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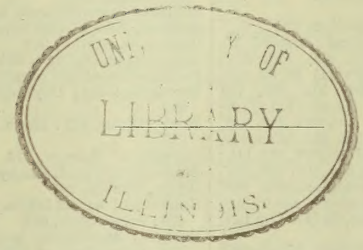

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THE BUILDING NEWS

AND ENGINEERING JOURNAL.

THE PAST YEAR.

THE year 1880 has not been memorable for the commencement of any important architectural buildings, though it has witnessed the progress and completion of a few, and has given us some ground to expect a return of prosperity in the arts of peace. Our retrospect must be confined to a brief and rapid glance at a few of the more important and typical structures which have either been projected or actually been commenced or finished during the year. Among our great cities which have contributed to architectural progress, Glasgow figured prominently, although not, as yet, to much advantage. The Municipal Buildings Competition, unfortunate though the result has been, has shown the capabilities of the architects of the North, while the streets of Glasgow exhibit, in such works as the Fine Art Galleries, by Mr. John Burnet, and the central station, the outcome of a Classical school in which the spirit of Greek and Renaissance are found united in compositions of a thoroughly grammatical form. Liverpool, also, has shown a rapid progress in her recent architecture, while Manchester, Leeds, Bradford, Ipswich, and many lesser towns have manifested, during the year, considerable activity in the substantial adornment of their streets by the conception and erection of edifices destined to play an important part in the intellectual advancement and culture of their citizens.

We have once more to record the progress made with two buildings of national importance in the metropolis. The Law Courts, during the past year, has been brought to such a state of external completion in its main features, that the public can now form a pretty accurate idea of the completed structure; and we think we are only expressing the consensus of architectural opinion when we say that, apart from the question of style, which will still remain a debatable one, the main frontage towards the Strand, as a vigorous Gothic composition, is unsurpassed in this country for play of outline, light, and shadow. In immediate proximity to this structure, the Temple Bar Memorial has lately been erected, in opposition alike to public remonstrance and good taste, another instance of corporate ambition and officialism, and the pertinacity which substitutes one form of obstruction for another. The completion of Mr. Waterhouse's building at South Kensington, destined to become the principal depository for the Natural History collection which has so long and inadequately found a warehouse in Bloomsbury, is one of the most notable incidents of the year, and as exhibiting a modern phase of eclectic Gothic, carried out boldly in a material of great promise, and combining scientific planning with decidedly effective grouping and colour, the building has special claims upon the architect. Of other buildings in London which have been completed, we may notice the Grand Hotel at Charing Cross, by Messrs. Francis and Saunders, a structure which, for size and internal completeness, surpasses any other similar building in the metropolis, and combines the peculiarities of the Continental and American systems, though, architecturally, its proportions and details are unsatisfactory. In the immediate vicinity, Mr. F. H. Fowler is engaged in the construction of a new theatre in Northumberland Avenue, and Mr. C. J. Phipps has been busy upon several new theatres in London and the provinces. We may mention a new one to be built at Dublin, another in Beaufort-buildings, and the remodelling of the Princess's in Oxford-street. On the Embankment, Messrs. Davis and Emanuel have commenced their new City of London Schools, though on a very different plan and design to that which received the premium. Mr. A. Blomfield has also prepared a bold Gothic design for Sion College Library—two buildings which will fairly represent, when finished, the Renaissance and Late Gothic, as applied to educational buildings. Other buildings are in contemplation here; there is the Grocers' Company's Hall, and De Keyser's Hotel is also in progress of enlargement, so that we may expect, before long, to see the Embankment a representative thoroughfare on a scale hitherto unattempted in London.

The adoption of Renaissance for the style of a new church of the importance of that of the Oratory now in progress at Kensington, from Mr. Gribble's design, is a noticeable feature in the annals of architecture, especially following the great ecclesiastical revival of Mediævalism; the new Synagogue and the Greek Church at Bayswater—the first from the designs of Messrs. Audsley, in a Saracenic style, and the last by Mr. J. O. Scott, in a Byzantine style—are also remarkable departures in style.

Architecture in the metropolis has received many important additions, many of which we have illustrated and recorded during the year. One of the most striking is Messrs. Child's new bank in Fleet-street, the architect being Mr. Gibson. In the City the new Mercers' Hall in Cheapside, from the designs of Mr. J. B. Williams, is a conspicuous structure, showing a florid treatment of Renaissance. The large frontage has been broken up by high roofs, and the architect has freely blended Italian with French and English details, in a manner that passes almost the limits of the extreme flexibility in the style. In Queen Victoria-street the New Post Office and Savings Bank, also by Mr. Williams, has been completed in a much more academic style of Italian, severe astylar, imposing in elevation, and eminently official. We may also notice another official work, the Bow-street Police Court and Station, in another type of Italian equally removed from the two former. Messrs. Ford and Hesketh have been engaged in reconstructing some of the business premises in Cheapside and Fleet-street, notices of which have appeared in our pages. A well-conceived building in what has been called the Neo-Grec style is Messrs. Boulnois and Warner's new offices for the Standard Life Insurance, now finishing in King William-street (lately noticed by us and incorrectly described as the design of Mr. Stanley, the clerk of the works); it shows how well this form of Classic can be adapted for business purposes, while the entresol and decorative details are worthy of attention. Messrs. Joseph and Pearson have been engaged in new premises on Ludgate Hill, for Messrs. Samuel, conceived in a very different spirit. We may mention also the new Telegraph Offices in London-wall, by Mr. Norton, in a rich French Renaissance; and some striking warehouses of the latter class lately erected in the neigbourhood. Mr. Vickery's building in Farringdon-street, lately illustrated by us, deserves notice for bold treatment in a Vernacular style; and in Long-lane Mr. W. Neve has erected a block of offices and warehouses, showing what may be accomplished by adopting Renaissance in brick and stone; we may also mention some warehouses at Pimlico, by Mr. Walford.

In the West-end rebuilding has not been at a stand-still. Mr. Waterhouse, for instance, has given us a practical example of what may be done in terra-cotta in his new corner block of shops and offices between Old Bond-street and Piccadilly, in a freely-

treated style. The New Bond-street Arcade may be cited as a striking commercial undertaking, and several buildings of the same character we have noticed from time to time. The new Vestry-hall at Kensington, by Mr. R. Walker, has been finished, and illustrated by us. St. Mary Abbott's Church has been finished by the addition of a fine spire, from the designs of the late Sir G. G. Scott; and in the Fulham-road the large red brick building erected from the designs of the late T. H. Wyatt, for out-patients in connection with the Hospital for Consumption, deserves mention for its handling, Knightsbridge Barracks, by the same architect, is another conspicuous work of the year, comprising two or three palatial blocks in which Suffolk red brick and stone have been combined in an Italian style. In Bloomsbury also will be found improvements. We have already recorded a memorial infirmary in an Elizabethan style, by Mr. Peacock, and the same architect's parochial schools near Little Russell-street. The new buildings in Theobald's-road have been making considerable progress.

The completion of the new school in connection with University College, by Prof. T. Hayter Lewis, being carried out under Mr. Tavenor Perry, deserves record, and the new wing will shortly be opened. Among other educational buildings of note we may also allude to Mr. Edis's new library, a building for which designs were made a few years ago by Mr. E. C. Lee, in conjunction with Mr. Curzon, Mr. Edis having succeeded the late Mr. E. M. Barry as architect to the Middle Temple. The new library will be in a Late Gothic style and of red brick. Mr. T. Roger Smith's Hospital for Consumption, Hampstead, must be noticed as a pleasing variation from the hackneyed type.

Municipal architecture has made considerable progress. The Glasgow Municipal Buildings Competition stands foremost among the leading contests of the year, though it has not yet resulted in a satisfactory decision. It illustrated the abilities and resources of some of the leading architects in Scotland and England, but the most memorable incident in connection with it is the mismanagement which marked not only the inception of the conditions laid down, but the final award, and which has resulted in general dissatisfaction to the competitors; so that at present a revised competition appears to be the only probable solution of the difficulty. The recent competition for the Pontefract Town-hall, and the Bermondsey Town-hall, may be mentioned here; among other works of the same nature we may name Dunstable, Kingstown, and Maidenhead, towns which have recently shown activity in buildings which may be mentioned in the list of important undertakings of this class. Of works which have assumed practical shape we may allude to the Ipswich Post-office, an ornate building, by Mr. John Johnson, now almost finished; the Corn Exchange, in the same town, just commenced, in an Italian dress, by Mr. Brightwen Binyon; and also the massive red-brick Queen Anne Museum and Fine Arts Club, from Mr. Horace Cheston's designs; the Wakefield Town-hall, a successful building by Mr. Collcutt, Mr. Corson's new offices at Leeds, the Reading Municipal Offices now in course of construction by Mr. Lainson, the Municipal Buildings at Hastings being carried out by Mr. Andrews, the borough surveyor; illustrations of all which we have given; the Eastbourne Town-hall, the competition for which has fallen through, with the result that Mr. Schmidt, the local-surveyor, is deputed to carry out the work.

The Liverpool School of Art competition, which has only recently been decided in the adoption of Mr. Cook's design, is still fresh in the memory of our readers, and seems to have created well-grounded dissatisfaction; we may name also the Birmingham Free Library competition; the Plymouth High School, by Messrs. Paul and Bonella (illustrated by us); the Hereford County Schools, by Mr. F. R. Kempson; the West London School of Art, in progress from Mr. R. W. Edis's design; the competition at Cardiff for a Free Library, and Museum and Schools, resulting in the selection of a design (illustrated by us) by Messrs. James, Seward, and Thomas, of Cardiff; the Bradford Technical School, by Messrs. Hope and Jardine, and the Manchester School of Art, now in progress, from the designs of Mr. F. Redmayne, both which have appeared in our pages; the University College, Bristol, by Mr. Hansom; schools at Hampton, by Messrs. Karslake and Mortimer; School of Art at Turnham-green, by Mr. M. B. Adams. The Hull Asylum competition is another important contest, decided in favour of Messrs. Smith and Brodrick, local architects; the hospital and asylum at Norwich, Lancaster Asylum, by Mr. G. E. Grayson; the proposed hospital at Sittingbourne, Mr. Grant's design; the Bolton Infirmary, the West Devon and Cornwall Hospital, the competition for which resulted in the design of Messrs. Coe and Robinson being selected (p. 220, Vol. XXXVIII.), may be mentioned. Mr. Sedding's unique Hospital of St. Mary at the Cross, Shoreditch; the completion of buildings at St. Peter's, London-docks, as a memorial to the late vicar, by Mr. Bowes A. Paice, must not be overlooked. The baths and washhouses at Manchester and Sheffield, by Mr. J. Johnson; at Salford, by Mr. Jacob; at Rotherhithe, and Richmond, by Messrs. Elkington and Son, are another useful class of building. Exhibitions of an instructive class may be represented by the large Panorama, nearly finished, in Leicester-square, and by another at Westminster, by Mr. Edis.

The Preston Railway Hotel, the competion for which was decided in favour of Mr. T. Mitchell, of Oldham, is in progress. Among competitions which have given general dissatisfaction, the Westminster Vestry-hall is conspicuous, and illustrates in a special manner the need for revision, contemplated by the Institute. The decision, after much squabbling, has been given in favour of Messrs. Lee and Smith's design. We also have to notice a contemplated hospital in Henrietta-street, Covent Garden, about to be erected by Mr. J. M. Brydon, and the completed infirmary at Bolton, by Mr. Knill Freeman.

Ecclesiastical buildings, if not so numerous as they have been, cannot be passed over. St. Mary's, Brighton, by Mr. W. Emerson (see illustrations, Vol. XXXVIII.); the new church at Bedford Park, by Mr. R. Norman Shaw, R.A.; the rebuilding of Hammersmith Church, by Messrs. Seddon and Gough. The churches at Burton-on-Trent, Hunslet, may be named, but the most conspicuous event in the ecclesiastical annals was the princely ceremony of laying the "first stone of the cathedral" at Truro, in May last. As we have published Mr. Pearson's design, it is needless to say more than that all English talent can do to render 19th-century Gothic worthy of an English cathedral, will be done. Spires are being added to the twin western towers and to the chapter-house of Southwell Minster, which is also being re-roofed and internally adapted for cathedral use. The upper stage of Gloucester Cathedral tower has been rebuilt. During the year, also, we have published Mr. J. Brook's fine design for the new Church of St. Mary's, Woolwich, and Mr. J. D. Sedding's interesting structure at Salcombe. We cannot omit to mention the progress made in the restoration of St. Alban's Abbey, and the fact that the new west front has been undertaken by an amateur architect (Sir Edmund Beckett) whose design we recently gave. The consecration of a large church at Leeds, the Hook Memorial, took place in the early part of the year, and may be placed on the list of typical examples of ecclesiastical art; it is by Mr. J. O. Scott, and was illustrated (p. 276) in last vol. There are to be cathedrals at Liverpool, Melbourne, Sydney, Hong Kong. Reference may also be made to St. Peter's, Plymouth, by G. M. Fellows Prynne; to some characteristic edifices by Messrs. Dunn and Hansom, especially their monastery near Canterbury, and to St. Oswald's College, Shropshire, by Messrs. Carpenter and Ingelow. Among competitions recently decided, the Raikes memorial church, Gloucester, must be mentioned, besides the building of a church at Tulse-hill; while in restorations, that of Bangor Cathedral, by Mr. J. O. Scott; the south transept of York, by Mr. Street; Ely Chapel, Holborn, and the world-renowned edifice of St. Mark's, Venice, claim notice. Mr. Street is also finishing the great west steeple, has remodelled the eastern turrets, and is restoring the fabric of the very interesting church of St. Peter's, Mancroft, Norwich. Congregational and other Nonconformist buildings of considerable merit have been completed and made progress during the time, though we can only refer to a few good examples of planning and design that have been given in our pages.

It would be impossible to mention even more important domestic buildings of the year, many of which we have illustrated, though we may remark that the Queen Anne and various vernacular varieties of Old English have supplanted Gothic as a general style for house-building. One of the most recent reconstructions is Mr. C. Barry's rebuilding of mansion at Clumber, near Worksop, the design for which formed a prominent drawing in last year's Royal Academy. Eaton Hall, by Mr. Waterhouse, has been fairly completed, and will rank as one of the most complete of modern ducal residences. The same architect is engaged on Haythrop Hall. Denton Hall, Grantham, by Mr. A. Blomfield, M.A., may also be named as an eminently satisfactory building in Late Gothic, an illustration of which has appeared in our pages.

The obituary of the year is a heavy one, and includes the following names:—Mr. Edward M. Barry, R.A.; Mr. Charles Lees, R.S.A.; Mr. Edward William Cooke, R.A., F.R.S.; Mr. John Parker, antiquary; Mr. Planché, Somerset Herald; Mr. Thomas Landseer, A.R.A.; Mr. Henry O'Neil, A.R.A.; Mr. John Cousen, the landscape engraver; Sir Thomas Bouch, C.E.; Mr. Benjamin Ferrey, F.S.A., Mr. Thos. Hy. Wyatt, F.S.A., Mr. Robert Hesketh, Mr. Wm. Penstone, and Mr. J. H. Hakewill, architects, and Mr. Edmund James Smith, surveyor; the Rev. Mackenzie E. C. Walcott, B.D., the well-known antiquarian and ecclesiologist; Mr. Matthew Allen, one of the introducers of concrete and improved artisans' dwellings; Mr. Josiah Wedgewood, the potter, and the Rev. Henry Moule, inventor of the earth-closet.

WINTER EXHIBITION OF PICTURES AT THE ROYAL ACADEMY.—I.

MANY are the gems, and fewer in proportion than usual are the inferior works, in this year's exhibition at Burlington House. The famous collections from which the paintings have been selected are amongst the very best in this or any other country. We may see upon the walls some of the finest pictures belonging to Lord Bateman, Mrs. Hope of Deepdene, Mr. Charles Butler, and the Earl of Strafford, besides large and first-rate contributions from the galleries of Her Majesty, the Marquis of Aylesbury, Mr. Bischoffsheim, the Hon. R. Baillie Hamilton, Mr. L. Huth, Lord Wimborne, and others. There are not so many

portraits as usual, but some are of extraordinary importance and merit. Of course, the Dutch school is fully represented. There is also an interesting series of the works of the Early Italian and German masters, including some by Raffaelle, Albert Dürer, Lucas Van Leyden, Giotto, Cima de Corneliano, Lucas Cranach, Francia, S. Memmi, and various early school pictures. One great feature of the exhibition is a vast assemblage of the drawings by John Flaxman, beginning with some of his first efforts. The original design for the Shield of Achilles not being procurable, the Academy have exhibited Stothard's drawing of it.

Among the portraits, we have this year several works by artists rarer or less known than what we generally see in the exhibitions. In the first room there is a spirited portrait by Hugh Robinson, representing Thomas Teesdale, of Malton, as a boy flying a kite. The colouring is excellent, but the attitude is somewhat exaggerated. By Francis Coles, R.A., there are two: No. 49, very elaborate in its details, but faulty in drawing, and mannered. No. 142 is far better in every respect; with the same care bestowed upon the intricacies of the ornate dress of the time there is less formality and great elegance. The ladies represented are the daughters of Frederick Prince of Wales. This picture and its companion, No. 133, come from Buckingham Palace. The three daughters of George III., Mary, Sophia, and Amelia, are represented by J. S. Copley, playing in a garden. There is a view of Windsor in the distance. All is done in a solid, praiseworthy style. The colours have stood extremely well. In fact, Copley did not try so many experiments with his materials as some of his contemporaries did, and as most of his successors have done since. Most of the portraits by Gainsborough are by no means representative examples. There is some fine colouring and good sound painting in his characteristic likeness of Wm. Pitt, No. 47, the property of Lord Bathurst. Pitt seems to have been something over thirty when this picture was painted; his features not being so sharply developed as in his later portraits. No. 172, "The Wood-gatherers," is one of Gainsborough's happiest and most beautiful inspirations. A young girl is carrying a pretty child in her arms, who is all life and freshness, while a little boy, holding up some sticks in his lap, is walking by their side, through a richly-wooded and hilly country. "C. J. Fox, addressing the House of Commons during the Ministry of Lord North," shows what the interior of the old House of Commons was like. Fox, dressed in blue coat, yellow waistcoat, and knee-breeches, addressing the chair, is the principal figure; the other members sit round in closer and better order than the house presents in our time. Most of the members sit uncovered, though some exercise the privilege of wearing their hats. It is altogether of value, both historically and for the variety of the costumes, no doubt as true to life as we know that of C. J. Fox himself to be. Nos. 42 and 50 are capital landscapes, the latter as good as possible; 42 is slighter, and less happily coloured. No. 41, "Family Portraits," is a fair specimen of Zoffani's work, interesting chiefly as giving an exact idea of the dress and manners of his time. Those who remember James Ward's portrait of last year will be glad to see one of himself, No. 48, which he painted in 1839, when he was in his 65th year. Of similar interest, but of less power and character, are J. Opie's portraits of himself, his mother, and father. William Hogarth put forth all his power when he painted for Lord Charlemont "Picquet, or Virtue in danger," No. 55. It was done, by request, just about the period that the artist had determined to devote all the rest of his time to engraving. The subject was chosen by Hogarth, and the price too was left to him. He got for it £100, with a pleasant letter expressing the impossibility of putting a money value upon such excellent art. It is worth noticing that it brought at Christie's, in 1874, £1,585. "A young lady" (the portrait is that of Miss Salusbury, afterwards Mrs. Piozzi) having played at cards till she has lost her money, watch, and jewels, is tempted by the young, good-looking officer with whom she has been playing to take them back in return for her honour. She is just wavering at his suit. The subject is treated with great power and less unpleasantness than one sometimes finds in Hogarth's works. Hanging close by them is a fine portrait by Henry Howard, R.A. (56), of Boisgelin de Cucé, Archbishop of Aix, who was a refugee in England at the end of last century. It would well bear comparison with the best of the French portraits of a similar character.

George Morland was never intended for a caricaturist. Pretty as some of them are, and graceful, nothing can be weaker and more mawkishly sentimental than the series of the progress of Letitia from innocence and happiness, through fall, desertion, and disappointment, to repentance. It was painted to engrave. The first of the series only exists in the print, that in the Academy being a copy from the print, made by T. Richmond, where Letitia, in a state of innocence, is at home, in a religious, decent family; in the second she elopes with an officer in uniform; in the next she returns, dressed in fashionable attire, and offers her father some of her present wealth, which, of course, he refuses with just propriety; then in the fourth she is being dressed finer still for a masquerade, while her admiring lover looks on with ravished sight. This is about the best in the set. The masquerade had been the climax; and in No. 5 we find her deserted, standing at a tavern-door, and apparently going on to the town—but that not suiting her, in the same dress (in No. 6) she returns to her home, a fair penitent, and is received by her forgiving parents. Morland could do bits of real country life better. H. C. Ames is the possessor of a capital little landscape, full of truth and vigour: no doubt what he had actually seen in the country. Those who admire power of vigorous expression will find it in the peculiarly repulsive portrait of Jan Steen, his wife, and children. Anything more vulgar, but evidently entirely true to life, it is impossible to conceive. He and his wife had been eating and drinking till they could stuff no more. Sleep has come to her relief; tobacco is solacing him. It is easy to see the sort of home such a man had—but he could draw better scenes. Mrs. Hope's "Christmas Party," No. 100, is a good natural work, entirely free from the utter coarseness of the former. He here faithfully describes a better station of life. Unlike D. Teniers, Jan Steen could paint a large picture as well and as perfectly as a small one. Here we have the interior of a well-furnished house, with guests making merry at a table in the distance, while the mother sits by the baby's cradle talking to the godmother, who is enjoying a glass of good liquor. Two other children, one, the elder of whom, is giving his brother a sly taste out of a flagon with a long spout, are splendidly painted. Nothing could be more masterly than Earl Cowper's "Oil Mill," by David Teniers. There is only a single figure, the master of the mill at his work, and no unnatural heaping up of utensils merely to show how perfectly he could represent them on his panel. We see throughout what this great artist could do with a single touch. This is a much better example of Tenier's technical skill than the larger and more pretentious "Worship of Bacchus." This picture is divided into two subjects: on the left is the actual gathering of the grapes and the process of treading out the juice and storing the wine; on the right is a temple raised to Bacchus, who is seated on a cask, from which flows the amber wine for the supply of a crowd of men who press forward to get it—naturally, some get too much. The value of Tenier's pictures does not always increase in proportion to the size. Mrs. Hope's "Soldiers Playing Backgammon" could hardly be surpassed. Its condition, as in fact is the case with most of her pictures, is unusually perfect. Many, we believe, have remained in the family from the time they were executed, and so have escaped the frequent cleanings and repairs which are undergone by those which have often passed through the hands of dealers. The companion picture, No. 66, though on copper, is as fresh as when it left the painter's easel. "Corps de Garde," belonging to the Hon. R. B. Hamilton, is a study of armour and other military accoutrements heaped together, the figures of the guards playing in the background being merely auxiliary. Frank Hals is always good, as is shown in the only picture by him, No. 59, "The Merry Comrade"; Mr. Bischoffsheim is its fortunate owner. We have seldom seen so grand and scholarly a picture as the "Landscape with Horsemen, &c.," by P. Wouvermans, painted in 1653. It is a splendid composition. In the foreground, there is a village by a river-bank, *en fête*, with groups of people merrymaking, dancing, drinking, and fighting, men and boys jumping into the water off a barge, and no conventional white horse. Miles away, the eye passes over a grand landscape to the hills beyond, the plain being dotted with buildings and towers. The atmospheric effect is marvellous. The canvas measures 27in. by 43½in. This is by far the best picture by Wouverman in the collection. Mrs. Hope however, has a very charming one, smaller, and more in his ordinary manner. The subject is a village merrymaking—the merriment being in certain cases not altogether wise. One of the prettiest features is the accurate and beautiful drawing of the birds, which are flying about or feeding in front of the public-houses. It is strange that so elegant a painter should condescend to such coarseness as disfigures a small part of this graceful picture. Gabriel Metzu may be seen in the three examples, all belonging to Mrs. Hope, in greater perfection, we fully believe, than in any other collection. Perhaps the most wonderful is No. 127, a gentleman in black dress, writing. It is admirable for the harmony and contrast of colour, the clever management of light and shade, and faultless drawing. There is more movement and life in No. 125, in which a servant is drawing a green curtain over a sea-piece in grisaille, which is hanging on the wall, while her mistress is reading a letter she has just received. No. 130 is also an interior of a room, in which a lady is seated at a table writing a letter, while a gentleman, apparently unseen and in no too amiable a mood, is looking to see what she writes. There is a good deal of character in the faces. There are some pretty, but not important, sea-pieces by Wm. Vandevelde.

THE GROSVENOR GALLERY.

THE Winter Exhibition at this gallery opens with a superb collection of decorative designs, in which the rising school of younger painters is largely represented. To the decorative artist and architect the value of this feature in the present exhibition is very important, and we direct special attention to it. These works fill the vestibule and east gallery, the leading artists

being Mr. E. Burne-Jones, who alone exhibits no less than nineteen drawings and cartoons; Mr. Walter Crane, Mr. H. Holiday, Mr. L. Alma-Tadema, R.A. Mr. W. B. Richmond, Mr. E. J. Poynter, R.A., and Mr. W. J. Muckley. It is as a newly-developed taste and as the beginning of a new school of decorative design, that we desire more particularly to call attention to these works, and not because we think they are destined to have a lasting influence upon art. As illustrations of what the high-art school deems to be the ideal of decoration, Mr. Burne-Jones's collection may be taken as the best examples we have. To mention these, we may first notice two pencil cartoons entitled "Design from Romance of the Rose," a subject taken evidently from the poetical allegory of the 13th century under that title. Of the first drawing we cannot say much for the composition, and the lower limb of the left-hand figure is evidently faulty in drawing about the knee. Taking it, however, as a work by a consummate and daring artist, whose aim is to transcend the received canons of art as handed down by Raphael and his followers, we must acknowledge the design is powerful and poetic, notwithstanding the perverse ideas it exhibits; the companion picture is both more correct as a drawing, but there is nothing in it the most academical critic could find fault with, and the pencilling is freer and the drapery more graceful and flowing. In both drawings Mr. Burne-Jones introduces that particular type of angelic countenance which mark all his works. "A Sea Nymph" (326) is a conventionalised nymph rising out of a rough sea of deep bluish tint. We could hardly have thought Mr. Burne-Jones would have painted so thoroughly hackneyed and crude a type of decoration. The companion picture in oil, "A Wood Nymph," is far more original: it represents a lovely face and half-concealed figure, with streaming hair, intertwined with the branches of a tree, and is in every way more in keeping with the artist's poetic imagination. In another subject, "Cupid's Hunting Ground," we have an example of decorative treatment in *gesso*, a species of modelling or bas relief that we have had occasion to refer to before in these pages; Mr. Burne-Jones has here produced a panel in which cupid and wood-nymphs are represented in colour, and with all the metallic lustre of bronze and gold; we might almost mistake the work for a low-relief bronze; but it would be extremely uncomplimentary to liken it to embossed leather-work. But we turn from this group of the work of the artist to another which occupies the end of the gallery. Chief and central among this is "Dies Domini," a circular picture in a decorative key of colour, representing Christ seated in clouds of azure, amid ranks of angelic beings, whose faces are of seraphic expression and beauty. The colouring, intensely bright ultramarine, the clouds of winged angels, and the treatment of the drapery, place this work in an essentially decorative class, and a devotional feeling of the highest order pervades the composition. As a scholarly and a refined abstraction in colour, a subtle conception of a religious subject, a long way removed from the ordinary conventions of the artist, this picture or panel holds a high place. The design from the "Song of Solomon" (339) is a large decorative cartoon in outline, in blue, green, and brown; though very rich in composition and accessories, offends one's sense of grace by the stiff and straight figure which, in mid air, is thrust across the picture. The whirls of hair or drapery, unique in Mr. Burne-Jones's works, are introduced with a weird-like and cunning power, and the whole bespeaks a poetic sentiment. "Elijah" is a life-size study of the prophet, massively painted in a style which is certainly not marked by any of the later manifestations of the painter's work, but not on that account less successful; indeed, it may be thought to be the most sober of the many figures; there is a grandeur in the conception of the attitude and drapery. We next come to a design for "Part of a Window" for Brampton, a more recent performance. It is shown in three full-size compartments, and is executed in coloured crayon; but the most remarkable of the works of the artist are those numbered 353, 356, designs for glass windows. "The Judgment," designed for East Hampstead Church, is a grand composition in colour and crayon, executed as full-size cartoons in three compartments. In the colouring a low key is chosen, exquisitely harmonious and decorative. Of the design it would be difficult to speak with the same admiration. Of course, in estimating this and the other compositions of the artist, the observer must bring his mind and imagination into a fitting vein; he must cast aside all preconceived notions of the works of the great Italian masters of the Renaissance school, to whom he has always looked for models, and must try to realise somewhat of the subtle sentiment and poetic mysticism which mark the conceptions of that intense religious and pre-Raphaelistic school of which the author and Mr. Gabriel Rossetti are the leaders. When in this frame of thought, the "Judgment" and "Paradise," "Two Groups of Angels," the latter a design for a window in Salisbury Cathedral, may be fairly appreciated. No one can deny the subtlety and delicacy, the poetic symbolism, and the depth of reverential feeling which pervade these compositions; the figures are essentially the same in attitude and expression with those we had in the same artist's "Annunciation" and the "Golden Stairs," of previous years; the faces are all of the type as in every other of the subjects exhibited—a love-lorn, saddened countenance, with deep-set eyes, and broad intellectual foreheads; the draperies full of small stiff folds. The "Two Groups of Angels" are heavy in the drapery of the figures. Four smaller designs are shown for subjects for the predella of a window.

We may now cast a glance at a few other decorative works, remarking that they exhibit a great divergence in style and sentiment. In the vestibule, Mr. J. E. Millais's "Design for the Tracery of a Window" (319), is an unfortunate instance of a celebrated painter attempting to give us his notions of architectural design. That it possesses originality is all that we can say in its praise. The conception of the artist consists in introducing the figures of angels into the curved lines of the tracery. Thus the two lower lights have pointed arches formed by angels meeting together, face to face, at the apex of each, and their bodies or wings forming the sides of the arches, clasping hands a little below, while the quatrefoil filling in the head of the window is similarly formed, the upper cusps being indicated by the hands and arms of the embracing figures. Although a full-size cartoon, the conceit is not clearly worked out, the modelling, light and shade, especially in the wings, being imperfectly shown. Mr. Walter Crane exhibits several designs; the least meritorious, in our opinion, is the "Design fer a Chimney-piece" (322), where an exceedingly heavy composition rests upon pilasters of bad proportion, to say nothing of the weak bases and detail. "The Sleeping Beauty" (332), a cartoon for a wall-paper, is pretty in design and drawing; in the tendrils and apple-blossoms the Sleeping Beauty is introduced, and the colouring is happy. Above is a large cartoon, "The Fates," for needlework, displaying some clever figures. The cartoons for nursery wall-paper, and the designs for encaustic tiles (302-304), representing, outline, emblematic figures of the hours of the day, four seasons, and nursery-rhymes, are cunning in scheme in a low scale of colour; but the most striking designs by this artist are "The Goose Girl" for tapestry, and the "Design for Frieze" (336-337); the first, a large composition of quaint design in water-colour, and the second a crayon study of three female figures in pale tints of green and red, resembling the "Graces," are enveloped in flowing drapery, and display considerable grace in the outline and grouping. "Earth, Air, Fire, and Water" is also an emblematic composition, with animals introduced in the branches of a central stem, but it lacks repose. Mr. J. H. Pollen shows a too naturalesque treatment for a painted ceiling; while Mr. L. Alma-Tadema, R.A., in his spirited and highly-finished monochrome tempera studies, "Mars and Venus," and "Bacchus and Silenus" (330, 331), are scholarly productions on a grey paper, evincing much decorative and poetic value and suggestiveness. Also chaste and classical in sentiment is Mr. H. Holiday's "Design for a Frieze in Clifton Cathedral," in crayon; the light red dado sets off the figures of Apollo and the Muses. Mr. W. J. Muckley's decorative panels, and Mr. E. J. Poynter's design for Mosaic in the House of Lords, the latter St. George with allegorical figures of Fortitude and Purity, are also conceived in the typical academical spirit, and are noticeable as examples of a very different class of decorative work to that we first alluded to.

We must now very briefly notice a few of the more important water-colour pictures in the large gallery. As usual, Sir Coutts Lindsay has brought together a number of the works of French artists, remarkable for vivacity of style, colour, and sparkle. We may mention "Sur la Terasse," a lady in low dress reading in her garden or terrace, by G. Van den Bos; a clever sketch of tramping sportsmen in the rain, by H. Harpignies; "Rotten Row," by E. Hoetericks; "Barques pres de Rouen," by C. Lapostolet; "Au Pont Royal," by N. Goeneutte, a brilliant sketch, No. 11, and the exceedingly sparkling and vigorous flower pieces, No. 16; "Marche aux Fleurs à Nice," by H. L. Scott and N. Goeneutte; No. 17, noticeable for the energetic drawing of the figures. The picture called "Abraham" (22), by J. Cazin, is handled in a broad style, vigorous in touch; but the treatment of the Patriarch's trial is rendered rather ludicrous by the angel who is rushing down hill to arrest the sacrifice of Isaac. A fine bit of colour, evincing much feeling, is "Gros Temps" (25), by U. Buten, and the brilliant sketches by A. Edelfelt; G. Haquette (31), a clever figure-study, wonderfully true to life, and the pieces by P. M. Beyle (33), L. Gaucherel (34), and the clever pictorial idea No. 36. The collection will repay study, as illustrating the very different sentiment and handling of the French to our own artists, and among the collection not the least noteworthy are the truthful drawings by E. Viollet-le-Duc, one "Sommet du Glacier de Scherzemberg," and another "La Montée au Chapeau." The gallery contains also several contributions from the Liverpool Society of Painters in Water-colours, numbered from 39 to 66. One of these, "Un Coin de Cuisine," is a highly-finished study from still-life, by Mrs. Pauline Walker; "The Edge of the Moor," by F. W. Hayes, is a conscientious rendering of a rocky-foreground and spring, and in a very different manner, and decidedly pre-Raphaelesque is Mr. J. M. Southern's "Reedy Pool by the River." The school of naturalists is well represented in such works as W. Pilsbury's "The Waggon" (51), a quiet pastoral scene of a farmhouse admirably drawn and grouped, highly

finished and skilful in the subtler charms of colour and shadow; and in J. Knight's "Hay Time," a fine broad meadow, illumined by a gleam of sunshine. "The Mill at Rest," by J. W. Walker (55), is a fine bit of execution; and C. Potter's "Drenched," a herd of sheep being driven over an open moor in a drenching rain, is full of freshness, exhibiting a keen sense of colour and atmosphere, and one of the best works of its kind on the wall. For rich landscape effects, A. Hartland's "Near Barmouth" justifies the position it occupies; the flat and upland are very truthfully rendered in both drawing and colour, and we must also remark T. Huson's broadly-handled landscape, transparent in colour, "A South Country Common," such as we may see in Wiltshire or Hampshire; and Walter Severn's "Windy Day" (67). W. Laing has depicted a poetic incident from the Greek in No. 61; the reposing figure is well drawn, and the accessories and colouring in quiet harmony. "A Dutch Vrow," by J. S. Morland, is a truthful study of life; and R. Beavis's "Study at St. Just, Oise" (71) must be noted as a spirited sepia sketch of agricultural life; so also the same painter's view of Portsmouth (75) is forcible and truthful. For exquisite finish and delicate handling the solidly-painted studies of "Water Lilies" and "Christmas Roses," by W. J. Muckley, cannot be surpassed. Domestic incident is quietly told by E. G. Kilburne in "Home Again," where a young naval officer or cadet is seated near his affianced at an *al fresco* tea-party. The verandah and distance are depicted with much truth. We cannot admire the "English Landscape," by J. W. North; the church and distance are feeble in drawing; but we must bestow well-merited praise upon W. E. Lockhart's fine view of "Durham," which occupies the place of honour. The stately position of the cathedral as it rises from the river and misty city enveloped in smoke, has been skilfully depicted by the artist, who has brought the resources of his pencil and technical handling to the task; nothing can be more truthful than the manner in which the cathedral and rising background emerges out of the mist and smoke which hover in the valley and over the tile-roofs of the city. Near this P. R. Morris, A.R.A., contributes two pieces "The Parting" and the "Bridal Morn," (115 and 116). There is a poetic sentiment in the sailor and his bride by the seaside, and the subjects sustain this artist's power as a delineator of sentimental incident. We can only scan the lovely flower-pieces by Mrs. Naftel (119), and J. D. Linton's (124); E. M. Wimperis's clever sketch "Wet Sands" (121); J. S. Hill's broadly coloured "Meadow" (123); W. B. Gardner's woodland piece (126); G. Clausen's "Sunday Morning." In massive handling Jules Lessore gives us a fine and vigorous sketch in light and shade of the "Entrance of Ducal Palace, Venice" (128); while the cattle, farmyard, and atmosphere in A. F. Grace's "Incense Breathing Morn" is something more than a natural transcript. As a genuine water-colour sketch, Clem Lambert's "View of Winchelsea" (131), possesses a merit which few of the modern school of water-colour can boast in their work—a freedom from the artifices now so much in vogue.

A few architectural drawings are exhibited which we must not pass over. "Old Houses on the River, Norwich," is a capital subject, but Mr. Barwell's drawing is hard in colour. Newton Benett gives us a peep of a picturesque bit, Audsley House, Salisbury, brightly coloured and highly-finished; but the work of the season in this room is Carl Haag's fine drawing, No. 154, showing a caravan of Bedouin near the Sphinx of Ghizeh during a sandstorm, remarkable for power of drawing, the fine colouring and technical qualities displayed in the sand-laden clouds. Lennard Lewis has a picturesque sketch of Rue de l'Horloge, Dinan, Brittany; Walter Crane, a well-executed drawing of the Elizabethan Gateway to Blickling Hall (164); R. R. Holmes, a drawing of the "Gates of St. Mark" (195); while in the small water-colour gallery, J. O'Connor's "Studies in the Tower" (197) and his "Sketches in Berne" (267) make a series of very pleasing fragments of old architecture faithful in drawing and neatly finished. One of the best architectural sketches is R. P. Spiers's House of Jacques Cœur, Bourges, executed in sepia and grey. We must also mention A. F. Payne's drawing of the Crosby Tomb in Great Helen's Church (263), J. Fulleylove's pleasing views of Baptistery and Piazza del Campo, Siena; A. Severn's "Amiens Cathedral" (231), and J. Pedder's "Durham."

We can only mention the names and numbers of a few other productions: by C. J. Lewis (134), E. F. Brewtnell (140), J. Syer (122), E. J. Poynter, R. A. (101), Guido Bach (157), Miss Phillott (150), G. G. Kilburne (158), A. C. H. Luxmore (159), Fairfax Murray (165), A. Parsons (169), Mrs. Carr Hastings (174), Walter Severn (178), Lady Lindsay (179, 180), C. Whymper, Miss Kate Greenaway (224), J. A. Smith (234), J. Orrock (238), G. Lucas (243), J. Aumonier (253), G. W. Cook (255), Miss Chase (266). In the sculpture gallery a few—A. Fussell (273), R. Spencer Stanhope (286), J. C. Robinson (275), and in the vestibule E. E. Morland's French Studies (287, 288), a charming stretch of deep blue sea and sandy beach, by Galafre (293), and some flowers by R. Revoire. H. Holiday shows also two clever decorative studies for reredos and window in Nos. 311 and 312.

THE STUDY OF THE BEAUTIFUL.*

"DIFFICULT are the Beautiful." In Plato's Dialogue, called "The Hippias Major," Socrates says to Hippias, "A certain person has very lately (during some conversation) thrown me into a difficulty. I was finding fault with some things as being ugly, and praising others as being beautiful, when he asked me in a very saucy manner, 'From whence do you, Socrates, know what things are beautiful and what ugly? Come, then, tell me in a word, What is the Beautiful?' and I through my want of wit was at a loss, and had it not in my power to answer him with propriety." Hippias seems to think that there is nothing easier than to answer the question, but Socrates baffles him at every point, and in the end winds up by quoting the ancient proverb, "Difficult are the Beautiful." Hogarth, in his "Analysis of Beauty," says: "Though beauty is seen and confessed by all, yet from the many fruitless attempts to account for the cause of its being so, inquiries on this head have almost been given up, and the subject generally thought to be a matter of too high and delicate a nature to admit of any true or intelligible discussion." Having read these passages over two or three times, I began painfully to realize the responsibility I had undertaken in venturing to give a lecture on the Study of the Beautiful; when it struck me that, although the Greek philosopher could not, or pretended that he could not, answer the question, What is the Beautiful? yet the Greek sculptor, and even the humble potter, could show it to us; and, therefore, may I be allowed to suppose that Art is the real language of the Beautiful, and that in which it can best express itself; since it is a universal language, and one whose syllables and phrases are the very forms of beauty, and not doubtful words and difficult logic, that a very small portion of the human race is capable of understanding. And besides which, it always seems to me that the philosopher shuts his eyes to look within himself for the Beautiful and for truth. But the artist must open his eyes very wide, and his mind's eye also, and look all around him everywhere in search of it, and then tell us as much as he can about it in his own visible language. Nor is there that antagonism in real art that there is in speculative philosophy. All great art, of whatsoever time, is alike in spirit, and even, as we shall see, in form, for it is founded on the study of nature. And although we no longer consult the Delphic oracle, nor worship in the temples of the gods, we still admire the Apollo Belvidere, the Venus of Milo and of Medicis, and all fine Greek and Greco-Roman sculpture. Many of the ancient creeds and dogmas have passed away, but the art which was employed to illustrate those creeds, where it has survived the destroying hand of man, and wherever it was founded on the study of nature, still remains, and is still loved and admired. No beautiful art can exist unless it is founded on the study of nature, nor can we even appreciate it unless we know something of her laws, for these are the foundation of all the laws of real art, and must be studied in order to acquire an appreciation of the Beautiful in art. And it is especially this appreciation and knowledge of art that I wish to call attention to, for, without it, art would indeed be solitary and of little use, and without much chance of progress, if her secrets and her beauties were only known to be to the few; they should be known to everybody as far as possible. Not that everybody should practise the art, that is neither necessary nor possible; but if the public generally know nothing of its principles or elements, and are obliged to be told by a friend, or to look into the newspapers, to know what to admire, then art has no mission. And it is like having picture exhibitions for the blind, and concerts for the stone deaf; nor is it difficult to see how disadvantageous this state of things must be to the art itself. If an artist who has to earn his bread like any other worker, finds that the art he may put into his picture is not likely to be appreciated, then he will be tempted to neglect that very thing which alone gives real value to his productions, and think only of how to catch the eye and tickle the fancy of the wealthy purchaser, and thus the art gradually degenerates until finally it is lost altogether. Possibly we might trace the causes of the rise, the progress, and the decline of art at different periods of its history to this external influence, and if so, then I trust I am not indulging in a vain hope or a mocking dream, when I say that it seems to me that there is a great and increasing desire in the public mind at the present time for beautiful things, be it in painting, sculpture, architecture, or in the manufacture of the common articles of daily use, and that therefore we may look forward to a great and increasing supply of beautiful art in all its various branches.

By the Study of the Beautiful, I understand the seeking for the beauty and goodness of things as opposed to looking for their faults and their badness. For one who can perceive and appreciate the beauties of a fine work of art you have a thousand who can find some fault with it. For one who seeks out and studies the kindness, and goodness, and beauty of humanity, you have a thousand who can talk only of its wickedness. Now although there may be some sense of justice in this, I take it rather as a sign of an absence of the capacity to perceive beauty. No doubt it is right to expose the faults—to be unduly lenient towards them is erring in the other extreme, but it is wicked and unjust to conceal and wilfully to ignore the beauty and the goodness. Which of the two is the most wholesome food for the mind, goodness or badness? Which is the most productive and beneficial? A great artist or a great poet stores his mind with every beautiful object that he sees in nature and in art, with all the good deeds and kind thoughts that he believes his fellow men are capable of, and then makes it his study to show them to the best advantage to the world. Surely the minds of such men must be full of joy; for the reflections of their minds in their works, produce those pictures and those poems which are the delight of ages. Not for a moment do I mean to say that beauty is all sweetness; it has its terrible aspects as well as its joyous ones. Ophelia is beautiful in her sorrow, beautiful in her madness, and beautiful in her death. And as in music there are certain discords which conduce towards the harmony of a piece, so in art there must be some ugliness, some dark shades and rigid lines to enhance the value of its grace and beauty,—as the dreary days give value to the joyful ones, the storm in its rage makes the calm seem all the more peaceful; as the darkness

* A paper read by GEORGE ADOLPHUS STOREY, A.R.A., at the London Institution, Finsbury-circus, Dec. 30th 1880.

of night makes us rejoice in the return of morning. Note how often the most tragic subjects have formed the most beautiful themes for art and for poetry. It would seem that the very grief of humanity was that which wrung from the poets and the painters some of their most beautiful conceptions, and this, perhaps, is because, only under the great and severe trials of adversity does the whole strength and beauty of the human character make itself manifest—all its energies are roused, and the passions are excited to the uttermost. Then it is that we see one of the elements of human nature most flattering to our hearts—and that is self-sacrifice. The brave soldier leading on the forlorn hope with almost certain death before him; the captain of his sinking ship the last to leave her; the lifeboat manned with volunteers risking their own lives to save a shipwrecked crew. Let us consider that our minds are like bookshelves, on which we can only stow away a certain number of ideas. Now shall those shelves be occupied with the marvels of nature, with pleasant and true wisdom, with mirth and laughter and innocence, or shall we ile them up with the records of men's villany, he scandal of society, and the morbid reflections f the pessimist? In other words, shall we occupy ourselves with the study of the beautiful, or the study of the un-beautiful? Of course we must take heed of both, for one is the light and the other the shade; we must study both, and then confess that the light is the most beautiful.

Now it is very natural that the first question which will arise in your minds, is this: in what does the beauty and goodness of things consist, and in what their badness? The subject has already been so magnificently treated by a great living author, Mr. Ruskin, that I feel little, if anything, can be added to what he has most beautifully said, and I have not any doubt that his works have conduced to a very great extent towards that desire for beautiful things, and that improvement in taste which we have noticed as characterising the present time. It is well to have something to think about, besides the routine of business and the every-day affairs of life, and in this question, "What is the Beautiful?" although we may never be able to answer it quite satisfactorily, any more than the alchymist could discover the philosopher's stone, still it is one that will always give delightful and profitable occupation to the mind, and perhaps help towards the solving of other difficult problems and vexed questions. The alchymist in his endeavours to find a means of turning every metal into gold, although he did not succeed in that, discovered instead, and advanced, the most valuable science of chemistry. And so also with the study of the Beautiful, although man in his efforts to attain to that perfection which is unattainable, and therefore he can never be said to have discovered the quite Beautiful. Still he has discovered in the same way that the alchymist did the noble arts of architecture, sculpture, painting, poetry and music, and we may take all these fair sisters as forming a group of very great loveliness, imperfect only because it is the work of man. If the alchymist had discovered a means of turning every metal into gold, then he would in reality only have discovered how to make gold itself actually worthless. And perhaps if we were to discover some one thing that was admitted by all, and scientifically and undeniably proved to be the one and only thing of Beauty, then our efforts to do more must cease. The architect must lay down his compasses and his rule; the sculptor his chisel and his mallet; the painter his colours and his brushes; the poet his lyre, and the musician his scales, and his chords, and his harmony. So perhaps it is better for us still to be as we are; for us still to be endeavouring to find out more of the Beautiful, and to continue its study, which is an ever going forwards—and of ever-increasing interest.

We have in the present instance, chiefly to consider Beauty, as shown in the art of painting. We have to consider the drawing, the composition, the subject, the expression, and the execution of a picture. Beautiful drawing consists in exactly expressing the form and the nature of the object to be drawn. If it is a leaf or a flower, the drawing should be light and delicate. If a branch or bough of a tree, it should be firm, and free, and springy; if of rocks, it will be decided, perhaps hard; if of the human form, it should be firm yet flexible; if of drapery, it must possess a freedom, a loose quality, according to the nature of the material of which the drapery is composed; if of the face and expression, then the utmost delicacy and refinement is necessary. So we see in the first place, how a good draughtsman suits the handling of his pencil, or his brush (for painting is only drawing with a brush full of colour) to the nature of the object he is drawing; and hence we perceive that beautiful drawing is not a mechanical process, but a mental one. Bad drawing is merely mechanical; a bad draughtsman takes no pains to distinguish the character of one thing from another; there is no expression in his work, it is clumsy, without thought, and of little value. But in nature's drawing there is a meaning in every variation of her outlines—she seems to have to think about it a good deal—if she is drawing a bough of a tree, she makes it start away from the stem, with a bold curve outwards, and generally upwards expressive of the strength that will be required to bear its burden of leaves and fruit, &c.; and then perhaps, it has to fight its way through other boughs and branches, and a sort of struggle for existence goes on, and yet in very good fellowship, the different boughs turn aside, and aside again, to accommodate themselves to each other in a polite way, as if they were saying, "After you sir," and so, by many gentle curves, and delicate turns, and a running straight forward when they can get a chance, their whole idea and intention being to get as much light, and air, and moisture as possible. And thus nature, from the very necessity of the thing, from its very fitness or adaptability to its purpose, founds her art of beautiful drawing. Mr. Ruskin tells us that "Graceful curvature is distinguished from ungraceful by two characters: first, its moderation—that is to say, its close approach to straightness in some part of its course—and secondly, by its never remaining equal in degree at different parts of its course." He further tells us—"that this variation is twofold in all good curves: there is first a steady change throughout the whole line from less to more curvature or more to less, so that no part of the line is a segment of a circle, or can be drawn by compasses in any way whatever." Thus one example is a bad curve, because part of a circle, and is, therefore, monotonous throughout; another is a good curve, because it continually changes its direction as it proceeds. Now, in this Greek vase, we have an instance of how ingeniously man can adapt, and mould the great truths of nature to the purposes of art, and here we have an epitome of good drawing. If we carefully study all the most beautiful forms of nature, or let us for the moment call them the most pleasing; we shall find that their outlines, though varied and distinct, have certain qualities which are universal; there is an emphasis more or less great in all beautiful curves, sometimes it is again but faintly echoed, but these characteristics are invariable throughout nature in all her important works, and here in this Greek vase you have them distinctly idealised; here you have the classical rendering of the characteristic of nature's outlines, and therefore I call it a beautiful thing. But nature is not content with drawing one beautiful line, she must draw another also beautiful in itself, which shall, by its contrast, show off the beauty of the other one, and herein lies the great prevailing law of the Beautiful in art, that each part of a work is designed so as to advantage the rest, and it would be well if this could be carried out in life; at all events, this is the great doctrine of true art. The straight line and the circle enter largely into the composition of beautiful designs, although it is said that they are not beautiful in themselves on account of their monotony. But the straight line steadies every composition of other lines, and gives value to beautiful curves, for it shows off their grace by contrast, and the circle is an exact foil to straightness, and when judiciously introduced, as in architecture, gives in its turn great value to the straight lines and square forms of a building. The fret patterns, which are favourite Greek ornaments (here they are on this vase), show us the beauty of straight lines. Straight lines vary only in length, and this key pattern gives us that variety in a beautifully proportioned figure. It pleases us on account of its unity, and its variety (two of the great laws of the Beautiful) and because it brings out the one quality of infinity which straight lines possess; namely, variation in length, and note that the frets are not square but oblong, and therefore capable of a greater degree of variety; and this again is broken at intervals by a square and a different pattern sometimes containing a circle showing the value of contrast, which is another of the great laws of composition; and note that being on a round surface each fret appears to decrease in length as we follow it round the vase, which again increases its beauty by gradation. If we study the celebrated Campanile at Florence by Giotto, we shall see how exquisitely beautiful a design composed of straight lines may be made by an artist of taste. There is much more to be said about drawing and composition, and about the laws of principality subordination, repetition; the law of curvature, as used as a leading line to guide the eye through the picture, or as a bounding line in the placing of the objects; the law of radiation or springing from one root of contrast, &c., for which we have no time now, but which cannot be better explained than they are in Mr. Ruskin's Elements of Drawing, a most useful but I am sorry to say a very scarce book.

(To be continued.)

VENTILATION AT THE CUSTOM-HOUSE.

AN important application of the principle of ventilation introduced by Robert Boyle and Son, of Glasgow and London, has been recently made in the "Long room" of the Custom House, in Thames-street, and a series of experiments to test the efficiency of the system are being made, the results of which, as far as we have tested them, are very satisfactory. The new ventilators have been fixed under the direction of H.M. Office of Works in the above-mentioned room, an apartment measuring about 200ft. long by 64ft. wide, and 54ft. in height. From the experience of those engaged in the long-room, numbering between 400 to 600, the atmosphere before the new system was applied was insufferably oppressive and warm, and we hear from two or three of the clerks themselves that they often suffered from headache in consequence. The only outlet for the heated air provided were the windows at the extreme ends of the room, below the ceiling, and the windows in front, aided by the opening of the doors, and the only inlet a large iron grating in the floor, which admitted the foul air of a room below. The room is divided into twelve bays by pilasters, each having a large window facing the river. Under these windows, in the recesses formed between the pilasters, now used as cupboards for the clerks, inlet-openings have been made, leading into wooden air-trunks about 12in. square, which at the ends are carried up as vertical tubes, as in the Tobin system. These are left open above the heads, and are covered with perforated zinc plates. There will thus be 12 pairs of these openings on one side of the room, giving a large admission of fresh air from the most desirable side. Along the ceiling, at the crown, a wide single span vault, constructed of iron ribs and plates of an elliptical form, six circular openings have been made for tubes 18in. diameter, which pass through the roof, and are provided with six of Messrs. Boyle's air-pump ventilators, which act as exhaust shafts. Examining these in the roof, we found a decided up-current in each, although the galvanised iron-tubes were of the large area of 18in. diameter. These tubes are not carried straight through the ridge, but have a bend, the ventilator being fixed a little on the leeward side. Facts are worth more than theories, and it is one of the best recommendations of the system we have mentioned supported by those engaged in the room, that, since the introduction, the room has become more pleasant to work in, and the feeling of oppression has not been experienced. Architects interested in the subject, and there are few that are not, cannot do better than test for themselves the action of the system, as applied to one of the largest public rooms in London.

DETAILED DRAWINGS OF PIPE SEWERS AND MANHOLES FOR STEEP GRADIENTS.

WE have received a copy of a supplemental sheet, published under the direction of Mr. Robert Rawlinson, C.B., chief engineering inspector to the Local Government Board, containing typical plans and sections of manholes on pipe sewers having steep gradients, for the use and information of engineers and others having to deal with the drainage of towns under

those conditions. The sheet now before us details a variety of applications; the principal point however illustrated is, that the incoming sewer is placed its full diameter above the outgoing sewer from the manhole, the object of this arrangement being the prevention of "back-watering" of the branch sewers until the main sewers are running full, a frequent cause of stoppage of house-drains and deposit. In other respects the manholes are precisely the same as those illustrated in sheet 1, in the former instructions issued by the Local Government Board, though the manhole covers are shown circular, having wood bedding plates and blocks to prevent jarring. Six different forms are illustrated in the sheet "No. 1A," which we may briefly describe for the sake of those who may not yet have obtained this sheet. Distinguishing the sections, we refer to the figures. Fig. A shows plans and sections of a manhole at the junction of two sewers entering into a pipe-sewer at right angles. There is a sluice-plate shown that can be raised or lowered by a chain from the top. The sluice is 21in., and an overflow is provided over the top of plate to prevent the filling of the manhole; by these arrangements the flow of sewage-water can be stopped back and be let off suddenly to flush the sewer. The brickwork of the manhole at the bottom and round the pipes is surrounded by about 6in. of concrete, and the top of manhole is reduced for the cover by sailing-over the brickwork on three sides. Fig. B shows a similar arrangement of manhole, with an 18in. sluice at a single pipe-sewer junction, the outgoing sewer or outlet, as in the first case, being placed so that its crown is about level with the invert of inlet. Fig. C is adapted for a manhole with 15in. sluice, and Fig. D for a 12in. sluice. The next illustration, Fig. E, shows plans and sections of a manhole with an overflow, for the purpose of relieving sewer from storm-water; in this case the relief-pipe is shown nearly 9ft. above invert of sewer; but its position must, of course, be determined by the house connections. Another detail shows a simple pipe ventilator fixed to upper side of sewer, and passing through concrete to a small brick chamber having a ventilating grating, in all essential respects agreeing with the former suggestion. An additional section is given of an arrangement for ventilating sewers laid in steep gradients. The inlet sewer of 1ft. 6in. diameter, discharges into a vertical cast-iron pipe 9in. diameter, which passes down on the outside of manhole, inclosed in concrete, entering at the bottom of it with a kind of siphon bend into the outgoing sewer. Opposite the incoming-pipe is a storm overflow, with flap introduced into the manhole. By this simple arrangement, the effluvium often arising from manholes where sewers enter them at different levels, is to a large extent cut off from the manhole, as the vertical pipe forms an independent connection with the outgoing part of sewer, and the valve of storm overflow is only opened when a great volume of storm-water is passing through the sewers.

Those who have not obtained these sheets of detailed drawings, will do well to get them; they are all to a good working scale, ½in. to the foot, and with the supplementary sheet just issued may be regarded as a complete exposition of the approved system of sewering. A few years ago surveyors of local boards and corporations were placed at a great disadvantage in the preparation of the plans they were required to submit to the Local Government Board, when loans were asked for; there were no authorised data to consult, and engineers were obliged to adopt the opinions of various authors. Now all the information necessary in the preparation of the details of a scheme of sewerage and water supply can readily be obtained by referring to the "suggestions" published by the Local Government Board, and types of sections of manholes, lamp-holes, earthenware pipe-sewer junctions, flushing-chambers, outfalls, tidal flap arrangements, &c., are furnished at a trifling cost, saving an immense amount of labour and thought. No two plans present the same features in respect of drainage conditions; one town may have a flat surface, another a hilly and precipitous area, and a third a very low, level site, each requiring a different treatment of sewerage and interception. On level sites the construction of manholes and junctions do not present much difficulty; but in steep gradients it becomes necessary to divide and arrest the rush and scour of water upon the inverts of sewers to prevent wear. The details furnished in Mr. Rawlinson's sheet show how this may be effected by ramps and "tumbling bays," and the uprush of gas shut off by flaps on the ends of inflowing sewers. The back-watering of the branch sewers is also a common occurrence in steep gradients, but the manner shown of placing the inlet and outlet portions of the sewer on different levels in the manhole reduces the risk, as the main sewers must run quite full before there is any danger experienced. All the junction pieces entering the manhole, also the overflows, are shown of cast-iron, and when a number of junctions have to be made it is the cheapest material. Plans and sections of manholes for brick sewers on steep gradients are given in sheet No. 2; and not the least useful are the sections of flushing chambers for flat districts, and the main outlets for steep sea cliffs or flat shores. To the description is appended some useful memoranda on materials. It is recommended, for instance, that a good hydraulic mortar for sewer work be made of 2½ of clean, sharp sand, to 1 by measure of ground Portland cement, or lias lime. Half a measure of clean ashes or slag is a good substitution for that amount of sand. For inverts of manholes and sewers, concrete made of 5 of gravel and sand to 1 of fresh cement or lias lime by measure, may be used, though broken stone, bricks, &c., may be substituted for the gravel. Some useful observations on mixing mortar, concrete retaining walls, tanks and sewer-construction follow. The author proposes a good water-tight sewer, that will exclude subsoil water, by forming the invert in concrete floated in cement mortar, and building the brick inverts in two 4½in. rings, one within the other, and with a 1in. layer of cement between them. A number of practical suggestions will also be found appertaining to water supply.

DOMESTIC FIREPLACES.

THE recent paper by Dr. Carpenter on London Fogs goes to prove that the London fog, and, in fact, the fogs of all large, thickly-populated cities are due to unconsumed fuel, and the imperfect heating apparatus we now employ. One of the leading facts which press upon the manufacturer of our domestic stoves, is the construction of fireplaces which shall diminish the production of smoke by a more perfect combustion of the fuel. The introduction of slow-combustion stoves—such as those manufactured by Messrs. Barnard and Co., the Manchester Grate, and those manufactured of fireclay by Messrs. Doulton and others—is a step in the desired direction; and it may be necessary to direct the architect's attention to what must shortly become a recognised principle in construction. It is quite certain that a departure from the old type of fireplace, with its iron grate, must be made, if for no other than economical grounds, as it is well-known; and Dr. Carpenter reassures us that not more than one-sixth of the coal now consumed is usefully employed. The author suggests gas-fires as alternatives for open fireplaces, and no doubt for halls and consulting-rooms, they perfectly answer, but there are disadvantages in its use which the ordinary consumer of fuel would not readily put up with, such as the smell they sometimes give out, and the dryness of the air occasioned by them—faults which, as Dr. Carpenter showed, are more from imperfect construction than inherent in the use of gas-fires. The gas-fire could be fitted to any ordinary grate at the expense of laying on gas. In many houses the use of gas would effect a great saving, for it would save one servant, as there would be no dust, no fires to light, and no chimney-sweeps employed. The great advantage of a gas-fire in a sick-room is unquestionable: the patient is not disturbed by constant poking, so wearisome to the invalid, and the temperature of the room can be regulated at pleasure.

The recommendations of Dr. Carpenter are simple. As fuel smoke is considered the cause of the intensity of town fogs, he would abandon it, and also as wasteful in the extreme, since 5-6ths of the developed heat is lost, and much of the fuel passes away unconsumed; he, therefore, proposes to substitute gas at a cheap rate, so that it might be used for cooking as well as for heating; to prohibit the sale of coal in the metropolitan district, unless it had been previously deprived of its smoke-producing quality; and to put a tax upon fireplaces not constructed so as to consume their own smoke. Great opposition would be experienced in carrying out these proposals. To tax fireplaces would be to raise a storm of dissentient voices, and to prohibit the use of coal would be to run counter to the traditional custom of ages. But architects and manufacturers may do something at once to avert the mischief, and so postpone the radical change. They can construct their fireplaces upon the shallow plan of throwing out the heat into the room by cutting off the angles and lining the fire-box with fireclay, or they might endeavour to combine the principle of the slow-combustion fireclay stoves with the fireplace. We are sure a few well-conducted experiments would lead to a plan of constructing the fireplace that would be much simpler than the use or fitting of patent stoves, and we believe that the principle would admit of architectural treatment.

THE SOCIETY OF PAINTER ETCHERS.

IT is announced that the first exhibition of the Society of Painter Etchers, founded in July last, will be held at the Hanover Gallery, 47, New Bond-street, on Monday, April 4th. The exhibition will be of a novel character, being promoted with the twofold aim of representing the art of original engraving in all its forms, and of selecting the original Fellows of the new society. Works will be accepted from any source, but they must be original, and if for sale the *bonâ fide* property of the artist, and all forms of engraving on metal, whether with the burin, the etching-needle in mezzo-tint, or aqua-tint, "or by whatever other process the artist may choose as a mode of *original* expression" will be admissible to the exhibition. It is provided that at a date not later than the first Monday in May, 1881, the provisional council are to assemble in the gallery of the exhibition, and adding for the occasion three persons to their number, two of whom shall be members of the Royal Academy, they will prick off, each on a separate list, the names of those exhibitors who from the character of their exhibits appear specially to recommend themselves as Fellows of the Society; and afterwards, uniting in special committee for the purpose, "will proceed to elect as many as may then be determined upon of those exhibitors into the society, the persons so elected to constitute, with the provisional council, the roll of the society, and to become, *ipso facto*, its first Fellows." All works intended for exhibition must be addressed to "the Secretary," at the Hanover Gallery, 47, New Bond-street, and delivered free of charge, unpacked, and ready for hanging on Monday, March 14th, between the hours of 10 a.m. and 10 p.m., and if from a distance, to an accredited agent in London, who will unpack and deliver them at the gallery.

ROYAL ACADEMY ARCHITECTURAL SCHOOL.

ADMISSIONS, JAN. 1ST, 1880.

STUDENTS OF UPPER SCHOOL.—J. B. Phillips, J. C. Yates.

LOWER SCHOOL.—W. J. Allen, H. R. Best, Charles Burton, J. C. Carter, T. J. Dalziel, A. Heningway, E. W. Jennings, J. W. Johnson, E. Nevinson, J. F. Newton, F. Simpson, E. J. Slow, N. J. Stanger, P. Thicknesse, G. W. Winchester.

PROBATIONERS.—G. Blizard, E. B. L. Boyce, G. C. Horsley, H. H. Kemp, Arthur Kent, A. Leslie, H. W. K. Martin, H. G. Nixon, Herbert Read, Thomas Sims, J. A. Slater, R. E. Smith, C. H. Stock, W. Toogood, J. R. Withers.

The chancel of the parish-church of Pulborough, Sussex, was reopened on Christmas-day after the removal of the long deal benches and desks and other fittings, and their replacement by choir-stalls and two prayer-desks, richly carved in oak. The new seats have been made from the designs of Mr. James Fowler, of Louth.

The new chancel of St. James's Church, Croydon, was opened by the Archbishop of Canterbury on Friday week. It measures 36ft. long by 21ft. wide, and has been built from the designs of Mr. C. Henman, as the first portion of a reconstruction scheme, and was illustrated in the BUILDING NEWS of Oct. 29, 1880. Messrs. Laing and Co. were the contractors, and Mr. S. A. Clark, the clerk of works.

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ENTRANCE VESTIBULE TO SOMERSET HOUSE.—CAPS FROM CANTERBURY CATHEDRAL.—ARTISTS' HOMES: NO. 10 "YATTENDON," NEAR NEWBURY, THE RESIDENCE OF ALFRED WATERHOUSE, ESQ., A.R.A.—ROWDEN ABBEY.

OUR LITHOGRAPHIC ILLUSTRATIONS.

VESTIBULE TO SOMERSET HOUSE.—ROYAL ACADEMY PRIZE-MEDAL DRAWING.

ONE of our double-page plates to-day illustrates the beautiful drawing of the vestibule to Somerset House, for which Mr. Fredric Miller has just been awarded the Royal Academy medal for Perspective in outline. On Jan. 3 last year we published some measured drawings of the same gateway, for which the Royal Academy first silver medal prize was awarded in December, 1879, the author being Mr. R. W. Gibson. Further details from the same set of drawings were given in the BUILDING NEWS on March 21 last.

CANTERBURY CRYPT CAPITALS.*

IN the few minutes which it is customary to devote to a visit to the crypt of Canterbury Cathedral one is not so likely to be struck with any carving there may be as the general extent of the place itself. The great crypt, into which we first descend from what is known as the Chapel of the Martyrdom of Thomas-à-Becket, is described as the largest in the kingdom, and its long perspective of intersecting arches and groins is rendered, perhaps, more impressive by the semi-darkness which lends its mystical influence to the view. A gleam of light, however, may chance to fall across one of the pillars, and then your attention may be directed to the curious characters that are graven on the capital, and passing from one to the other, the archæologist or dilettante visitor is soon led to remark, in spite of "Time's defacing fingers," the tragic and comic interest with which most of them have been invested. Here is one displaying the interlacing character peculiar to Saxon ornament; there another indicating some degree of advance into the commencement of the Norman epoch. The exact date to be ascribed to the foundation of this imposing edifice has been the subject of some divergence of opinion among antiquarians, although the difference is one admitting of an explanation that has been adopted by Britton, as well as other eminent authorities on the subject. This may be put in a few words in referring to the events in the history of the crypt. After the general destruction of the edifice by fire, in A.D. 1070, Archbishop Lanfranc succeeded to this See, and commenced the entire reconstruction of the church from its foundations, and consequently some, if not all the existing pillars in the old, or, as it is called, the Great Crypt, may be safely attributed to this period, though not at present standing in their original positions,—the latter circumstance being explained by the fact that Priors Anselm and Ernulf, who succeeded Lanfranc about twenty years after, pulled down his choir and rebuilt it on a more extensive scale. As, therefore, the new piers of the proposed choir would no longer correspond with the limited arrangement of Lanfranc's pillars in the crypt below, we might naturally conclude that, while they retained the pillars themselves, they altered their positions to suit the new points of the proposed superstructure. This hypothesis, while reconciling the date of the pillars with their present position, is partly strengthened by the appearance of the groining being later in character than the shafts supporting it. It is quite probable that the date of the carving with which the capitals are embellished extended over a period of some considerable duration, generally included between the dates of 1090 and 1135. In these strange conceptions the execution is necessarily rude; but we must remember how important they might be as expressions of the faith of those by whom they were designed and the primitive condition of the times. By means of these outward forms, rude as they may appear, the chief incidents of the Christian religion became intelligible to all, and assisted in inspiring them with feelings of devotion and love. In many cases these symbolical representations may be clearly interpreted, although the specimens on which the selection has fallen for illustration, are remarkable rather for curiosity or grotesqueness of design than for any very clear symbolical meaning. Two of these appear to represent warriors, one going to, the other presumably returning from, the wars, indicated in the latter by his exultant attitude with a recumbent figure under his feet. The centre one we should be inclined to suppose might have been intended as a representation of the face of Jesus, and possibly indicating his last moments on the cross. The lower row, though rich in conception, are a little doubtful in meaning. The dragon, as is well known, is almost universally used as an emblem of Sin or Satan, and the meaning of the action in spearing a wolf with his fork possibly is to illustrate his final victory over the wicked. The musical vein of the next is apparent, and may possibly be illustrative of one of the numerous exhortations in the Psalms to praise God with "stringed instruments and organs," or "Let everything that hath breath praise the Lord," thus figuratively including the animal creation. If, however, any symbolical meaning is to be attached to the last in the set, it is beyond the writer's interpretation. Many of the shafts are ornamented with Norman enrichments. It is not so easy to discover what the bases are like, they being buried in the accumulated rubbish and soil of centuries' deposit. Once more reverting to the general condition of the crypt, it cannot but be deplored that while so large a sum has just been expended in the appointments of the beautiful choir above, that something might not have been devoted to the proper maintenance of this ancient monument of the past. But although Mr. Neale has been engaged in the restoration of the portion appropriated by Queen Elizabeth to the service of French Protestants, the main body of the crypt is left in the most neglected condition. No longer retaining its legitimate character as sacred to the relics of departed saints, it is everywhere desecrated by such utilitarian purposes as coals, lumber, and pipes. The floor, once beautifully paved, is now but of common earth, damp and uneven; the exquisite chapel at the eastern end, dedicated with such former splendour to the Virgin Mary, is unkept and uncared for, and dedicated now apparently to nothing but dirt, darkness, and decay. Such, I regret to say, is the present condition of what Britton says claims distinction as the oldest, finest, and most interesting crypt in England; and whether viewed in regard to "extent, construction, or ornamental detail, must alike excite the admiration of the architect and the antiquary."

* The complete series of 24 sheets is published in a limited form by J. Donkin, 17, Argyle-road, Kensington, W.

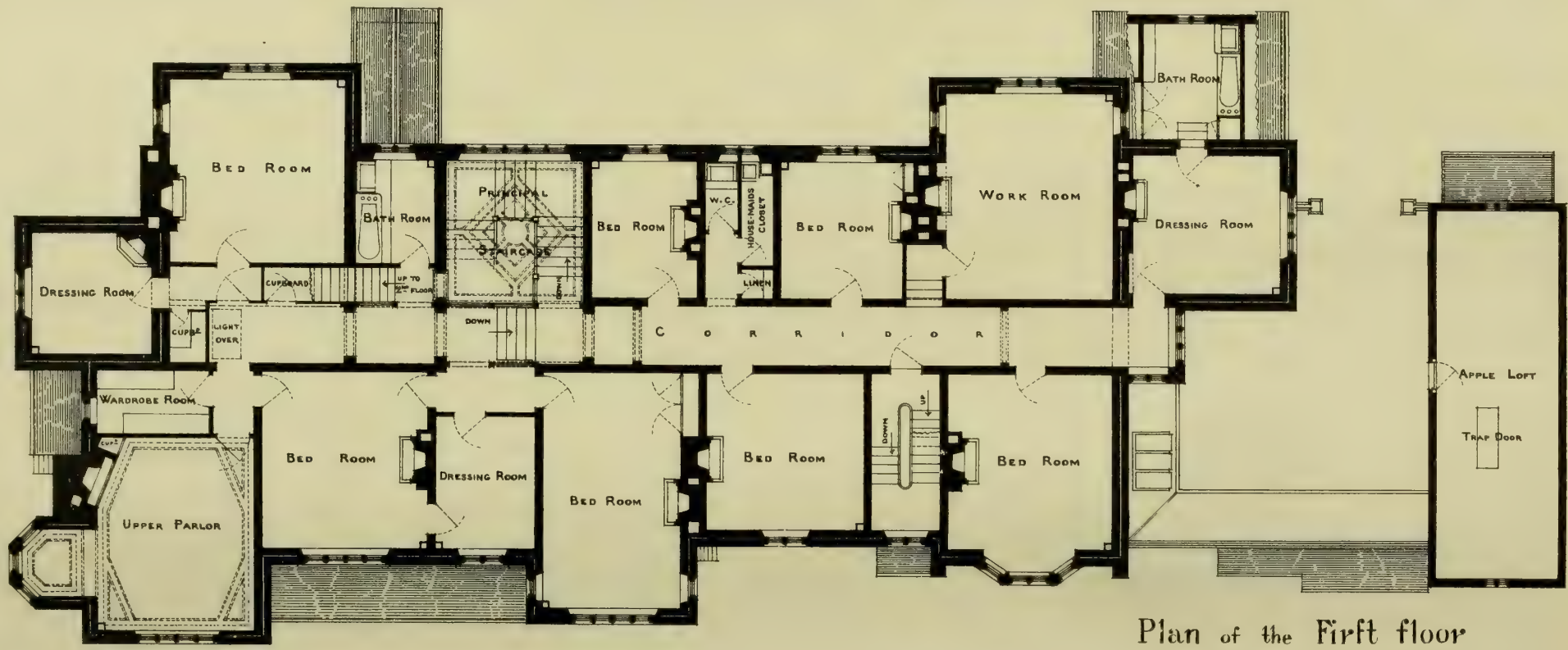
ARTISTS' HOMES.

WE give this week illustrations of a house, at present in course of construction by Mr. A. Waterhouse, A.R.A., for his own residence. It is situated at Yattendon, a small village about ten miles to the west of Reading, in a district interesting alike from the beauty of its scenery and its historical associations. At the east end of the village there rises a hill of meadow-land, skirted by picturesque woods, on the summit of which, some 450ft. above the sea level, stands a clump of tall and weather-beaten silver firs, which serve as a landmark for miles around. The house is placed under the shadow of these firs, and is approached through a wood, by a drive which leads to the open (oak) porch on its north side. The arrangements of the interior will be sufficiently explained by the plans of the chief floors, which we give herewith. The principal staircase, with a double arcaded screen at its head, is of oak; so are the fittings of the hall. The woodwork of the library, which is surrounded with shelves for books and drawings to the height of about 8ft., is of American walnut; that of the dining-room, of a combination of walnut, mahogany, and ebony. The woodwork of the parlour, and that of the "Upper Parlour" or boudoir, is painted; the rest of the house is of varnished pitch-pine. The fireplaces, some of which are commodious and furnished with seats, are of the simplest form, lined with glazed fireclay and tiles; the fires, either of coal or wood, being made on the hearth, without the use of any sort of grate. The external walls are hollow, bonded with Jennings's patent glazed terra-cotta ties, and faced with red bricks of an excellent colour, made on the spot, with a considerable admixture of buff terra-cotta. The roof is covered with red Ruabon tiles. The upper part of the tower on the west side of the house is occupied by a large cistern, intended for use in case of fire. From the lead flat above the cistern, an extent of view is obtained probably unequalled in this part of Berkshire. On the north stretch the Compton Downs. On the east one sees the valley of the Kennett, towards Reading, the town itself hidden by the hills dividing this river from the Thames, while beyond are two hills, S.W. of Windsor. It is even reported among the villagers, that the Royal Castle itself (distant 25 miles) could be seen before the growth of the woods obstructed the view. But it is on the south that the prospect is most varied and extensive. About a mile off rise the wooded slopes of Frilsham, with undulating corn-fields in the foreground. On the left, the land slopes to the little river Pang, where it flows through Stanford Dingley on its way to the Thames. On the right rises the dark ridge of Cold Ash Common and Grimsbury Castle, while beyond are the blue hills of Hampshire, above Kingsclere and Highclere, terminating abruptly at Walbury Beacon, nearly 1,000ft. high. In making the excavations for the house, the remains of a beacon were brought to light. The interest of the site was further increased by the discovery, about the same time, of a remarkable hoard of bronze implements, which were exhibited and described to a meeting of the Society of Antiquaries by Mr. J. Evans, V.P., 5th Dec., 1878.

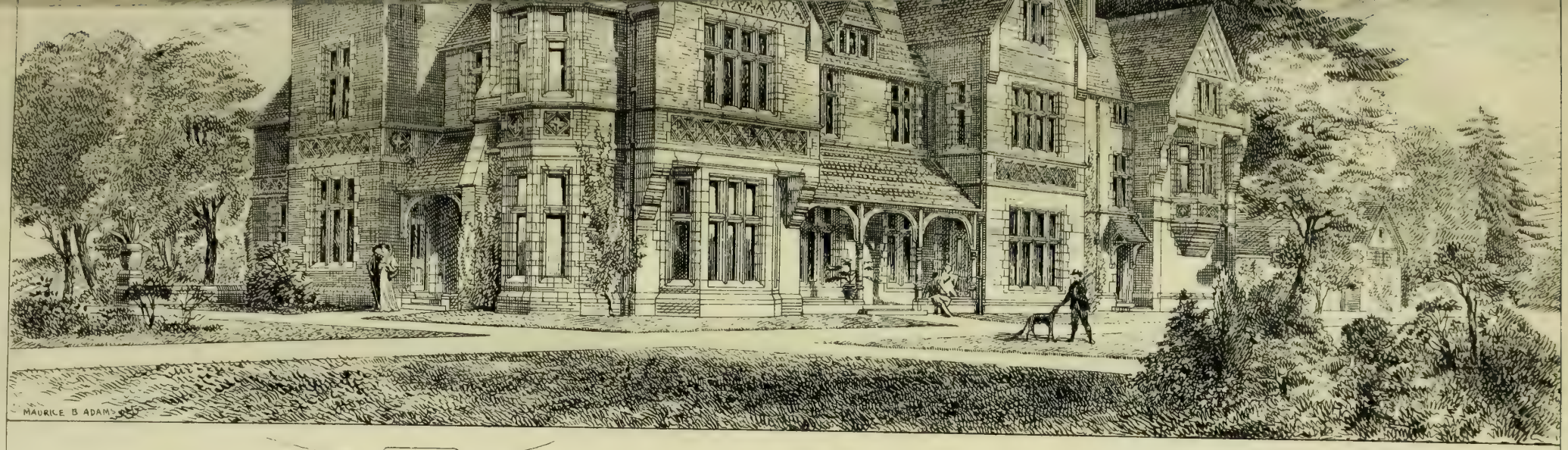
ROWDEN ABBEY.

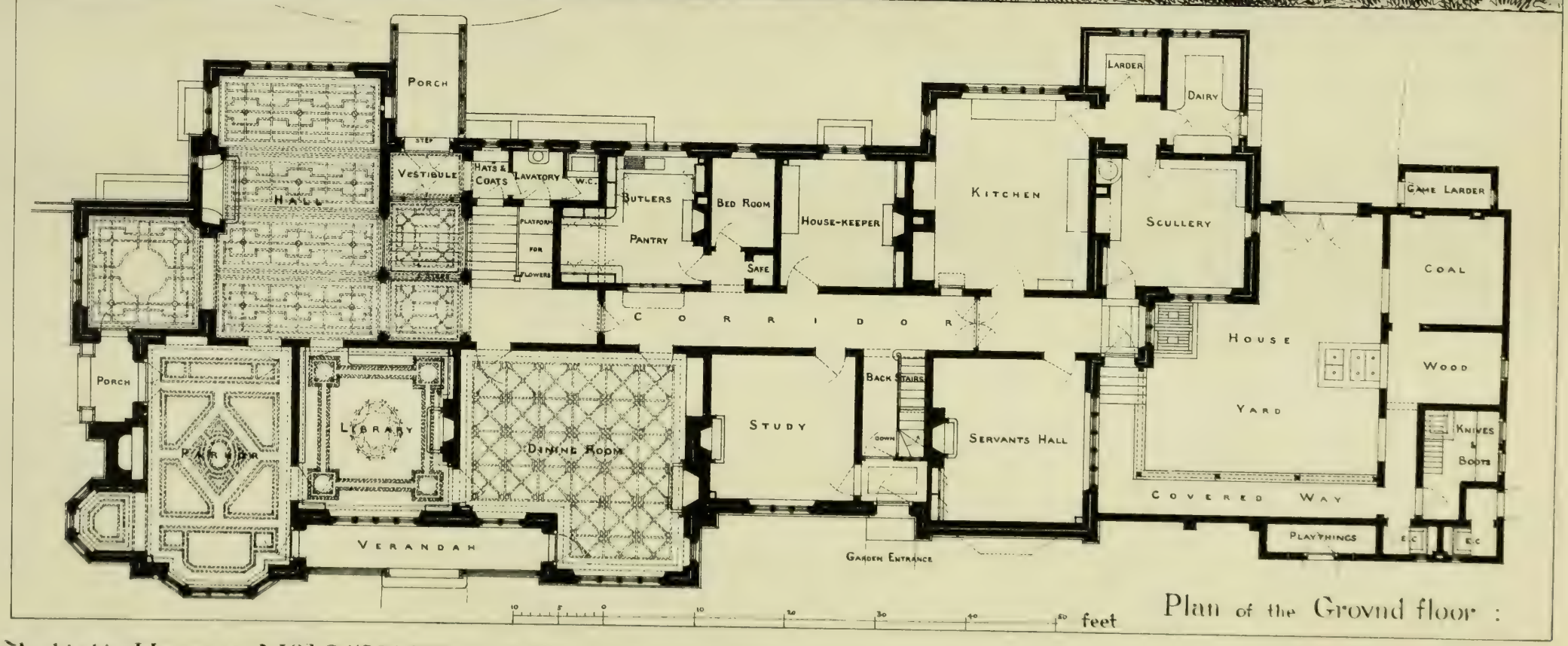
THIS new house, of which we give two views, with ground-plan, is built on the hill-side, a short distance above the site of the abbey from which it takes its name. Of the latter there remain only some fragmentary portions of the walls, and a small bridge which once spanned the brook, and formed the approach to the abbey. The half-timbered style has been chosen for the new building, as being suitable for the locality, the site being a short distance from the boundary between Worcestershire and Herefordshire, where many old timber-built farmhouses and cottages still remain. The construction is of solid oak framing, on a foundation of local stone, with brick chimneys and brown tiled roofs. The hall and dining-room are panelled in oak framing, with ribbed ceilings, the whole of the joiner's work in the best portion of the house being executed in oak. The work has been well carried out by Mr. Thos. Espley, of Eccleshall, Staffs., Mr. Jas. Hodgson being the clerk of works. The architect is Mr. John Douglas, Chester.

A stained-glass window has just been placed at the west end of Holy Trinity Church, Hastings. In the upper tracery is a representation of the "The Majesty," and in the six lights beneath are figures illustrating the dedications of the following local churches:—St. Leonard, St. Mary Magdalen, St. John the Evangelist, St. Mary the Virgin, St. Andrew, and St. Clement. Beneath each figure is a medallion group representing an incident in the life of the saint. The window is the work of Messrs. Clayton and Bell, of Regent-street, London.



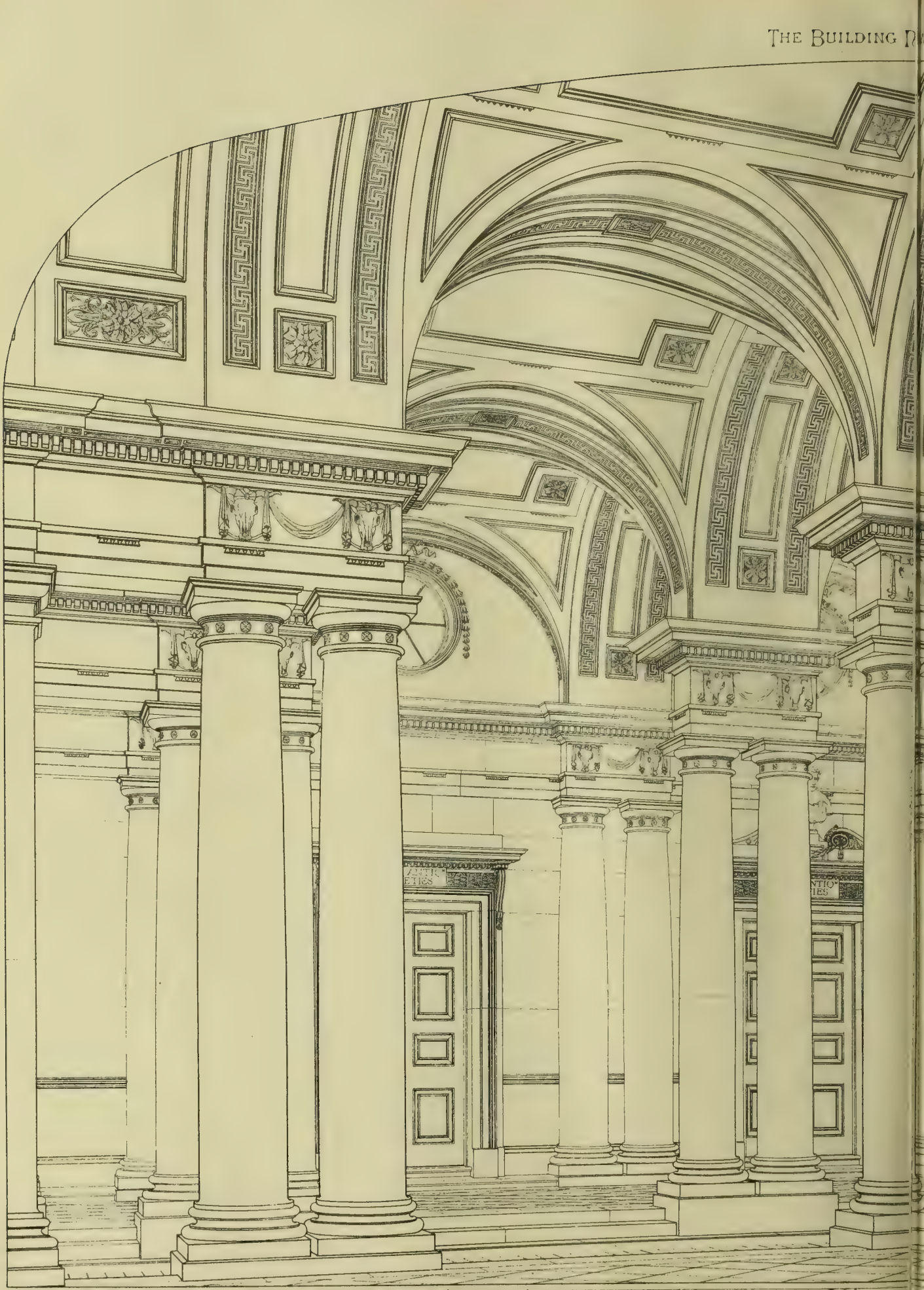
Plan of the Firft floor





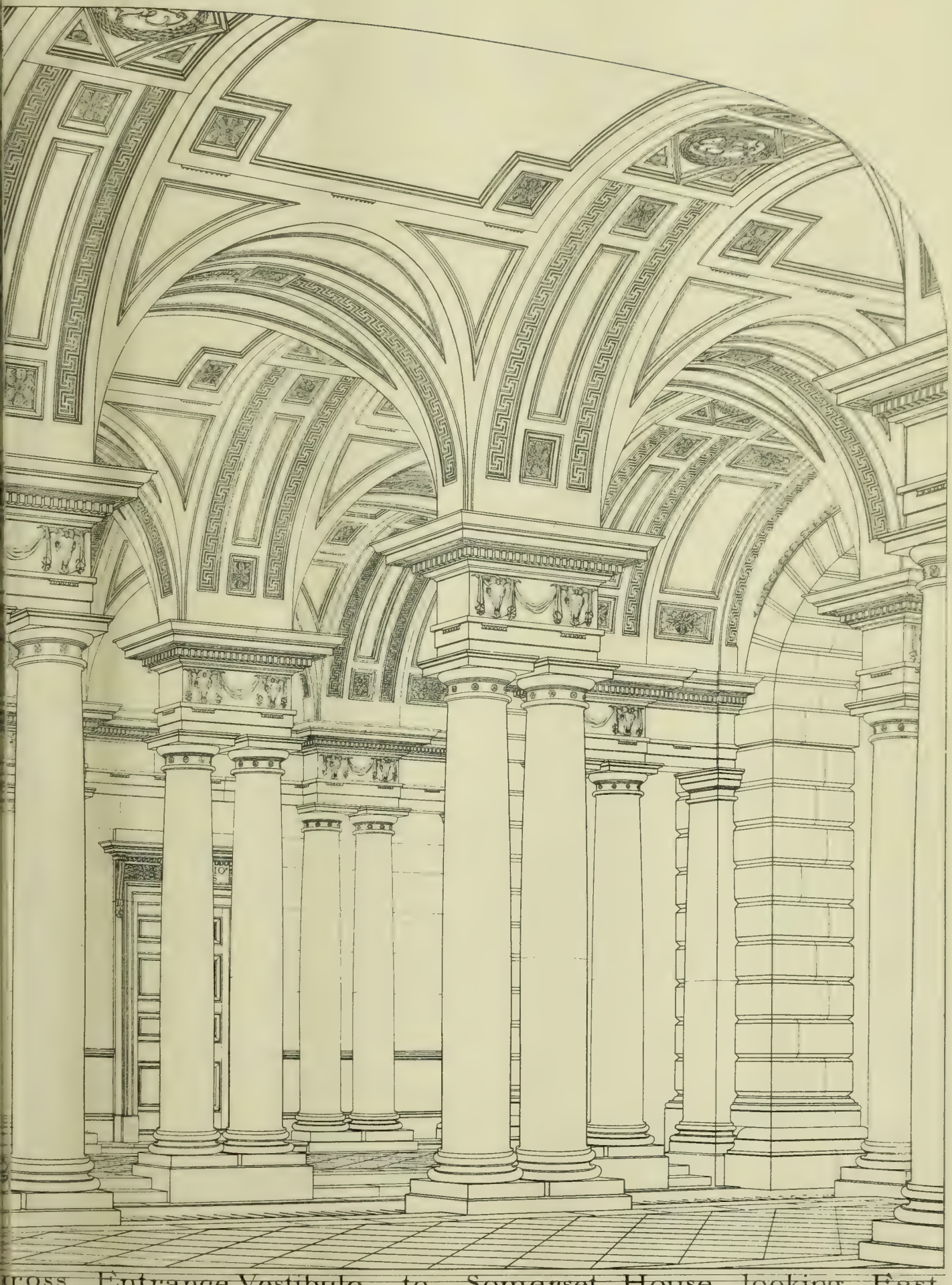
Plan of the Ground floor :

Artist's Homes No 10. "YATTENDON" near Newbury · RESIDENCE OF Mr ALFRED WATERHOUSE A.R.A. ARCHITECT



PERSPECTIVE IN OUTLINE. Subject :- View t

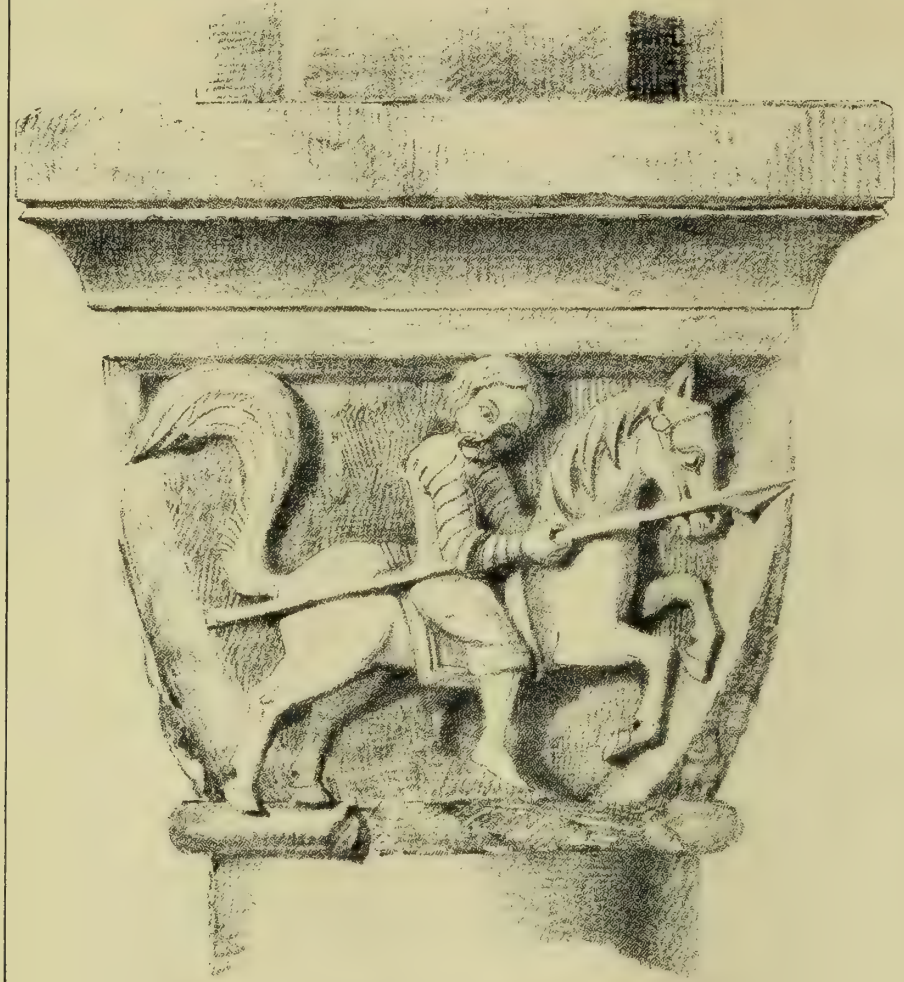
ROYAL ACADEMY PRIZE MEDAL W

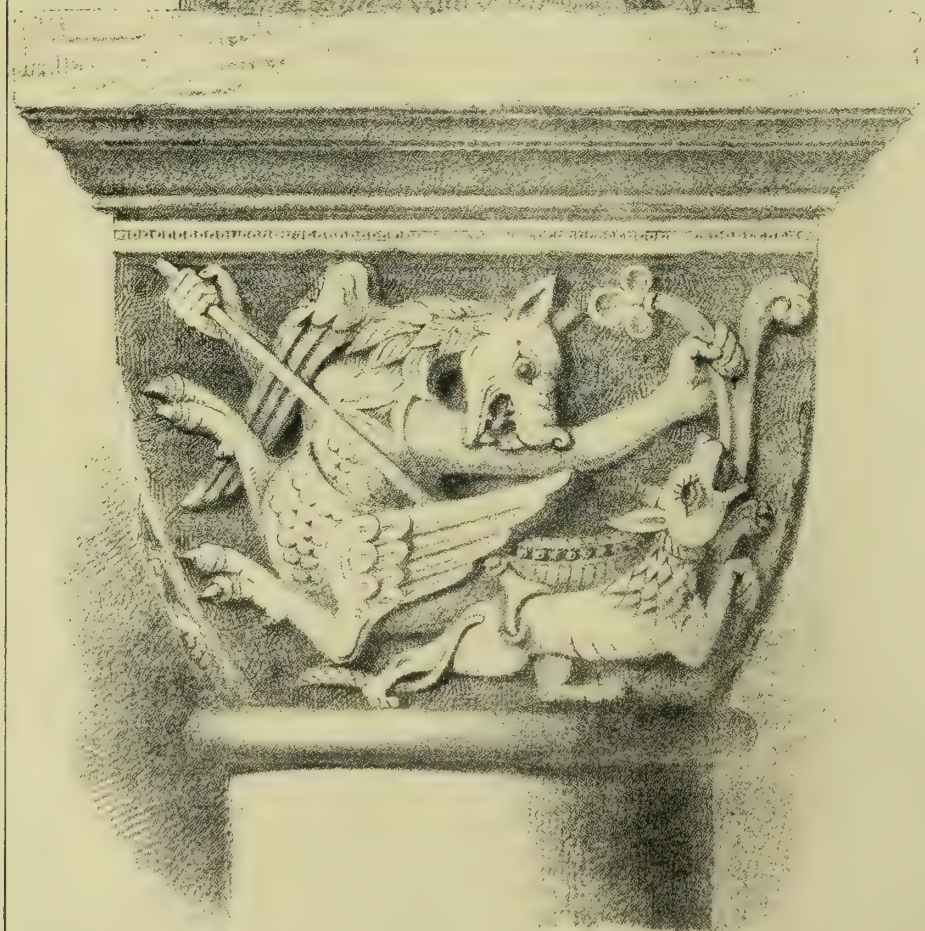


ross Entrance Vestibule to Somerset House looking East.

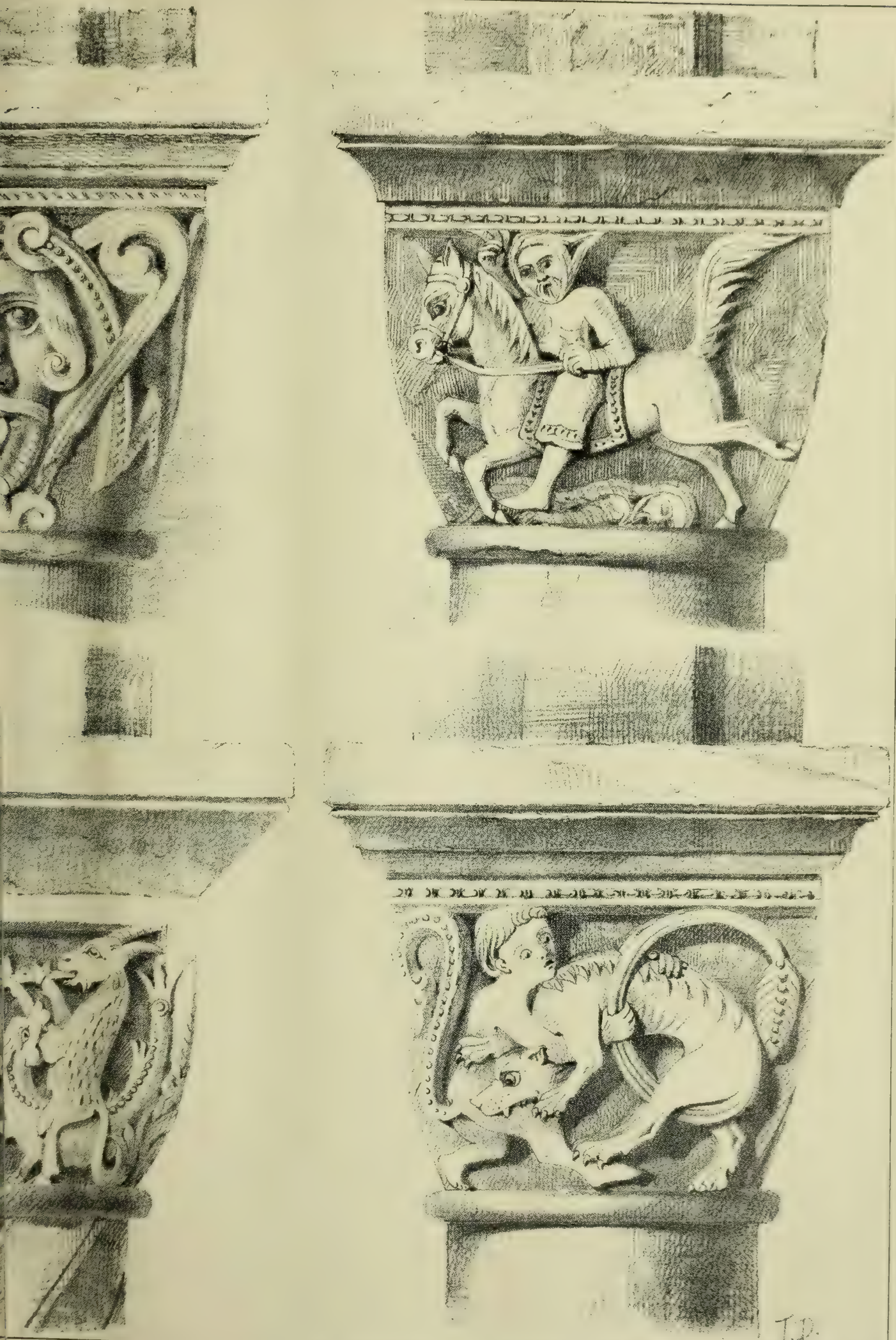
Fores Lithographed & Printed by Fores Alexander St Queen Square W.

ARDED 1880 TO FREDRIC MILLER





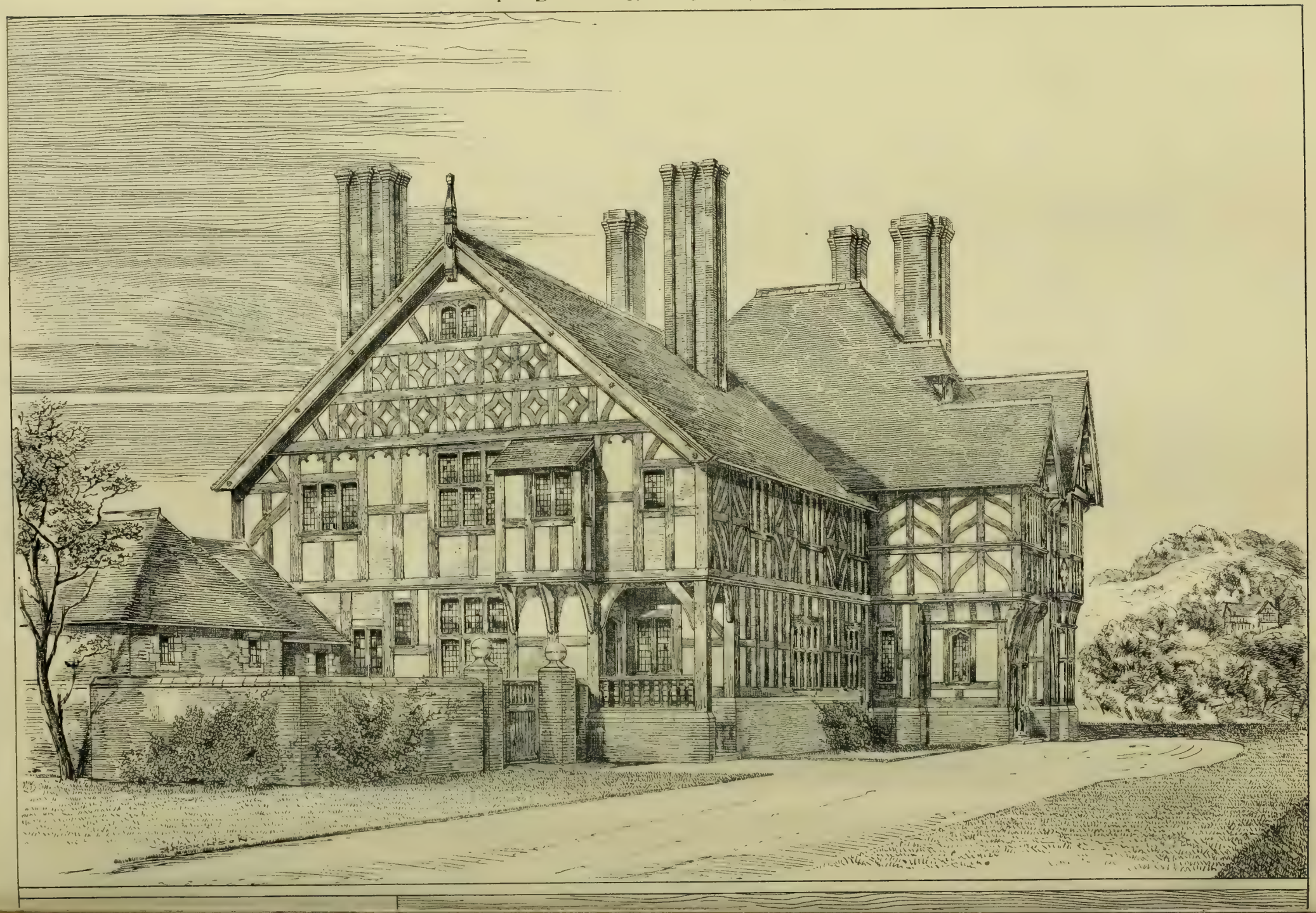
CAPS FROM CANTERBURY

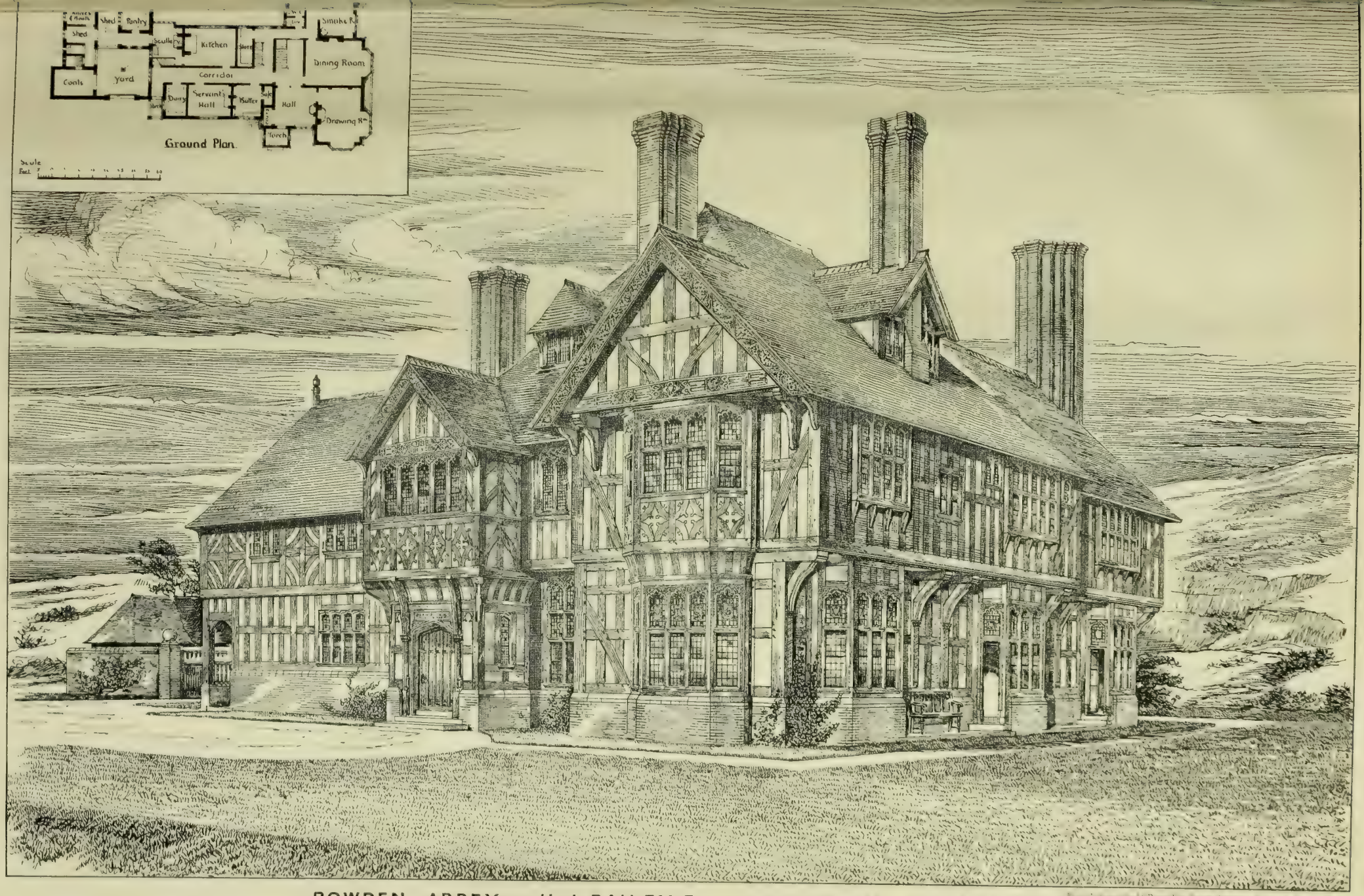


J.D.

DRAL, DRAWN BY J. DONKIN.

Photo-Lithographed & Printed by James Akerman 6 Queen Square W.C.





ROWDEN ABBEY - H.J. BAILEY Esq John Douglas Architect

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

REPRESENTATIVES of the Press were, for some reason, excluded from the ordinary meeting of the Institute, held on Monday evening, but from the *Proceedings*, issued yesterday, we are enabled to epitomise the business of most general interest.

The President, Mr. Whichcord, occupied the chair, and 14 gentlemen were elected as fellows, 30 as associates, three as hon.-associates, and six as hon. and corresponding members.—The death was announced of M. Hector Martin Lefuel, of Paris, vice-president and inspector-general of the Conseil des Bâtiments Civils. On the death of Visconti he was appointed architect to the palaces of the Louvre and Tuileries, and held the office until he died. He was a past-president of the Société Centrale des Architectes, Paris, and he acted as Chairman of the Jury in the Fine Arts Section of the Paris International Exhibition, and as President of the International Congress of Architects held in that city in the same year.—Mr. Joseph Clarke formally presented to the Institute a portrait of Mr. Charles Barry, ex-president, painted by Mr. Lowes Dickinson, and the subject of the portrait declared it to be a high work of art, and expressed his thanks to the artist for having bestowed on it an amount of labour for which he certainly could not receive anything like a due recompense.

ST. MARK'S, VENICE.

The following letter was read :—

14, Cavendish-place, Cavendish-square, W., Dec. 31, 1880.

DEAR MR. WHITE,—I inclose some of the circulars of our committee (St. Mark's, Venice, Committee). I think many of the Fellows and others of the R.I.B.A. will like to hear of the existence of the committee, but I do not know that there is anything I need add to the statement of the objects contained in the circular. I am glad to say that the Academy of St. Luke has expressed lately a decided view as to the recent restorations, and I am sanguine enough to believe that, for the future, works of absolutely necessary repair alone will be executed at St. Mark's.—Believe me, yours very truly,

GEORGE EDMUND STREET.

The circulars stated that the committee, individually, and as a body, being actuated by the most cordial and friendly feelings towards the Italian nation, would take care to act as delicately as possible by friendly representations, and with every determination not to wound any national susceptibilities, or to take exception to what are plainly necessary repairs. The committee, with power to add to its numbers, consists of representatives from Venice and other parts of Italy; from Paris, Vienna, Stuttgart, Zurich; from America, Holland, and the United Kingdom. Mr. Street is the vice-chairman, and Mr. Henry Wallis the hon. secretary. The offices of the committee are at 9, Buckingham-street, Strand, W.C.

Mr. EWAN CHRISTIAN said :—I paid a visit last October to Venice for the purpose of seeing St. Mark's before it was destroyed, and I hope that a great number of the members will join this committee, for I believe that its action or the agitation it has commenced was the means of stopping a work which would have utterly destroyed the west front of St. Mark's if it had been persisted in. Mr. Street some months ago wrote to the *Times*, and also spoke at a meeting of the Society of Arts—not describing what was proposed to be done, but what was actually being done. If the proposed new construction had been proceeded with, the whole of the west front of St. Mark's must have been rebuilt—every part must have been re-set, and we all know what the re-setting of St. Mark's would mean. A more thorough destruction of an ancient monument could not be imagined. All the mosaics must have gone, and almost the whole of the interesting irregularities, for there is an immense number of them in the present front, and they would all have been destroyed. That has been stopped, and from the fact of the hoarding being cleared away, it is tolerably evident that they do not intend to go upon these lines in future. But on the other side they are carrying out the removal of the casing and the re-setting of it, and they are doing it in a way which would horrify gentlemen sitting in this room—without the slightest care or protection of the capitals of the pillars. When I was there only some scaffold boards, upon which the men were working, were laid upon the abutments and upon the scaffold poles; they were hammering away at the brickwork, which is the background of the marble facing, and bricks were tumbling about as fast as they could. It is really sad to think of the destruction that may be caused even if this kind of "repair" is carried out, because in such a building very little carelessness on the part of the workmen may be irreparable.

Mr. C. BARRY added, as his belief, that the sympathy of a large number of the members of the Institute would be with the movement to preserve intact the grand old basilica of St. Mark. The paragraph of the report which said that the committee would take the greatest possible pains not to offend the national susceptibilities of the Italian nation, would, he thought, remove all hesitation which had weighed on many in joining the movement. If we were so imprudent, to say the least, as to place themselves in a position of dictating to the artists of a foreign nation, they would not unnaturally resent it, as we should do under similar circumstances. This feeling had probably prevented that adhesion and sympathy being outwardly expressed which all inwardly felt.

FINE ARTS EXHIBITION AT MADRID.

Copies of translations of the proposed regulations for the general exhibition of fine arts, to be held at Madrid in April next, were placed on the table, and a letter relating to them was read by the secretary from the Marquis de Casa Laiglesia, of the Spanish Legation in London.

EXAMINATION REGULATIONS.

The President introduced the subject of the examination under By-law XIV. by an address, in which he described the proceedings in committee which had resulted in the formulation of proposed regulations, and a programme of the architectural examinations. These proposals were printed and issued to members just before Christmas-day. With the assent of the Rev. Richard Aspitel, a modification would be proposed to be made in the Aspitel prize, which it was recommended should henceforth be given once a year instead of biennially, and to that successful candidate who, during the year's examinations, should distinguish himself most creditably in any one of them. He then formably moved that the regulations and programme of the examination under By-law XIV., as approved by the council, and printed on pp. 95 to 98, inclusive of the *Journal of Proceedings*, 1880-81, be received and adopted.

The motion having been seconded by Mr. Arthur Cates, a discussion ensued, in which Messrs. Lacy W. Ridge, Robert Walker, Ewan Christian, H. Dawson, E. C. Robins, C. Fowler, J. Douglass Mathews, E. G. Bruton, R. Phené Spiers, Robert Kerr, T. H. Watson, J. S. Quilter, H. H. Stannus, H. L. Florence, C. Barry, and the President joined; and it was resolved "That the regulations and programme of the examination under By-law XIV., printed on pp. 95 to 98 (inclusive) of the *Journal of Proceedings*, 1880-81, be adopted, subject to the insertion after the word 'plan,' on page 98 (ninth line), of the words 'section and elevation.'"

LUMINOUS PAINT.

MESSRS. IHLEE AND HORNE, 31, Aldermanbury, E.C., have just coated a ceiling at their offices with Balmain's luminous paint, or, in this case, water-wash. The effect is that of a subdued light, every object in the room being clearly visible, so that in a room so treated one could enter without a light, and find any desired article. The luminous paint is excited by the ordinary daylight, and its effects continue for about 13 hours, so that it is well adapted for painting bedroom ceilings, passages that are dark at night, and other places where lamps are objectionable or considered unnecessary. For staircases and passages a mere band of the paint will serve as a guide, and costs but a trifle. For out-door purposes the oil-paint is used, but for ceilings and walls the luminous paint, mixed with water and special size, can be used the same as ordinary whitewash, and presents a similar appearance in the daylight. We have previously given a short account of the many applications of which this paint is capable (see p. 155, Vol. XXXVIII.), but the comparatively recent discovery that it can be applied as ordinary whitewash considerably expands the field of its usefulness. Sheets of glass coated with the paint form Aladdin's lamps, which are in use in some of the vessels of the navy, at the Waltham Powder Factory, at Young's Paraffin Works, and in the spirit-vaults of several docks; but now that, by increased production and the use of water as the medium its cost is reduced by one half, it will probably be extensively used for painting walls and ceilings. The ordinary form of oil-paint has already been applied in many ways, to statues and busts, to toys, to clock-faces, to name-plates, and numbers on house-doors, and to notice-boards, such as "mind the step," "to let," &c. The paint emits light without combustion, and therefore does not vitiate the atmosphere. The room at Messrs. Ihlee and Horne's can be seen by invite card on any day from 10 a.m. to 4 p.m., and a visit will convince any one of the value of the paint for the purposes named. Several experimental carriages are now running on different railways, the paint being used instead of lamps, which are necessary all day on account of the line passing through occasional tunnels.

ROMAN REMAINS IN THE TOWER OF LONDON.

MR. E. LOFTUS BROCK, F.S.A., gives a brief report of a discovery recently made within the walls of the Tower, of no small interest in relation to the course of the old rampart of the City of London. Many readers will recollect the existence of a range of modern-looking buildings close to and obscuring the east side of the old White Tower. These have recently been demolished, to the great improvement of the keep, which is now opened to view, and which reveals a large portion of the old Norman masonry of its walls in excellent condition. The modern buildings have been cleared away down to their foundations. During the visit of some of the country members of the British Archæological Association in November last attention was drawn by the courteous authorities to a wall which had been noticed among the foundations, and in part demolished by them, but which had formed no part of the removed buildings. We pronounced this wall to be Roman work, and suggested that it should be opened out. The Major of the Tower, Major-General Milman, C.B., at once had this done. Since then Her Majesty's Office of Works have cleared it down to its foundations, and it is now open for public inspection.

The wall is so exactly of the same construction as that recently found in America-square as to point to the same origin. In fact, this and that are but two portions of the same wall. There is the same foundation of clay and flints, the facing of somewhat small stones of square rag, the same dark brown ironstone chamfered plinth on the outer or country side, and the same double course of bright red tiles going through the entire thickness of the wall; all pointing to similarity of design and date of construction. Unfortunately, the extreme height here is only 6ft. 4in., and the length only about 11ft. 6in. The thickness is 6ft. 10in. above the plinth. It commences at the extremity of the well-known Horse Armoury Gallery, and ends abruptly where it was cut through many years ago to form an underground approach to the vaults of the White Tower, when they were used for the extraordinary purpose of gunpowder storage. The wall, doubtless, may be found still further northwards, and it is greatly to be desired that excavations may be made to open for inspection a greater length of this the only fragment now visible from above ground of the old wall of the Roman city.

The course of the fragment is remarkable. Were a line drawn from the well-known existing remains of the City wall in Cooper's-row it would all but touch its southern end; this line would be inclined to the White Tower, but parallel to some of the paths and buildings to the east of it. The fragment, however, has no reference to this, its theoretical course from its point of junction, since it is more parallel to the White Tower itself. The reason of this change of direction will probably be determined when the wall is opened to a greater extent, and which will clear up the interesting inquiry as to whether or not the wall had any connection with any buildings on the site of the Tower. Its course southward would be in the direction of the spot where the foundations of a massive tower were met with about 1720, and close to that where an ingot of silver and three late

Roman gold coins were found about 100 years ago.

The southern extremity of the fragment is lost under the modern walling of the Armoury, and in a mass of masonry of semicircular form. This is the base of the mediæval Wardrobe Tower, and which projects from the eastern, or country face, of the wall. The lowest portion of this is of earlier date, and, although of different construction from the Roman wall, yet the rough masonry is here and there cemented with red mortar formed of powdered Roman brick—a peculiarity that does not occur in the wall itself. This probably may prove to be a fragment of a third instance of a bastion of Roman work built against the rather earlier wall—the two others being that found in Camomile-street in 1876, and that found in Duke-street, Aldgate, a few weeks ago.

The thanks of the British Archæological Association for so far opening out these remains have been rendered not only to Major-General Milman and to Her Majesty's Office of Works, but to Mr. John Taylor, who, in his capacity of surveyor to the department, has taken much interest in this curious discovery. The portion of the wall opened to view will be found close to the east face of the White Tower.

ARCHÆOLOGICAL.

ANOTHER CLIFF-TOWN DISCOVERED.—The occurrence of ancient cliff-towns, built upon or rather in almost inaccessible places along the precipitous sides of river canons in Colorado and New Mexico, was made known several years ago. Another very important discovery of this nature was made a short time since by Mr. James Stephenson, of the U. S. Geological Survey, in New Mexico. The city lies in a canon thirty miles long, never before visited by white men, and is about forty miles from Santa Fé and ten miles from the Rio Grande. It consists of a succession of excavations in the solid rock throughout the length of the canon, making, perhaps, the largest cliff town yet discovered. The houses are dug out of the rock side to a depth of from fifteen to twenty feet. Apparently they were excavated with stone implements. They are almost inaccessible from the plains. Mr. Stephenson, however, managed to clamber up the rocky precipice, and entered and examined a number of articles that he thought remains of their first possessors. A scientist who has travelled in that region and visited other caves and excavations of a similar kind says he is disposed to believe that they have been tenanted within modern times by Indians at war with other tribes, seeking safety and advantage over their enemies. He thinks the remains found there are the remains of the things these belligerents have used, eaten, or worn, and not the relics of the first owners of the rock houses.

BROMHAM.—During the recent Congress of the British Archæological Association at Devizes in August last an ancient Roman villa in this neighbourhood was visited and inspected, and so interesting did it prove a general wish was expressed that a thorough and complete examination might be instituted, as it was felt important and interesting discoveries might be made. Mr. Butler, upon whose farm the remains are situate, having kindly given full liberty for this to be done, a local committee has been at work at Bromham during the past week, and the result of their labours has been such as to justify the predictions made. The labours entered upon have so far, of course, only been of a preliminary character, but several articles of pottery, urns, and coin have been discovered, and the foundations of several chambers have been unearthed; also a length of wall, probably not less than 200yds. in extent, and varying from two to four feet in thickness. The outline of the villa may now be very fairly seen. The examination of the courts and apartments will be deferred until next summer, when doubtless, matters of importance to archæologists will be revealed.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—An ordinary meeting was held at the rooms of the Association, Queen's College, on Tuesday evening last, at which a paper on "Architectural Physiognomy" was read by Mr. Fred. W. Cross.

COMPETITIONS.

BRIGHTON.—The town council of Brighton decided on Wednesday to institute a competition for designs for a clock-tower and urinal to be erected in North-street. Premiums of £20, £15, and £10 are offered. The designs are not to exceed £1,500 in cost of erection, exclusive of the clock, and are to be sent in before 4 p.m. on March 3rd next.

CLITHEROE DAY AND SUNDAY-SCHOOLS COMPETITION.—The committee, on the 22nd ult., placed the five designs, reviewed last week, in the following order of merit, viz.—"Limestone," by Mr. W. S. Varley, Blackburn; "As You Like It," by Mr. R. Knill Freeman, of Bolton and Derby; "What do You Think," by Mr. Edward Clarke, London; "Octagon," by Mr. J. Wardle Bulcock, of Blackburn and Clitheroe; "Simplex," by Messrs. Bromilow and Cheers, Liverpool, the first and second premiums being awarded to the first two named.

THE ROWLAND HILL MEMORIAL.—A meeting of the Mansion-house Committee of the Rowland Hill Memorial Fund was held on Thursday, when the total of the fund was reported to amount to £17,286. In regard to the statue of Sir Rowland Hill, at the site in Royal Exchange buildings, the sub-committee reported that they had received 14 models, nine being of erect and five of sitting figures, and that, having visited the site and taken occasion to see most of the public statues in the metropolis, they were strongly and unanimously of opinion that the statue should be an erect and not a sitting figure. Sir Frederick Leighton had, on the invitation of the committee, placed his services at their disposal in the selection of the best work of art, and had suggested that the committee should also ask two senior sculptor members of the Royal Academy to act with him, and that their award should be final. The committee proposed, therefore, to invite Mr. Calder Marshall, R.A., and Mr. Woolner, R.A., to join Sir Frederick Leighton as umpires, and they proposed, on receiving the final award, to make the necessary arrangements with the successful artist for the erection of the statue, in accordance with the conditions laid down. The report was adopted unanimously.

TORONTO.—The competition for public buildings at Toronto has resulted very badly, according to the *American Architect*. Although arranged with remarkable fairness and care, the terms of the competition required such a vast amount of useless work as to make it impracticable for architects with other important engagements to compete, and the absence of any guarantee that the award should be made by professional judges operated still further to deter the best class of designers. Sixteen sets only of drawings were received at the appointed time, nearly all, it would seem, from local architects, and, in accordance with the agreement, three of these were allotted premiums, the first, of two thousand dollars, being given to a plan marked "Datur Digniori," the second, of one thousand dollars, to one entitled "Waterloo," and a third, of five hundred, to "Nox." So far from the object of the competition being attained, however, by the awards, the experts declined to recommend any of the prize designs for execution, considering them all unworthy of the site, and although the Government acquires the title to the premiated plans, it is understood that they will not be used, and the Province of Ontario is, after paying away its thirty-five hundred dollars, as far from having a convenient and creditable public building as ever. One design only received mention as being "architecturally good," but its cost was excessive. A competition for a great public building which results in the production of but one good design, and that too costly for use, must be regarded as a practical failure; which in this case is the more to be regretted on account of the evident desire of the officials who directed it to obtain the best result result by the most honourable means.

A meeting of the Broadstairs Pier and Harbour Commissioners was held on Monday evening, when it was resolved that a jetty, 455ft. long, be erected in a northerly direction from the old pier.

The Tottenham Local Board, on the 21st Dec. last, accepted the tender of £19,708, of Mr. John Bell, contractor and builder, Wood Green, N., for Limmer asphalte paving, granite kerb, and crossings, for contracts No. 5, 4, 3, and 2.

Building Intelligence.

ASCOT.—The old rectory at Ascot has been considerably enlarged by the addition of an oratory and schoolroom for the Rev. W. Kirk Pierce, at a cost of £1,020, by Mr. W. Watson, builder, of Ascot, under the superintendence of Mr. Byrne, architect, of Windsor, and 12, Buckingham-street, Strand. The four stained-glass windows in the oratory were executed at the Royal Stained-glass Works at Old Windsor, from the designs of Mr. Westropp, of that establishment.

HANLEY.—The School of Art, which has been closed eight months for additions and alterations, will be reopened on Monday, the 10th inst. The school, previous to the additions, consisted of one room 60ft. by 36ft., which had to serve both for elementary and advanced students; and a library, 25ft. by 15ft., on the first floor, with modelling-room, over the library, formed in the roof. The whole were approached by a narrow and inconvenient entrance and staircase. The accommodation provided for only 75 students, but generally the attendance numbered upwards of 120. The alterations consist of an additional story over the old school, containing antique room, 38ft. by 36ft.; modelling-room, 22ft. by 36ft.; and life class-room, 15ft. by 29ft. The old schoolroom has been remodelled, and the space occupied by the old staircase utilised; the accommodation on this floor now consists of an elementary room, 46ft. by 36ft.; architectural and mechanical room, 15ft. by 36ft.; library and designing-room, 13ft. by 14ft.; attendant's room, and ladies' cloak-room. The whole are approached by a new and commodious entrance and staircase, at the rear of which are a casting-room and closets and lavatories. The school will now conveniently accommodate upwards of 200 students. The schoolrooms are ventilated by means of Shillito and Shorland's inlet ventilators and specially constructed windows, and by Messrs. Hill and Hey's siphon outlet ventilators, and are heated by hot water. Mr. Nicholas Bennett, of Burslem, has been the contractor for the additions and alterations. The whole has been erected frem the designs and under the superintendence of Mr. Ralph Dain, architect, of Hanley and Burslem.

HORNSEY.—The Bishop of London consecrated the new church of Holy Trinity, South Hornsey, on Friday, Dec. 31st. It supplies the place of an iron one, lately erected, which was found inadequate for the wants of this vastly increasing suburb. It was designed by Mr. C. B. Terry, 15, Spring-gardens; the builder was Mr. T. Boyce, Hackney. The brass lectern, gas-fittings, Communion-rail, and other furniture were supplied by Jones and Willis, of London and Birmingham.

LEVENSHULME.—The foundation-stone of a new Congregational church was laid at Levenshulme on Saturday last. The church is being erected upon a site adjoining the present school, and is 64ft. long by 43ft. wide, and 49ft. to ridge of roof. Two vestries are placed on the south side. A spire will stand at the north-west angle, the lower stage of which forms the principal entrance to the church, and opens through folding doors into a vestibule which occupies the entire length of the front. Internally the fittings will be of pitch-pine; accommodation being provided for 400 persons. Provision will also be made for the erection of a future gallery, to contain 100 additional seats. Increased class room and other accommodation will also be provided in connection with the present school. The total cost will be about £3,300. The building is being carried out under the superintendence of the architect, Mr. John Lowe, F.R.I.B.A., Manchester; Mr. W. W. Harrison, also of Manchester, being the builder.

The annual prize distribution, in connection with the Norwich School of Art, took place on Wednesday week at the Free Library in that city. It was reported that the school was in a prosperous condition, both as to number of students and finances. An encouraging address was delivered to the students by Mr. Walker, President of the Liverpool Society of Water-Colour Painters, and art referee to the Southport Corporation, who, 30 years ago, was a student in the Norwich school.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

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Correspondence.

PUBLIC GENEROSITY IN COMPETITIONS.

To the Editor of the BUILDING NEWS.

SIR,—One farcical condition in competition instructions is not receiving that consideration which it deserves among those who have already written on this, at present, fruitful theme; we mean the one which states: "If the plans of the first premiated design be adopted, the premium to merge in the commission." As, ninety-nine times out of a hundred, the first premiated plans are adopted, we are lost in wonder at the stupendous moderation of the first premium generally offered. Take the late Liverpool School of Art Competition for instance: the first premium was 100 guineas to be merged in the commission. As the cost of the building was limited to £10,000, the commission would thus be £500. Now, why should the board have been so niggardly as to offer only 100 guineas? Why not have been generous and offered 400 guineas? 300 guineas, more or less, would have been nothing out of their pockets, while a prodigious generosity would have been cheaply obtained.

We commend this suggestion to all future framers of competitions, as, of course, those interested—incipient architects and draughtsmen who have not yet learned to enter a competition, especially one without a referee, unless they know beforehand they are to win—will never detect the fallacy.

The real amount of money awarded by the above board for 96 sets of drawings was the munificent sum of 25 guineas, about five shillings a set, and thus at ten drawings in a set, about sixpence the sheet—the price of the paper without the stretchers.

We believe the large number who entered this competition were induced to do so from the announcement that the drawings would be exhibited.

Most competitors look on such an exhibition as an advertisement, and as such, even if unsuccessful, a remunerative speculation indirectly, especially when the professional journals give them a favourable criticism.

Not to exhibit the drawings was, we think, in this instance, looked on as a great injustice, the labour bestowed being utterly thrown away.

We would suggest as another *sine qua non* in competitions that the drawings be always exhibited.—I am, &c., A. D.

LIVERPOOL SCHOOL OF ART COMPETITION.

SIR,—The thanks of the profession are due to Mr. Walker for exposing the ungenerous treatment which we have received at the hands of the directors of the Liverpool Institute. I certainly accepted Mr. Sharp's statement as a *moral* guarantee that a referee would be appointed, and if, as he asserts, the committee made the selection without favour, could they not have gone a step higher and given the proof-positive of their sincerity towards the profession by seeking the advice of an experienced and eminent architect in arriving at a decision? Such a course could have had no drawbacks in their desire to deal justly, and it would have been a real satisfaction to the large number who responded to their invitation, for while Englishmen can bear defeat, they like to know they have been beaten *fairly*. It is needless for Mr. Sharp to tell the profession that some of the committee had experience in competitions, for no amateur-knowledge is sufficient to grapple successfully with such a large number of competition drawings. While it would be premature to pronounce an opinion on the successful design, the fact of its being conceived in the "Queen Anne" style is an ominous sign that this "Be just and fear not" committee would not have made a great blunder if they had sought the guidance of a ripe and sober judgment.

It is never a healthy sign, and reasonably creates suspicion, when a set of men can't leave their acts to the judgment of the public; and apart from the ungrateful and undignified treatment in refusing competitors the satisfaction of a professional criticism, it has yet to be explained how "Liverpool gentlemen" (as they call themselves in Manchester), can tell people that drawings are packed up and sent off (carriage paid—let us thank them for this generosity) which do not arrive in London for about ten days after.

Liverpool gentlemen! we would not harm you; but need you have treated a liberal response to your invitation scurvily?—I am, &c.

A COMPETITOR.

GLASGOW MUNICIPAL BUILDINGS COMPETITION.

SIR,—I must repeat to "Another Competitor" that the words quoted by him do not forbid blackening windows. An elevation is none the less "in line" because the windows are blackened; and the conditions do not specify that they are to be in line *only*. Colour and etching are excluded, but not blackening. There is no room for doubt as to the meaning of the expression; but the intention of those who drew up the conditions is not equally clear. Several of the competitors accordingly wrote and received private instructions, which can hardly be considered binding on those who heard of them only during the exhibition of competitive drawings. When your correspondent says that "90 competitors out of 96 break rule," he suggests the eleven obstinate jurymen of the anecdote, and casts an undeserved imputation on his profession.—I am, &c., T. L. W.

THE FUTURE OF CEMENT.

SIR,—At the risk of being considered tedious, I must crave a few words more on this subject. Why an observation, which from me is in "bad form," and is "regarded simply as the vapouring of an ambitious would-be cement authority," would have "come with better grace from the President" of the Institution of Civil Engineers, is even less intelligible than the rest of Mr. Reid's latest epistolary effort. Mr. Reid secured a very cautiously-worded notice of his book in the "joint-paper," and he is at liberty to use it to puff his third edition. I am glad he admits his mistake about the formation of a silicate in the humid way. He must really get Mr. W. F. Reid to explain the matter to him a little more fully, however, for he is still foggy on this point. That I am regarded as the "*trade* exponent" of sulphur, selenite, and loam is news to me, though we live and learn. Mr. Reid, when he is facetiously inclined, should try and be more exact—the history of a childhood is not the same as a "child's history."

I wish to take this opportunity of saying that in the paper read at the Institution of Civil Engineers, the paragraph to which Mr. Reid alludes, respecting the nature of Joseph Aspdin's cement, is, when taken in connection with the subsequently-ascertained facts, scarcely just. There can, I think, be no doubt that Aspdin was the first manufacturer of Portland cement, though we have, as stated in the joint-paper, no evidence from his specification that the cement he made in 1824 was identical with what we now call Portland cement. It is satisfactory to learn that Mr. Reid is so much in request by those in search of advice upon matters in which he considers himself so "*experienced.*"—I am, &c.,

GILBERT R. REDGRAVE.

Muswell-hill, N., Jan. 3.

SIR,—With reference to Mr. Reid's remarks in the last number of the BUILDING NEWS, will you allow me to say that no one realises more fully than I do the very great importance of clean aggregates for making concrete, nor has anyone insisted more strongly on this condition being observed on works where Portland cement concrete has been used in very large quantities. I should be glad to know on what authority Mr. Reid makes a statement implying that I am in the habit of allowing dirty or unsuitable material to be used.—I am, &c.,

E. COLSON.

H.M. Dockyard, Portsmouth, Jan. 4.

FIGURES IN GLOUCESTER CATHEDRAL.

SIR,—Can you, or any of your numerous correspondents, inform me with reference to the figures in the reredos of the high altar in Gloucester Cathedral, which was erected some few years since, from the designs and under the supervision of the late Sir Gilbert Scott; whether they are not still simply the original plaster models doing duty for the sculptured marble ones originally intended?

It is stated that the plaster figures have never been removed; but if this statement is incorrect, I should, for one, be glad to be told so, as I believe marble figures were paid for.—I am, &c.

ONE IN DOUBT.

ST. MARK'S, VENICE, AND THE INSTITUTE.

SIR,—Scarcely recovered from the shock of last night at the Institute, I hasten to note, for the benefit of your readers who were not present, the harrowing scene which took place there in connection with St. Mark's, Venice.

After the first portion of the business was completed, there were those signs of restlessness, those whisperings and murmurings, which precede, in meetings, some important communication from the leaders; members huddled together as if for mutual support during the ordeal, the president was graver than usual, the secretary looked defiant—more defiant than ever, and when the hon. secretary rose, one could have heard a crowbar fall. With a printed paper trembling in his hands, and with quivering lip, he read extracts from a circular by Mr. Street, the purport of which I gathered was to invite members to sign a memorial praying that further works at St. Mark's be at once stopped. This ultimatum was received with smothered, but warlike excitement; it required but the word to hurl deadly combat at the Venetians, and the fierce gladiators were only kept back by the paragraph in the circular which advocated calmness

and mercy, and expressed the desire that nothing should be done to wound the susceptibilities of the dire foe. Staggering to his seat, the hon. sec. breathed again, and probably a respite would have been granted—but No! in an instant darted up an old warrior, hissing rage; he had only just returned from St. Mark's, he had the blood-thirst still warm; he had witnessed with the aid of powerful glasses the bloody works going on at unhappy St. Mark's, and back came the desire of every owner of stout heart and arm to rush upon the perpetrators: the sword-hilts were grasped when this old warrior just returned from St. Mark's related how it nearly happened that the west front would be brought out from six to twelve inches, resulting, of course, in an entire rebuilding. How thereby all the "irregularities," all the "wavy lines," all the small pieces of stones," all the results, in fact, of bad setting out and careless workmanship, would be for ever lost. How in one instance where there were some small pieces of marble casing, "single sheets" of marble had been substituted, and how some old paving with "wavy lines" had been taken up, and new paving (he didn't know whether the pattern was the same or not) with straight lines laid in place. The sturdy little Briton had now worked his hearers into the requisite pitch of excitement, and when the last foul deed was recited—when, with distended nostrils, he told how certain capitals were left unprotected, while wretched hirelings were banging away, and brickwork tumbling down; and reached his climax by saying that he had seen *one* capital chipped—then he had lost all command of the band, which thereupon swore death or glory at the west front of St. Mark's. This mighty harangue of the old hero had cost him exertion; fainter and fainter grew his faltering notes until he sank with the words: "Stop the works for ever; leave all cracks as they are; leave the irregularities; leave the wavy lines; leave it all alone," and live or die in the determination to preserve intact the west front of St. Mark's.

Precisely so, Messrs. Ewan Christian and George Edmund Street; and is not that desire to pressure intact the Church of St. Mark as dominant in Venetian architects as in yourselves? And if not, are you to dictate to foreign governments and foreign architects as to the necessity or otherwise of taking precautions to uphold, alter, restore, or rebuild any particular structure they may desire should be so dealt with? Are your views, even with the aid of powerful glasses, to be thrust upon other countries, as to whether a building stated to be unstable by local architects employed for the purpose, is, or is not, in want of attention? Is it because you choose to take under your protection "wavy lines," "small pieces," "irregular work," and other funny things in that jumbled up west front, with columns having bad capitals carrying nothing, with a balcony as incongruous as it could be, with proportions and details as offensive as possible, and all intermixed with silly sculpture, that you ask members of the Institute to help you in your indelicate work? Would English architects like French architects, after visiting London, to go back and write insane letters to the *Times* about matters which properly are and should be left to English architects? Could not a man just returned from the London Law Courts address his Venetian brethren, and pray that the attention of the English Government should be called to the many things there, inside and outside, which, in his opinion, should be altered, and the works in progress stopped? Could he not ask why that piece of circular insipidity at the corner of the Northumberland-avenue was allowed to be erected; and could not somebody say, "Because it was to help Drummond's Bank"? And what about the best sites at the west of London being covered with pieces of embodied ugliness called Queen Anne architecture? What about some scores of other buildings which might be named, wretched responses to wretched fashion? What about so-called fine art in the drawing-room, such a "corner" as that recently illustrated as the work of Mr. Edis—another example of faddy-fashion? I suppose any circular on these little matters issued by a foreign institute would be considered impertinent by London architects; and if Mr. Christian is so fond of "wavy lines" and "small pieces," why does he not execute them in his buildings? That building of his in Bridge-street, Blackfriars (which, I am sure, we all admire), is not absolutely covered with wavy lines, and the stones are very much bedded and jointed, as customary; then let practice follow precept. I don't know that much more can be done in the way of "bits" at the Law Courts; but perhaps we can have them in other works.

I conclude, Sir, with the earnest wish that the members of the Institute will abstain from committing themselves to any protest, circular or otherwise, which would convey imputations that our Venetian brethren are incompetent, and that when they report that St. Mark's is in need of reparation, restoration, or rebuilding in parts, they so report in order to get a job, and that the only man who really knows what is required is Mr. George Edmund Street. As a member of the Institute, I should not dare to become a party to so insolent a piece of meddling; and I hope that members will show their disapprobation of the whole affair by withholding their signatures from any circular which may be sent to them.—I am, &c.,

January 4. WM. WOODWARD.

Intercommunication.

QUESTIONS.

[6345.]—**Surveyor's Charges.**—What are the fair and customary charges for taking out quantities and making estimate, from architect's drawings and specification, for a builder, when his tender is accepted? Also, what is a fair charge for making an estimate, when the architect or his surveyor supplies quantities, to the builder, if his tender be accepted? I am often called on to take out quantities and make estimates for builders, taking no risk nor being responsible for accuracy. I do not know what is a fair charge for so doing. If I charge 2½ per cent. when the builder is successful I am told it is too much, and am offered 1 per cent., which I think is too little. Will some builder's surveyor give me his opinion?—QUANTITY SURVEYOR.

[6346.]—**Landscape Gardening.**—If any reader could give the name of a small work on the above it would greatly oblige.—OVAL.

[6347.]—**Perspective Drawing.**—Which is the best book treating on the above in its application to the requirements of architecture?—H. K. A.

[6348.]—**Organ in Trinity College Chapel, Dublin.**—Will some reader kindly give specification and brief description of this instrument?—INQUIRER.

[6349.]—**Violin.**—Inside one which cost a friend £25 more than half a century ago is "Ignatio Bentze in Italia a Croemona." Any information regarding this maker or his merits will be welcomed by—INQUIRER.

[6350.]—**Surveying.**—Will some reader oblige by answering the following:—A field is separated from a country high road by the usual hedge and ditch, the ditch on the road side. Would the centre of the hedge be the boundary line?—Z. Y. X.

[6351.]—**Openings.**—Having just completed a large job where openings are not deducted, the proprietor objects to allow me to take the following opening, 22 by 20, for stage. The walls to opening are plastered on both sides, and from stage to floor 5ft. The room is 86 by 34, and 26ft. high; also in corridor, 100ft. by 15ft., he objects to the following openings being taken: 6ft. by 37ft., also 12ft. by 6ft., also 8ft. by 22ft., also 13ft. by 10ft. Will you kindly insert this in your valuable paper, as myself and proprietor and architect have agreed to accept the answer given therein.—ROMBALD.

[6352.]—**Wall.**—To what height would it be necessary to build a 9in. brick wall, 15ft. long, before the superstructural weight would crush the bottom course of brickwork, supposing it could be done? I have an argument about this, and should be thankful for any information, the kind of bricks used being kiln.—LEO.

[6353.]—**Orientation.**—Apropos of your article in last week's BUILDING NEWS on "Orientation," have any of your readers noticed (1) how far the private chapels attached to the old manor-houses in various parts of the country orientate? (2) Also if the manor houses themselves commonly follow the points of the compass. Some instances in Lancashire and Cheshire have been pointed out in "Notes on Sketching Tours," recently published by Batsford. Can instances be quoted in other parts of the country?—J. M. G.

REPLIES.

[6343.]—**Water Tests.**—The fundamental principle of the ordinary method of ascertaining the relative hardness of water is the fact that hard waters require more soap to form a lather than soft ones. A measured quantity, therefore, say, 70 cubic centimetres of the water in question is put into a stoppered bottle which has been carefully rinsed with distilled water, and an alcoholic solution of soap of exactly known strength is added from a graduated glass measure called a burette, until the mixture, on shaking up, forms all over its surface a lather which will last for five minutes. The quantity of soap solution added is then read off, and the hardness of the water can be calculated from the amount of soap used. The hardness of water is due to the decomposition of soap by certain salts of lime and magnesia held in solusolution, and as a fixed quantity of soap is decomposed by a fixed quantity of these salts, the more of them a water contains the more soap is decomposed before any can dissolve and remain unacted upon so as to produce a good lather. The number of measures of soap solution used by a gallon of a water is its number of degrees of hardness. Seventy cubic centimetres of water weigh 70,0.0 milligrammes, and one gallon weighs 70,000 grains, therefore 70 cubic centimetres may be considered a miniature gallon, and it is a convenient quantity to take, as a gallon would be too bulky to work with. Professor Wanklyn recommends that the solution of soap should be made of such a strength that one cubic centimeter will contain just enough soap to be acted on by one milligram of carbonate of lime. This is done by dissolving 10 grammes of Castile soap in one litre of weak alcohol, of about 35 per cent. in strength. All the soap must be dissolved, and the solution well shaken up. Now, if 70 cubic centimetres of a water took 5 cubic centimetres of this "soap test" it would have 5 degrees of hardness, 70 cubic centimetres of another water taking 8 cubic centimetres of the soap solution would indicate 8 degrees of hardness, and so on. The foregoing is a partial outline of the process for determining hardness given in Wanklyn's "Water Adalysis," but as I dare not take up too much space, the outline here given makes no mention of the various practical details of the method. With regard to the second question of "Juventus," I may safely say that there are no really simple and, at the same time, reliable tests as to whether any particular water is fit or unfit for human consumption. To quite satisfactorily solve such a problem necessitates the employment of many and difficult scientific processes which can only be carried out by those who have had long training in analytical chemistry. The quantity of foreign matter present even in waters which may be most deadly in their effects on the animal system is so minute that water analysis constitutes one of the most delicate and difficult branches of chemical science, and cannot yet be said to be in a thoroughly satisfactory condition. The greatest chemists have differed and do differ on the respective merits of the best processes at our command, and it is very obvious that if there were any good and simple test of the kind asked for by "Juventus," the complicated processes, expensive apparatus, and voluminous literature connected with water analysis would be useless, and without any raison d'être. The third question can be more easily answered. Iron, lead, and copper, if present in water, even in minute quantities, may be easily tested for by adding a few drops of ammonium sulphide solution to about 100 cubic centimetres of the water, which should be in a white porcelain dish or bason If a brown or black colouration is produced which does not disappear on the addition of a drop of pure hydrochloric acid, either lead or copper is present, and the water should be absolutely condemned. If the colouration disappears on the addition of the acid, it is due to iron, and in this case, supposing the colour to have been originally only just visible, no notice need be taken, as a trace of iron is for most purposes unimportant. There is no special test for urine, but the presence of a large amount of free ammonia in water is, to a great extent, indicative of urinous (especially) and other organic contamination, and the best test for ammonia is that called Nessler's test, which, on being added to a water containing much free ammonia, would impart a sherry-coloured tint, or, if the contamination were excessive, a brown precipitate. The water-testing apparatus at a guinea and half a guinea, sold by the London and General Purifying Company, 157, Strand, W.C., contains simple tests, with directions, for the most usual impurities in water, and, as far as it goes, would probably meet the requirements of "Juventus." By its aid he could condemn any thoroughly bad waters, but I cannot too strongly urge that, as regards the vast majority of waters one meets with, no process short of a regular analysis would quite reliably enable one to decide upon their safeness or the reverse.—EDWY G. CLAYTON, Analytical Chemist and Assoc. Socy. Public Analysts.

CHIPS.

At the Lancashire Quarter Sessions, held on Thursday week, the sums of £20,500, £11,000, and £8,850 were voted for the erection of a new annexe at the several lunatic asylums at Whittingham, Prestwich, and Lancaster respectively, and £12,000 for the purchase of a site in Islington-flags, Liverpool, for the erection thereon of a sessional court-house for that city.

Two of the works which were contributed to the present exhibition at the Grosvenor Gallery, have been purchased by the South Kensington Museum for the nation.

The Institution of Civil Engineers, which was established for the promotion of mechanical science, has just entered upon its sixty-fourth year. According to a list corrected to the 2nd inst., it now numbers 3.839 of all classes, distributed thus:—members, 1,231; associate members, 1,335; associates, 569; honorary members, 18: and students, 686.

A new coffee-tavern, in the High-street, Deptford, belonging to the United Kingdom Coffee-Taverns Co., was opened on Thursday week.

The cap-stone of the spire of Christ Church, Leeson-park, Dublin, was laid by the Rev. Dr. Neligan, on Wednesday week. The church was built between 1859 and 1863, with the exception of the spire, from the designs of Mr. Rawson Carroll. The new tower has a belfry in the upper stage, with four double-light windows with pointed and cusped heads; at present it contains no bells. Over this is a broach spire having a range of lucerne lights, and above these quatrefoil perforations, and the total height from ground to copper terminal is 150ft. The materials are chiselled Ballyknocken granite, and limestone dressings. Mr. Rawson Carroll was the architect, and Mr. Bolton the contractor.

The Devonport borough prison has been sold to Mr. John Martin, builder, for £5,500.

LEGAL INTELLIGENCE.

THE DANGEROUS CHIMNEY AT THE CRITERION.—On Wednesday the dispute about the degree of stability of the Criterion chimney-stalk again occupied the magistrate at the Marlborough-street police-court. Mr. Cooke was on the bench, and showed some reluctance to adjudicate in a case with which Mr. Newton had previously dealt; but on it being admitted by both parties that Mr. Newton's order could not be carried out, as it was against the builder of the chimney, out of whose hands the building had completely passed, Mr. Cooke consented to hear and decide upon the case on its merits. Mr. Napier appeared for the Board of Works, and Mr. Bigham (barrister) for Messrs. Spiers and Pond. The argument of the summons was "to take down the new chimney-stalk on the building to the extent of four feet on the top thereof; or, otherwise, to stay and support the said chimney-stalk (leaving it at its present height) by means of an additional stay of H iron, nine inches deep, properly secured at the foot, and attached to the chimney-stalk at the head by a proper iron stretcher." Mr. Robert Kerr, district surveyor of St. James, said this chimney was erected in May, 1879, without notice being given to him. An application was promised by the builder to the Metropolitan Board of Works for its sanction, but it was not made. In October, 1879, notice was given by the district surveyor to have the work amended. Nothing was done. In November of that year there was a summons of the builder to the police court, with its adjournments. In January, 1880, the case was heard before Mr. Mansfield, and referred to the Metropolitan Board of Works. Doubts were felt as to the Criterion being a public building, and, therefore, as to the applicability of the Act. Mr. Mansfield decided this affirmatively. In May, 1880, the Metropolitan Board of works decided that an iron stay should be put up. In June there was a notice given by the district surveyor to the builder to amend his work according to this decision. It was not amended. In July there was a second summons to the police-court. One case was adjourned *sine die* by consent. The other was heard by Mr. Newton, and an order was made in terms of the Metropolitan Board's decision. In August the written order was delivered by the police. Mr. Verity, the architect, told the district surveyor he would not obey it. On Nov. 27, an information was laid by the district surveyor that this chimney was a dangerous structure. On December 1 it was condemned as dangerous, and hence the summons (No. 3) to the police-court. The Building Act, Section 20, sub-section 10, implied the danger, and so did the decisions of the Metropolitan Board, after an exhaustive hearing of the case, and the decision of Mr. Newton. He (Mr. Kerr) had repeatedly examined the chimney, and he pronounced it to be a dangerous structure in respect of its excessive height. It was four or five feet higher than it should be by statute, and was only supported by four strings of copper rope. He had had no end of trouble over it. As he had indicated, it had been in this court about 19 times. The statutory height of a chimney was six times the width in a private building. This was a public building, but he could not conceive that the legislature of this country would lay down a rule for the height of a chimney attached to an ordinary dwelling-house and allow it to be disregarded in regard to a public building. Mr. Kerr added that the width of this chimney was 4ft., and its height should consequently be 24ft. He had got an order upon the builder to take it down to 24ft. above the roof, but had taken no steps to put it in force, as he found the builder had no longer any power in the matter. The brickwork of the chimney was built round iron pipes, and could not therefore be as stable as ordinary work. In cross-examination, Mr. Kerr admitted that when he received on the 30th November an order from the Board of Works to survey and report on this chimney, he did not make a close survey from the roof of the Criterion before sending in his report; but he explained that the reason of this was that he had several times previously made a very close survey, and knew, on Dec. 1st, by merely looking at the chimney, that it was in the same condition as he had before found fault with. Mr. Robert Walker said he was district surveyor on the other side of the Haymarket. He had seen the chimney-stalk in question, and he agreed with the last witness in considering it to be a dangerous structure. Cross-examined, he said he had seen the chimney-stalk from the roofs of adjacent buildings. Asked why he regarded it so intently, as now to be able to volunteer evidence about it; he said the chimney was a matter of notoriety amongst the architects of the metropolis. The Grand Hotel, at Charing Cross, had built one like it, but had been compelled to take it down 15ft. Being asked if his readiness in volunteering evidence adverse to Mr. Verity, the architect of this building, did not arise from his unsuccessful attempts against the owners of other buildings erected by that gentleman, he said he had never taken proceedings against Mr. Verity in his life, and indeed he had never taken proceedings against anybody which were unsuccessful. Mr. Bigham then addressed the Court, contending that the preliminary steps necessary to secure the hearing of this case had not been taken. This application was made under sections 69 to 74 of the Building Act, and they provided that whenever it was made known to the commissioners under it that any structure was in a dangerous state, such commissioners should require a survey to be made by the district surveyor, and that it should be the duty of the district surveyor to make known to the commissioners any information he might receive in regard to any structure. He submitted that Mr. Kerr had not made a survey within the meaning of the Act between the date (Nov. 30) of receiving the order to survey the chimney and the date (Dec. 1) of writing his report on it. Mr. Cooke remarked that the Act was clear on the point that the information must be made to the commissioners, and then the commissioners ordered a survey. Mr. Bigham said the first document was the information given by Mr. Kerr, and the second the requisition by the board to Mr. Kerr to make a survey. The next document was the survey; but in this case it was proved that there had been no survey in obedience to the requisition. Mr. Cooke said he would take it that a survey had been made. Mr. Bigham: Between Nov. 30 and Dec. 1? Mr. Cooke: Yes; there was a certificate before him that Mr. Carr had made it and he received the certificate. Mr. Bigham pointed out that Mr. Kerr had admitted that it was probable he had not made a close survey at that time, giving, as his reason, that he had seen the place frequently before. Between 30th Nov. and 1st Dec., if he looked at the chimney at all it was only from the ground. Though the chimney was now in the same condition as it was in 1879, the district surveyor thought it so little of a dangerous structure that he had allowed it to remain more than a year before he took proceedings under that portion of the Act which related to dangerous structures. He (Mr. Bigham) held that there had been no survey at all. Mr. Cooke ruled that there had been a survey, saying that he had a certificate to that effect before him, and that it was not his duty to inquire how the district surveyor had made it. Mr. Bigham's proper course was to call evidence, if he had any, to show that the district surveyor had made some mistake about it. If he showed that then it would have some weight with him. Mr. Verity, the architect of the Criterion, was then called. He said the main building was erected in 1873, and what was called the Annex, of which this chimney was a part, in 1879. The greater part of the heat from the premises below was conducted up a flue which had no connection with the chimney-stalk. The chimney was in no danger from a high wind. The guy-ropes were put up twelve months ago because the district surveyor was so uneasy about the chimney. In reply to Mr. Cooke, the witness admitted that the chimney was 3½ft. higher than the statute would allow in a private building; but the Criterion was a public building. Being asked how, if such a height of chimney constituted a dangerous structure in a private building, the same thing was not dangerous in a public one, he said it did not follow that because the statute prescribed a certain height it was dangerous to go higher. In reply to Mr. Bigham, he said the part of the Act which had reference to private buildings contemplated appearance as well as safety. Mr. Woodthorpe, a district surveyor, who made some demur against being examined at all, as he must express an opinion against his employers, the Metropolitan Board, said, at last, that he had surveyed the chimney, and could not term it a dangerous structure. He admitted that it would be better if a few feet were taken off it, and thought that the defendants ought to attend to the orders of the Board and the magistrates in this. Mr. Harvey, architect, declared that it was impossible to make a satisfactory survey of this chimney from an adjoining roof. He had made a close survey of it, and there was no reason whatever for suggesting that it was a dangerous structure. Mr. Cooke recognised that the Criterion was a public building, inasmuch as there was a theatre in it. It seemed to him that there should be something done in regard to this chimney. The certificate spoke of it as a dangerous structure, and the summons called upon the owner to either reduce the height by four feet or to give it some further support. These proceedings seemed to have been going on for more than a year. He could not understand why the matter might not have been settled in a satisfactory way without all this litigation. He feared that some feeling had been introduced into the case. It was in the public good that some reduction should be made in the height of the chimney or some other support given to it. What guided him very much in coming to this decision was that the first portion of the Act fixed the height 3½ft., at all events below the height of this chimney, even on the admission of Mr. Verity. The learned counsel, who saw the effect of the admission, asked him if the Act did not apply to the appearance as well as to the safety of the buildings. [He (Mr. Cooke) hardly thought that appearance was much considered in dealing with chimneys. When the Act fixed the maximum height of a chimney, there must be good and sufficient reason for doing so. If there had never been any other examination than the last one made by Mr. Kerr, he would have certainly rejected his report; but it appeared that Mr. Kerr was perfectly conversant with the chimney, and if he made an apparently superficial examination on the last occasion, he had made thorough examinations of it before. He (Mr. Cooke) therefore made an order, in terms of the summons, to be executed within a month.

CHIPS.

New board-schools, masters' residence, &c., Wheatley Hill, Durham, were opened on Wednesday week. They have been built by Mr. J. Perks, contractor, Stockton-on-Tees, from designs and under the supervision of Messrs. Weatherill and Moses, Stockton-on-Tees, architects to the board.

The whole of the facing bricks, rubbers, also the moulded bricks and the tiles for the roof for Westwood House, Sydenham, illustrated by us on Dec. 24th, were supplied by Mr. T. Lawrence, of Bracknell, Berks. The facing bricks are his picked hand-pressed; the moulded bricks were made specially for this job, and so were the tiles, and the carved work is done with rubber bricks.

A stained-glass memorial-window has just been placed at the east end of St. John's Church, Deptford. The centre contains a full-length figure of the patron saint, and beneath he is represented in the Isle of Patmos receiving the Book from the Angel. On the left are representations of the parables of the Talents and the Good Samaritan, and on the right the parables of the Ten Virgins, and the Prodigal Son.

The Dundee town council last week had under consideration the plans and Bill for the new Tay-bridge. They decided to recommend Parliament to make the height of the bridge 40ft. above high-water level instead of 77ft., as proposed in the Bill, and will take steps to secure the co-operation of the burghs interested in seeing that the new structure is a thoroughly substantial one to attain the object in view.

Foundation-stones of Saron Welsh Congregational Chapel were laid at Nant, near Minera, on the 14th ult.

A large building, recently erected at Bohemia, Hastings, for the members of St. Paul's Working Men's Club, was opened on Wednesday week. Mr. W. J. Gant was the architect, and Messrs. Russell were the builders.

Mr. John M'Crae, at present superintendent of the gasworks at Bury St. Edmund's, has been appointed manager of the Dundee gasworks, in succession to his father, Mr. Boyd M. M'Crae, deceased.

A cottage hospital, erected at Keith, N.B., as a memorial of the late Dr. Turner, was opened on Friday last. It has been erected at a cost of £1,500, including furnishing. The architect was Mr. Robertson.

The bells of Dawlish-church have been rehung, and new chiming apparatus provided, by Mr. Aggett, of Chagford.

The corporation of Rochester have obtained the sanction of the Local Government Board to borrow £3,219, to be repaid in 15 years, and of £1,590, to be repaid in 5 years, for paving and channeling the streets in the outlying districts of the city.

Alderman George Moyers, LL.D., who was sworn in as Lord Mayor of Dublin, on New Year's Day, is a builder in extensive business at Portobello, a southern suburb of that city.

The new Skeldergate-bridge, at York, was opened to foot-passengers on New Year's Day, and will soon be available for wheel traffic. It was built at a cost, for bridge and apparatus, of between £40,000 and £50,000. It is of iron, in three spans, one of 90ft., and two side ones of 30ft. each, one of the latter, that next the city, opening to allow of the passage of masted vessels. There are also two land arches of 24ft. span each. The consulting engineer was Mr. George Gordon Page, C.E., of London, and the resident engineer, Mr. R. Munn, who acted in conjunction with Mr. Hyan, city surveyor. Messrs. Handyside and Co., Derby, supplied the ironwork, and Sir William Armstrong and Co. provided the hydraulic machinery, by which the machinery of the bascule-bridge is moved. We illustrated the original design by a perspective and detail drawings on May 24, 1878, and the amended design by a perspective on June 25, 1880.

Our Office Table.

A REPORT has oozed out from the inquiry which Lord Derby and his colleagues are now prosecuting, to the effect that in 12 years the trust property of the City Companies or Guilds has increased upwards of £100,000 a year. It may be observed that this is a fact which intimately concerns the arts and industries. From it we learn that if for the promotion of technical education we had but the increment of the last dozen years, we should have an income of £100,000 a year, and if this splendid sum is compared with the income which these Guilds have voluntarily contributed to the proposed Technical College at South Kensington, it will be seen how large is the difference between what they propose to do and what they ought to do.

MR. HENRY R. WORTHINGTON, one of the most prominent hydraulic engineers in America, died Dec. 17, 1880, at New York, after a very brief illness, at the age of 63 years. Mr. Worthington was a native of Brooklyn. He engaged in mechanical pursuits at an early age, and became a hydraulic engineer while a very young man. His success in his profession was marked, and he invented a number of important improvements in hydraulic machinery. He constructed the pumping machinery for the waterworks of a great many cities, including that for the new high-service works at 97th-street, and Tenth-avenue. He maintained an office at No. 239, Broadway, and was also President of the Nason Manufacturing Company. He was Vice President of the American Society of Mechanical Engineers, which he assisted to found, and was a member of the Society of Civil Engineers.

THE REV. FREDERICK JAMES JOBSON, D.D., who was president of the Wesleyan Conference in 1869, and for many years chief at the Conference office, died on Tuesday moring. He was seized with paralysis on Christmas-eve. He was born at Lincoln in 1812, and articled to Mr. Willson, F.S.A., an architect of that city. He became a minister in 1834, and filled some of the most important posts in the Methodist body, having been officially connected with chapel building and schools for minister's sons, the theological institution, the relief and extension funds, and day-school education, and acted as clerical treasurer for the Foreign Missionary Society. In 1869 he was elected president of the Wesleyan Conference for the ensuing year. In addition to several devotional works which attained success in Methodist literature, Dr. Jobson published "Chapel and School Architecture as Appropriate to the Buildings of Nonconformists," 1850; "America and American Methodism," 1857; and "Australia, with Notes by the Way on Egypt, Ceylon, Bombay, and the Holy Land, 1862."

A COMMUNICATION on the subject of Boulder Stones as Gravestones was read at the last meeting of the Manchester Literary and Philosophical Society by Mr. E. W. Binney, the president. Mr. Binney said that in the numerous excavations made in the drift deposits large boulder stones are often met with, and cause a good deal of trouble to the workmen. They are glad to get quit of them somehow or other. Blasting them with gunpowder or dynamite, or burying them near to the place where they have been found, have been generally employed. Latterly it has become the fashion to remove them to public parks in order to preserve them; and fine specimens may be seen in those places at Manchester, Salford, Oldham, and Macclesfield, where they are not only preserved, but exposed to public attention. He (the president), when visiting Ashton-under-Lyne the other day, observed another use to which boulder stones had been applied. There in the churchyard in the Manchester-road a greenstone boulder, instead of being buried as was formerly the custom, is now used as a tombstone over the grave of a son of an Alderman of that borough. This is the first instance where he had seen a boulder stone used for such a purpose, and it is one where they may not only be preserved, but exhibited to the public. Over the grave of the late Mr. Locke, the railway engineer, in Kensal Green Cemetery, is a block of red granite, but although plain, he thinks it is not a boulder like the one at Ashton-under-Lyne.

IF a man wants to build a wall or a house in Cyprus, according to the *St. James's Gazette*, he begins by making a hole in his garden. Shovelling up and sifting the earth, he adds chopped straw; his wife helps and throws water on the mixture, which is worked up until it is thick enough to form into flat slabs. These are moulded with the hands, with or without the help of a rough wooden frame. It is not without significance as to the low value put upon labour, and the perfectly rudimentary state in which some of the crafts of this old island still remain, that the masons may be seen working mortar with the hands, and so carrying it up a ladder, or placing it on the stones without the aid of hod or trowel. The thick walls built of the mud slabs and the flat mud roofs form an admirable sun-fence; but no sooner are they erected than sun, wind, and rain, all violent of their kind, commence a rapid course of destruction; and, as repairs are seldom undertaken, most of the small houses and their enclosures have already become, or are, in the perfectly accurate language of Job, ready to become, heaps. The "ruinous heaps" an dilapidated walls are washed by the torrents, and encumber the uneven, up and down tortuous lanes and alleys with dirt and dust. In a thunderstorm in November, 1880, five houses together were resolved into their native elements in Limasol. The aspect of such a town or village is of one uniform dead hue of mud, and must be seen in order to fully understand the "beating down" and the "merciless ploughing" of the ancient conquerer, and the sowing of "barren salt" over the ruins of a "fenced city."

THE death is announced, at the age of 79, of Mr. John Parker, of Wycombe, an antiquary of great local reputation. Mr. Parker's chief work was his "Early History and Antiquities of Wycombe," which was published by subscription in 1878. The preparations for this book, which displays great learning and research, occupied the greater part of Mr. Parker's latter years. The subject was congenial to him, and, from the antiquity and many historical associations of the borough of Wycombe, more interesting to the outside public than the books of antiquaries are wont to be. Mr. Parker was by profession a solicitor, and was at one time town clerk and for many years clerk to the borough magistrates at Wycombe.

LAST week the Duke of Portland gave a supper to abont 80 of the workmen employed at Welbeck, who have been working for months past on the restoration of the Abbey. Mr. Tinker, the clerk of works, proposed the health of the Duke of Portland, coupled with Lady Bolsover and the other members of the family. The Duke responding, proposed the health of Mr. Tinker, coupled with the names of Mr. Collingham and Mr. John Stubbings, for whom all gave three hearty cheers. The company afterwards drank the health of Mr. Turner, agent, and Mr. M'Callum, steward; and having spent a very pleasant evening, broke up about 10 o'clock.

MR. G. F. ANSELL, the inventor of the firedamp indicator, who died on the 21st ult., has recently applied the principle of that apparatus to the production of an instrument for the detection of gas leaks. The action of Mr. Ansell's firedamp indicator is founded on the fact, that different gases have different rates of diffusion through a porous body, the velocities of diffusion being inversely as the square roots of the respective densities of the gases. In the gas leak indicator, this property is taken advantage of as follows:—A small chamber is provided, having its back formed by a disc of terra-cotta, this chamber being provided with a small stop-cock, by which its interior can be placed in communication with the outer air. If, when this stop-cock is closed, the indicator be taken into a room where a gas leakage exists, the gas, in virtue of the above named law of diffusion, enters the chamber through the terra-cotta disc more rapidly than the enclosed air escapes, and the pressure in the chamber consequently rises. This increase of pressure is utilised to move a hand on a dial at the front of the instrument, each pressure corresponding to a certain percentage of gas in the atmosphere in which the indicator is placed. The dial is graduated from 0, to 35 per cent. of gas, and is moreover marked to show when the mixture is, and is not explosive.

ABOUT six months ago, Messrs. Tangye, engineers, of Birmingham, offered to subscribe a sum of £10,000 towards the erection of an Art Gallery, on condition that the Town Council would vote for the erection of the Art Gallery and an Industrial Museum, and that a further sum of £5,000 was obtained by public subscription. On Tuesday at the meeting of the Council, it was announced that a sum of £6,500 had been subscribed or promised. The Council, who had previously given their sanction for the establishment of an Art Gallery, passed a vote of thanks to Messrs. Tangye for their munificent gift. The Art Gallery will be situated in the Council-house, and already many presents of valuable works of art have been made.

To make shoe-pegs enough for American use consumes annually 100,000 cords of timber, and to make the lucifer matches, 300,000 cubic feet of the best pine are required every year. Lasts and boot-trees take 500,000 cords of birch, beech, and maple, and the handles of tools 500,000 more. The baking of bricks consumes 2,000,000 cords of wood, or what would cover with forest about 50,000 acres of land. Telegraph poles already up represent 800,000 trees, and their annual repair consumes about 300,000 more. The ties for railroads consume annually thirty years' growth of 75,000 acres, and to fence the railroad would cost 45,000,000dols., with a yearly expenditure of 15,000,000dols. for repairs. These are some of the ways in which American forest are going. There are others; packing boxes, for instance, cost, in 1874, 12,000,000dols. while the timber used each year in making wagons and agricultural implements is valued at more than 100,000,000dols.

A MEETING is to be held this afternoon at the Mansion House, at 3 p.m., under the presidency of the Right Hon. the Lord Mayor, to consider the present smoky condition of the atmosphere of London, which injuriously affects the health and happiness of the community, beside destroying public buildings, deteriorating perishable fabrics, and entailing in various ways unnecessary expenditure, and promote the best means of remedying this evil. The Joint Committee of the National Health and Kyrle Societies have arranged, by permission of Her Majesty's Commissioners for the Exhibition of 1851, of the Lords of the Committee of Council on Education, and of the Council of the Royal Horticultural Society, to hold an exhibition (open to Foreign as well as British competition) in the buildings erected for the International Exhibition of 1862, of the various smokeless coals and other fuels, and of various appliances applicable to household and manufacturing purposes for the reduction of smoke, and to test the same, in order to demonstrate for public information the means practicably available to secure that object. The Committee are of opinion that such investigation and testing should precede any application for amendment of the existing smoke acts, or for new legislation in regard to smoke from dwelling houses. Resolutions will be proposed in furtherance of these objects.

A CORRESPONDENT of the *West Sussex Gazette* writes: The intelligence of the decease of the Rev. Mackenzie E. C. Walcott will be received with great regret by those who knew him. Appointed to the Precentorship by Bishop Gilbert, on the death of Dr. Rowden, he soon created a circle of friends by his kindness, courtesy, and varied talents. In addition to his fine voice and love of music, he was an eloquent extempore preacher, whose sermons always riveted attention. He immediately interested himself in the history and antiquities of Sussex, and thought no amount of research too great as to the archæology of Chichester and its neighbourhood. His "Memorials of Chichester," published in 1865, and "History of the Bishops of Chichester, from Stigand to Sherborne," in the collections of the Sussex Archæological Society, are evidences of his unwearying industry. In kindred pursuits Precentor Walcott was ever ready to aid coadjutors, both with his pen and with his facile pencil. His knowledge of heraldry was accurate, and few could decipher mediæval MSS. with equal ease. Amongst his many works, may be specially mentioned "Cathedralia," "The English Ordinal," "Interior of a Gothic Minster," and "William of Wykeham and his Colleges." The latter, written thoroughly *con amore*, and as illustrating the scenes in which he delighted in his boyhood, is perhaps his best production. As that of a scholar of high culture, refined taste, and pleasant manner, the death of Precentor Walcott is a loss to West Sussex much to be deplored. The same journal, in mentioning that Mr. Walcott became Pre-

bendary of Oving and Precentor of Chichester in 1863, explains that the precentor ranks in the cathedral next after the dean; but that it is at Chichester purely an honorary dignity, the duties which usually fall to the precentor being at Chichester discharged by the Succentor.

PART IX. of "Gloucestershire Notes and Queries" edited by Rev. B. H. Blacker, M.A., contains as usual, a variety of matter of special interest to the antiquary. On p. 295 is a quotation on the Source of the Thames, from which it appears that the cabmen of Cheltenham, anxious for the custom of visitors, "are fain to represent that the head of the Thames is to be found within a five-miles drive of that town at a place called 'Seven Springs,' in the parish of Cubberley." But this source is the head of a tributary stream, known by the name of Churn, as shown by Leland's remarks. In note cccxiv., mention is made of a paper, illustrated, on "Architectural Notes in the Neighbourhood of Cheltenham," in the *Archæological Journal*, Vol. IV., by J. L. Petit, the well-known architectural critic and author of "Notes on Continental Architecture." The quotation given is apropos; Mr. Petit therein directs attention of the antiquary who may visit Cheltenham to the village churches within his reach, where curious architectural features and valuable specimens of decoration, painted glass, tiles, woodwork, &c., will amply reward research. Following, is a quotation from the the Rev. H. Hayman's "Historical Memories and Tewkesbury Abbey" in the *Antiquary* of March last, in which the writer conjectures the opinion that the large window recess once had a group of Norman lancet windows, and appeals to the Freemasons of the kingdom, for help to restore the west front. What will the S.P.A.M. say to the suggestion? Among other interesting matter, we find something on the largest oak in Britain, extracts from parish registers of Cheltenham and Tetbury, indices to monumental inscriptions, and some gleanings about Colston's House at Mortlake.

CHIPS.

A stained-glass window has just been placed in the north aisle of St. Andrew's Church, Plymouth, in memory of Mr. John Kelly. It is fifteenth-century in style, and the lights are devoted to large single-figure emblematic illustrations of Abraham represented as bearing the knife in his hand, Isaac with a bundle of wood, Moses and the Tables of the Law, David a harp, Solomon the Temple, John the Baptist the Lamb and Staff, John the Evangelist a book and pen, Peter the keys, and Paul a sword and book. The tracery contains figures of angels with emblems. Messrs. Fouracre and Watson, of Stonehouse, executed the work.

The local board of Teignmouth received, on Tuesday week, sixteen applications for the post of surveyor rendered vacant by the resignation of Mr. Turner. Six of these were considered:—Mr. R. Evans, Chepstow, who asked £200 a year as salary; Mr. W. Poulson, Stoke-on-Trent, £200; Mr. Thomas Blewitt, C.E., Birmingham, £180; Mr. Thomas Caink, Great Malvern, £164; Mr. J. I. R. Dodd, Sheffield, £150; and Mr. R. Valentine, builder, Teignmouth, £100. On the vote being taken, Messrs. Caink and Valentine received an equal number, and the chairman gave a casting vote in favour of Mr. Caink.

The workmen of Mr. George Jamieson, builder, of Woodside, Aberdeen, held a supper and ball in their large workshop last week in celebration of their employers' marriage. At the supper, Mr. Rust, junr., architect, of Aberdeen, occupied the chair.

Mr. Robert King, of Bridge Wharf, Kingsland-road, has taken into partnership his nephew Mr. Walter Scarborough, and the business will henceforth be carried on under the name of King and Scarborough.

The east window of St. Nicholas Church, Saltash, has just been filled with stained-glass, the work of Mr. Gibbs, of Bloomsbury-street, London. It comprises five subjects:—"Behold the Man," "Jesus Bearing the Cross," "It is Finished," "They laid Him in a Sepulchre," and "Touch Me Not."

The *Church Times*, in an obituary notice of the late Rev. G. D. Tinling, of St. Clement's, Bournemouth, second son of Canon Tinling, of Gloucester, mentions that after leaving Oxford, Mr. Tinling spent a year in Sir Gilbert Scott's office, and, at its expiration, took priest's orders.

The foundation-stone of Dalmamock Established Church, at Bridgeton, near Glasgow, was laid on Monday. Messrs. A. Galbraith and Co. are the builders, and the cost will be about £3,500.

A new Independent chapel, to be known as Zoar, is about to be built at Clydach Vale, near Pontypridd. Mr. J. Rees, of Pentre, is the architect.

St. Jude's mission-room, in Lamb-street, Bristol, was opened on Monday. It is built of stone, with free stone dressings, and consists of two floors, on each of which is a room 25ft. by 18ft., and several smaller apartments. Mr. W. Church was the contractor, and the work has been carried out under the superintendence of Mr. Saunders, also of Bristol, at a cost of £600.

The prizes and certificates gained by students in the science and art classes at Cardiff were distributed by Sir E. J. Reed, M.P., on Monday evening. The report stated that there had been, during the past year, an increase both in the number of students and in the prizes and certificates taken.

Mr. William Wilson, late assistant in the Dundee school of art, was presented on the 30th ult., with several books on art, and a gold albert, by the teachers and students, on the occasion of his leaving Dundee to take the post of master of the Kirkcaldy school of art.

A stained-glass window is about to be erected in St. John the Baptist's Chapel, Westminster Abbey, in remembrance of Dr. Livingstone. The principal subject will be a figure of St. John the Baptist preaching in the Wilderness, and in a lower panel will be shown St. Philip baptising the Ethiopian eunuch. The artist is Mr. W. F. Dixon, of the firm of Dixon and Vesey, London.

The parish-church of Dunmow, Essex, has just been lighted with gas; there are three suspended central gaseliers over the nave, and one in the chancel, as well as three lights and brackets in nave, and two open-worked brass standards of 20 lights each, at east end of nave. The work has been carried out by contract by Mr. John Young, of Dunmow.

An infectious diseases hospital is about to be built at Keycol-hill, Sittingbourne, for the improvement commissioners of that town. Mr. W. L. Grant is the architect, and the cost will be £5,000.

The local board of Long Eaton, near Trent Junction, last week adopted plans for the drainage of the district, prepared by Mr. Sheldon, the surveyor, and estimated to cost, in execution, £2,000.

The newly-constructed "light" line of railway from Swindon to Highworth was opened on Tuesday week by a trial trip from Swindon, and a dinner at the terminus, given by the contractor, Mr. James Hinton, to the promoters of the line. There are intermediate stations at Stratton, Stanton, and Hannington. Mr. Robertson was the engineer.

An inquiry was held at Eastbourne on Wednesday week, before Mr. J. T. Harrison, C.E., on behalf of the Local Government Board, into an application from the Eastbourne local board for permission to borrow £3,850 for supplemental works in connection with the disposal of the town sewage. Mr. A. G. Willis, resident engineer to the Duke of Devonshire, explained that it is proposed to adopt the sewage ejectors of Mr. Isaac Shone, of Wrexham, and Lieut-Col. Jones, V.C., declared the plan to have been a success at Wrexham, while Mr. H. Currie, architect to the Duke of Devonshire, and others spoke in favour of the scheme.

The *Salisbury Journal* calls attention to the fact that some shrubs have been planted on the north side of Salisbury Cathedral between the transepts, in order to conceal a gas-engine house which has been erected on the east side of the principal transept, for the purpose of working the bellows. Instead of planting trees, which will hereafter efface the lines of the noble plinth and base moulds which Professor Willis had rendered visible 30 years ago, it is asked whether it would not have been better and more in accord with Gothic precedent to have designed an engine-house in accord with the cathedral, and to have boldly shown it?

A new free library and reading-room, being erected at Luton, by public subscription, is nearly completed. It is of a Free Italian style, built of local bricks and Bath-stone; the facade is enriched with carvings by Mr. S. Horsman. The builders are Messrs. Smart, of Luton, and it is being erected from the design of Messrs. Brown and Humphrey, of the same town.

A Treatise on Horticultural Buildings: their construction, heating, interior, fittings, &c., with remarks on some of the principles involved and their application, by F. A. Fawkes, with 123 illustrations, is about to be published by Mr. B. T. Batsford, 52, High Holborn.

Messrs. Jones and Willis, of Birmingham, have just lit up Coley Church, near Halifax, with their patent Hesperus lamp. The same firm have also executed a handsome oak pulpit and reading-desk and seat for Wolston church, Coventry.

Mr. Coulton Maw has retired from the firm of Messrs. R. Dennett and Co., and the business will in future be continued by Mr. Robert Dennett and Mr. Fredk. Ingle on their own account, under the style of Dennett and Ingle, by whom all debts due to and owing by the firm will be received and paid.

Lamplough's Pyretic Saline is refreshing, most agreeable, and the preventive of FEVERS, BILIOUSNESS, SMALL POX, SKIN DISEASES, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill. *Use no substitute.*—ADVT.

Holloway's Pills have many competitors, though no equals, for supplying the young and delicate with a simple strengthening and purifying aperient. These pills, composed of the finest balsams, are particularly adapted for all complaints peculiar to females, and are most serviceable at the critical periods of early and mature years.

Throat Irritation.—Soreness and dryness, tickling and irritation, inducing cough and affecting the voice. For these symptoms use Epps's Glycerine Jujubes. Glycerine in these agreeable confections, being in proximity to the glands at the moment they are excited by the act of sucking, becomes actively healing. Sold only in boxes, 7½d. and 1s. 1½d., labelled "JAMES EPPS and Co., Homœopathic Chemists, London." A letter received: "Gentlemen,—It may, perhaps, interest you to know that, after an extended trial, I have found your glycerine Jujubes of considerable benefit (with or without medical treatment) in almost all forms of throat disease. They soften and clear the voice. In no case can they do any harm.—Yours faithfully, GORDON HOLMES, L.R.C.P.E., Senior Physician to the Municipal Throat and Ear Infirmary."

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—London Institution. Frederic Harrison on "The French Revolution and the Various Histories of it." 5 p.m.

THURSDAY.—St. Paul's Ecclesiological Society. Dr. J. Wickham Legg on "Liturgical Colours." 7 p.m.

London Institution. Henry Blackburn on "The Art of Popular Illustration." 7 p.m.

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—[ADVT.]

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[ADVT.]

TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender—it adds to the value of the information.

BARCOMBE, NEAR LEWES.—For alterations and additions to Barcombe House, Barcombe, Sussex, for T. J. Elmore, Esq. Mr. George Fuller, architect and surveyor, Lewes and Eastbourne. Quantities supplied:—

Newnham, J. M., Brighton ...	£2,985	0	0
Lockyer, G. R., Brighton	2,940	0	0
Parsons, H., Brighton	2,880	0	0
Barnes, J., Brighton	2,874	0	0
Cheesman and Co., Uckfield ...	2,830	0	0
Card and Son, Lewes	2 737	0	0
Patching and Son, Brighton* ...	2,663	0	0

* Accepted.

BURNTWOOD.—For the erection of new infant-school, with boundary walling, &c. Mr. Samuel Loxton, architect, Bank Chambers, Walsall. Quantities supplied by the architect:—

Widdowson, G....	£840	0	0
Wiley, W.	807	8	0
Blanchard, W.	800	0	0
Insley, G.	796	10	0
Loughton, J.	776	0	0
Brailsford, J.	764	11	0
Callende and Day	760	0	0
Traces, H.	739	0	0
Heap, W. B.	736	0	0
Marshall, G. H	721	0	0
Teece, S. S.	697	0	0
Bennett, W. T....	689	0	0
Wistance, W.	678	11	0
Bedford, A. C.	675	13	6
Barton, R.	675	0	0
Guest, J....	675	0	0
Jones and Son	675	0	0
Moore, D.	658	0	0
Bate, J. H.	650	0	0
Bentley, E.	650	0	0
Lynex, A. (accepted)...	645	10	0

BRIGHTON.—For alterations to two shops in Blatchington-road, West Brighton, for Mr. J. Wells:—

Blaker	£267	7	0
Creswell, H. (accepted)	207	10	6

BRISTOL.—For a new front and alterations to warehouses, Back-street and Welsh Back, Bristol, for Messrs. Davies and Co, Mr. Herbert J. Jones, architect:—

				Allow for old material.		
Sharp and Graham ...	£912	0	0	£60	0	0
Virgo and Ford... ...	898	14	0	18	0	0
Lewis and Edbrooke ...	834	4	0	137	4	0
Eastabrook and Sons	834	0	0	60	0	0
Bastow	829	0	0	25	0	0
Love	760	0	0	34	0	0
Banner	680	0	0	10	0	0
Crocker	675	0	0	—		
Krauss	627	0	0	—		
Johnson (accepted) ...	605	0	0	25	0	0

CARLISLE.—For coffee-tavern, reading-room, shop, &c., Carlisle. Messrs. Hetherington and Oliver, architects:—

Armstrong, C. and J.	£1,105 16 8
Metcalfe, J.	1,039 19 1
Court, W.	1,032 5 1
Bell, J....	1,015 8 0
Court, H. and R.	1,012 0 6
Black, Geo (accepted)	918 16 5

(Architects' estimate, £900.)

CLACTON-ON-SEA.—For the erection of the "Railway Hotel," Clacton-on-Sea, for Mr. F. Snelling. Mr. G. Gard Pye, architect:—

Everett and Son	£5,370 0 0
Beard, J. (accepted)	5,010 0 0
Forshaw, J. H.	4,724 0 0

CLEY-NEXT-THE-SEA.—For a new road from the town to the sea:—

Tubby, C., Brixton (accepted) ...	£135 0 0

COVENTRY.—For the erection of factory at Kingsfield Works, Foleshill, for Messrs. J. and J. Cash. Mr. Herbert W. Chattaway, architect:—

Frith, G., Coventry	£970 0 0
Brown, J., Coventry	964 0 0
Haywood, C., Coventry	895 0 0
Worwood, J., Coventry (accepted)	873 0 0

DEAL.—For laying 9in. piping at North-end, for the town council:—

Chandler, S. and W. (accepted) ...	£55 0 0

EAST DEREHAM.—For the execution of sewerage works, for the local board of East Dereham, Norfolk:—

Hubbard, W., Dereham (accepted)	£2,843 0 0

[Lowest of 14 tenders received, of which the highest was £5,510.]

FULHAM.—For erecting and finishing complete, four shops, dwelling-houses, and stables, on the Greyhound-road, Fulham, S.W. Messrs. Habershon and Fawckner, architects:—

Williams, Croydon	£4,200 0 0
Johnson, Hammersmith	3,990 0 0
Higgs, Loughborough	3,848 0 0
Niblett, Highbury	3,808 0 0
Morton, Kew...	3,800 0 0
Parker, Peckham	3,798 0 0
Shapley, Old Kent-road	3,795 0 0
Brealey, Hammersmith	3,790 0 0
Ward and Lamble, Holloway ...	3,697 0 0
Jones, Gloucester	3,675 0 0
Kearley, Uxbridge	3,667 0 0
Johnson, Wandsworth	3,610 0 0
Childs, Tottenham	3,600 0 0
Judd, Mile End	3,570 0 0
Castle, Redeross	3,569 0 0
Clout, New Southgate	3,487 0 0
Bull and Cooper, Chelsea	3,459 0 0
Beale, Battersea	3,457 0 0
Price and Richardson, Clapham...	3,399 0 0
Battley, Old Kent-road	3,398 0 0
Evans, Peckham	3,175 0 0

GLOUCESTER.—For the erection of the second lunatic asylum for Gloucester, at Barnwell, near Gloucester. Messrs. Giles and Gough, of London, architects. Quantities by Mr. C. H. Goode:—

King, Gloucester	£27,000 0 0
Groome, London	25,800 0 0
Garlick, Birmingham	25,555 0 0
Trevens, Plymouth...	24,350 0 0
Lissaman, Leamington	24,042 0 0
Howell and Sons, Bristol... ...	24,000 0 0
Rigby, Worksop	23,962 0 0
Welsh, Hereford	23,950 0 0
Thomas, Pembroke	23,341 0 0
Vernon and Ewens, Cheltenham	23,229 0 0
Meredith, Gloucester	23,057 0 0
Jones and Co., Gloucester ...	22,950 0 0
Brock and Bruce, Bristol... ...	22,700 0 0
Krauss, Bristol	22,689 0 0
Ashbee and Sons, Gloucester ...	22,500 0 0
Clutterbuck, Gloucester	22,500 0 0
Smith, Birmingham	22,478 0 0
Neill and Son, Manchester ...	22,360 0 0
Davies, Cousins, Cardiff	22,350 0 0
Appleby & Lawton, Milford Haven	22,200 0 0
Lovatt, Wolverhampton	22,137 0 0
Pattinson, S. and W., Sleaford...	21,990 0 0
Drew, Chalford	21,519 0 0
Church, Bristol	21,474 0 0
Forse and Ashley, Bristol ...	20,927 0 0
Veals, Bristol	20,900 0 0
Sharman, London	20,580 0 0

HIGHGATE.—For pulling down and rebuilding a house and shop, No. 143, Highgate-road, Kentish Town, for Mr. W. O'Hara. Mr. James Robert Furniss, architect:—Dixon, 47, Highgate-road, N.W. (accepted) £811 0 0

HORSHAM.—For the erection of a curator's lodge at the new cemetery:—

Skinner, T. (accepted)	£285 0 0

[Lowest tender received.]

ISLINGTON.—For laundry works at the workhouse, for the Islington board of guardians:—

Jacques (accepted)	£225 0 0

LEICESTER.—For the erection of a pair of cottages, for Mr. G. Hartshorne. Mr. Chas. E. Willoughby, architect, 77, Welford-road, Leicester:—

Lowery, P.	£674 0 0
Brown, R. W.	671 10 0
Southam, H. B...	653 0 0
Gilbert and Pipes	651 0 0
Langton and Son	644 0 0
Bass, C.	638 0 0
Knight and Baxter	600 0 0
Bland, H. and Sons	599 10 0
Riddett, J.	593 0 0
Clark and Garrett	593 0 0
Marston, J., Farnham-st. (accepted)	533 0 0

LIVERPOOL.—For lighting, by electricity, twelve of the principal streets in the city during one year, from sunset to sunrise, for the city council:—

Siemens, Bros.	£2,895 0 0
Brush Electric Light Co.	5,800 0 0

[Cost of present lighting by gas, £1,288.]

LONDON.—For making various alterations at the "White Horse," North-street, Fitzroy-square, for Mr. Shannaw. Mr. James Robert Furniss, architect:—

White, 26, Park-street, N.W. (accepted)...	£333 0 0

ROUPELL PARK.—For new road, sewer, &c., on the Roupell Park Estate, for the British Mutual Investment Company (Limited). Messrs. John Giles and Gough, architects. Quantities by Mr. C. H. Goode:—

Carter	£2,137 0 0
Tilbury	2,124 0 0
Killingback	2,046 0 0
Meston...	2,022 0 0
King	1,877 0 0
Parkhouse	1,775 0 0
Mayo	1,711 0 0
Nicholson	1,590 0 0

SOUTHAMPTON.—For the enlargement of St. Mary's Vicarage, Southampton. Mr. A. R. Barker, architect, London:—

Brinton and Bone, Southampton ...	£690 0 0
Bull and Son, Southampton ...	660 0 0
Goodall, Worting	591 4 0

SOUTHAM.—For Southam sewage outfall works, for the Southam rural sanitary authority. Mr. E. Pritchard, engineer, 27, Great George-street, Westminster, S.W., and 37, Waterloo-street, Birmingham. Quantities supplied by engineer:—

Ottaway, F., Oxford	£3,226 14 2
Dovener and Quesnel, Stoke ...	2,115 5 5
Rowson and Co., Stoke	1,719 10 11
Smith, J. W., Westminster ...	1,600 0 0
Smith, G. F., Milverton	1,404 0 0
Watson, G , Southam	1,390 0 9
Currall and Lewis, Birmingham...	1,246 0 0
Dewitt, J., Harbury	1,198 0 0
Green and Son, Warwick	1,177 12 0
Law, Geo., Kidderminster ...	1,139 0 0
Burkett and Co., Birmingham ...	1,045 0 0
Palmer, A., Birmingham (accepted)	979 0 0

(Engineer's estimate, £1,188.)

SOUTHGATE.—For the erection of parochial buildings. Mr. A. R. Barker, architect, London. Quantities by Messrs. J. S. Lee and Son, London:—

Newby, Southgate	£2,782 10 0
Pocock, Wood-green	2,632 10 0
Kerry, Southgate	2,500 0 0
Patman, Enfield	2,461 0 0

SOUTH LAMBETH.—For repairs, painting, &c., at the "Lansdowne Arms," Lansdowne-road, for Mr. D. Bear. Mr. Henry Roberts, architect and surveyor, 3, Sandfield-terrace, Lewisham-road, S.E.:—

Lathey, Bros.	£195 0 0
Lewis, J.	150 0 0
Fisher	149 0 0
Cracknell	138 10 0
Edgley, R. W. (accepted)	113 0 0
For alterations to bar and bar-fittings, &c.:—	
Taylor, J. W.	£303 0 0
Edgley, R. W.	281 0 0
Lewis, J. (accepted)	245 0 0

TORRINGTON, DEVON.—For alterations and additions to No. 2, Moreton Villas. Mr. W. C. Medland, architect:—

Grant, Torrington (accepted) ...	£100 0 0

WARWICK.—For construction of 3¼ miles single line, from Warwick to Leamington, for the Leamington and Warwick Tramway Co. Mr. E. Pritchard, engineer, Westminster and Birmingham:—

Mousley and Lovatt, 1, Westminster Chambers, London, S.W.

WOOLWICH.—For kerbing, channelling, and making-up James-street, Woolwich-common, for the Woolwich district board of works:—

Best, J. W., Plumstead	£597 0 0
Mowlem and Co.	356 0 0
Rutley, Bromley-by-Bow (accepted)	344 0 0

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THE BUILDING NEWS.

LONDON, FRIDAY, JANUARY 14, 1881.

SMOKE ABATEMENT.

LAST Friday a meeting was held at the Mansion House, under the presidency of the Lord Mayor, to take into consideration the question of smoke abatement in London, and the suggestions of remedial measures. The meeting was convened by the National Health and Kyrle Societies, who, it will be remembered, have lately been holding meetings with the object of discussing the question and organising a well-directed effort to abate the evil. The Mansion House meeting not merely ratified the work of the committee, but proved the great public interest felt in the question. Amongst those present we may mention the Right Hon. G. J. Shaw Lefevre, M.P. (First Commissioner of Works), the Earl of Aberdeen, Mr. W. Spottiswoode (President of the Royal Society), the Dean of Westminster, Sir F. Pollock, Sir U. Kay-Shuttleworth, and Dr. Farquharson, M.P. It is unnecessary to say that nothing of a very definite character was proposed, the resolutions that were carried being simply the unanimous testimony of the meeting on the injurious effects of the smoky atmosphere of London on health, and its deteriorating and destructive action upon all perishable fabrics and works of art; and that the smoke in the metropolis might be greatly reduced by the better enforcement of the existing law, and by amended legislation requiring that all premises and dwelling-houses should be fitted with smoke-preventing apparatus and improved stoves. The subject of smoke prevention is not a new question. The Smoke-Nuisance Act—passed in 1853—which applies to London, imposed a penalty of from £2 to £5 upon the owner of every furnace not constructed to consume its own smoke, or which is negligently used; but the statute has not yet been enforced with any satisfactory result, though it was amended in 1858. Many schemes have been proposed for utilising or consuming the smoke of factory furnaces, &c.; among these our readers may remember the proposition only recently reiterated of drawing the smoke of our houses into the sewers, thereby depriving the products of decomposition of their deleterious properties by the deodorising and disinfectant action of the sulphur which the smoke contains, and the more useful idea of economising the waste heat of our smoke flues.

Mr. Ernest Hart, in explaining the object of the society of which he is chairman, dwelt upon the means of prevention. He very justly remarked that by preventing smoke they would not prevent fogs, but that the evils might be considerably diminished, as it is quite certain that smoke adds to the opacity of fog and renders it corrosive and irritating. To the architect, the destructive effect of the smoky fogs of London is a matter of supreme importance, as the action of smoke, and especially the sulphurous acid it contains, is particularly destructive to all limestones used in buildings. The letter read from Mr. F. W. Burton, on behalf of the trustees of the National Gallery, referring to the injury done to the pictures in the collection, and the letter Sir F. Pollock read from Sir F. Leighton, are proofs of another kind of destruction, no less calamitous in its results. The means resorted to to protect the pictures is by covering them with glass, a plan which turns the picture into a mirror, and which spoils the effect of an oil-painting. We have thus actual evidence that a smoky atmosphere is most fatal to works of art, and to all fabrics and decorative processes. The various processes which have been applied to the external stonework of the Houses of Parliament, and to the frescoes within them, are still fresh in our memory. Speaking of the remedies, Mr. Hart said it was desirable that legislation should not be in advance of public opinion or of industrial enterprise, and with this idea in view it is contemplated to have an exhibition in South Kensington in which every kind of smoke-consuming apparatus and smokeless fuel would be shown. A committee of eminent scientific men would test the merits of these various processes and objects. Of the value of holding such an exhibition there can be but one opinion, though the committee entrusted with the collection would do well to classify the different kinds of apparatus. The names of new grates which profess to have this object in view are legion, and a great many nostrums are before the public. It is to be regretted that no very clear or definite views of the principles of constructing domestic grates have yet been put forth so as to lessen the labours of the investigators; and what is more surprising is that, as Mr. Spottiswoode pointed out in proposing the first resolution, so little is known about the nature of fog, and the conditions under which fog and smoke combine. It is somewhat gratifying to hear that the Royal Society have appointed a committee to investigate the facts connected with the formation of fog, consisting of Professor Frankland, Professor Abel, and Dr. Russell; and we hear almost simultaneously of a paper read before the Royal Society of Edinburgh by Mr. John Aitken, which throws a new light on the origin of fogs and dust.

According to Mr. Aitken, dust-particles in the air form the nuclei on which vapour condenses, and that, in short, "if there were no dust there would be no fogs, no clouds, no mists, and probably no rain." His laboratory experiments with moist air at various temperatures may be taken with some reserve as hardly applicable on a larger scale; but if the conclusions he arrives at can be accepted, they will lead to the rejection of all proposals to diminish our town fogs by the means the National Health and Kyrle Societies have in view. The heating of any substance, Mr. Aitken shows, gives off a fume of solid particles which, introduced into a receiver with pure air, produce a dense fog when mixed with steam; but as the principal source of fog-producing particles in our towns is the smoke and sulphur of our coal fires, there is some ground for the hope that by reducing the use of coal fires, and by a more perfect combustion, we may at least enjoy an immunity from the denser forms of fog, and that they may be rendered freer from soot-flakes, and be less injurious to health and our public buildings.

In addition to the mortality produced by smoky fogs, and the corrosive effect of smoke on our stone buildings and art-treasures, pointed out by Mr. Hart, the loss of sunlight in large cities like London is a serious evil, not only entailing the use of artificial light during a large portion of the working day—thus adding to the mist-producing particles—but causing considerable depression to the vital powers, to say nothing of the inconvenience felt by artists and others who require daylight for their work.

There was a general concurrence of opinion that dwelling-houses contribute largely towards the evil. It was stated that five millions of chimneys pour out their contents into the London atmosphere, equivalent to the discharge of thousands of tons of fuel.

Mr. Shaw Lefevre, speaking on the next resolution, dwelt with much force upon the growth of the London fogs. He pointed out that for years past "the air of London had been getting worse, and fogs were denser and of longer duration than formerly, even invading the summer months." Forty or fifty years ago London was famous for its roses; now they would not grow in many parts, and it was almost impossible to get conifers to thrive in the metropolis. Mr. Shaw Lefevre advocated the adoption of some other heat-giving apparatus than that in general use, and he thought the gas companies would do well to turn their attention to the production of gas for heating. For this purpose non-luminous gases might be turned to account.

Turning to the remedies proposed, we are of opinion it would be useless to resort to immediate compulsory legislation, and we agree with the last speaker that persuasion by example would have a stronger effect on the householder. If the householders of London could be induced to use smokeless fuel, such as the anthracite, in lieu of the bituminous, a great point would be gained; but we think that a more economical grate than that employed lies at the very root of the matter, facilities for the adoption of which might be given by the Legislature. Various forms of grate have been introduced of late, a few of which we have lately adverted to. The principle of some of these is that the fire is fed with fuel from the bottom instead of at the top, by which means the gases generated pass through the heated fuel, resulting in a clear bright fire. By a screw action the fuel is introduced in front. The saving effected by this mode of feeding has been computed to be as much as 25 per cent. of the coal, as all the combustible ingredients are consumed. For large factory furnaces, the feeding may be slowly performed by machinery, so that the fuel is delivered in small quantities at a time, and the admission of cold air regulated. Sufficient air for complete combustion, and a disposal of the fuel, so that the vaporised carbon may be in contact with hot air, are the two leading conditions of all smoke-consuming apparatuses; several plans, such as Jukes', have been brought out for the slow admission of fuel by machinery, and it is a fitting opportunity for the display of the ingenuity of scientific men to discover how similar conditions of equable and easy feeding, entire combustion of fuel, and consequent economy in cost, and great reduction in volume of smoke produced, may be secured in the ordinary domestic grate.

What has already been accomplished towards the solution of the difficulty will be exhibited at the forthcoming collection, to be held at South Kensington shortly. Here the joint-committee of the National Health and Kyrle Society have arranged for the display of improved fire-grates, furnaces, kitcheners, cooking, warming, and other apparatus of all kinds devised to prevent smoke or consume smokeless coal. Varieties of bituminous and anthracite coal, and other special fuels will form a part of the exhibition. A guarantee of the thoroughness with which the societies have entered into the movement is attested by the proposal to have a skilled committee of experts to test the efficiency of apparatus, and for ascertaining the relative value of the several kinds of fuel. Manufacturers and inventors have now a favourable opportunity of bringing forward their pet schemes, and we may hope to see many ingenious contrivances in the shape of smokeless grates. We think the last resolution moved by Dr. Carpenter a judicious one, namely, that the results and testing afforded by the exhibition should precede any application for amendment of the existing Smoke Act, or for new legislation in regard to smoke from dwelling houses.

THE GOLDSMITHS' COMPANY'S PRIZE DESIGNS.

THE exhibition of prize and other drawings in competition for the annual prizes offered by the Goldsmiths' Company, now to be seen at the South Kensington Museum, is rather above the average. Evidences of a more correct technical treatment of metal meet us in many of the designs brought together, and it is not less satisfactory to find that the architectural artist, true to the traditions of the universality of his art, has not thought it unworthy of his pencil to contribute designs for goldsmiths' work. Common-sense and logical fitness have too long been divorced from the art of the worker in the precious metals, and those who have sent in designs have only cared to produce lavish specimens of casting or chasing, and to have been prepossessed of the idea that the grouping and ornament used by the carver and sculptor may be applied to candelabra, inkstands, kettles, and other objects in the precious metals. The absence of a motive in design has led the artist to imitate all kinds of puerile fancies, and as cables, the texture of other materials and fabrics, cornucopias, festoons, and especially figures without the slightest meaning or constructive connection.

Figures and figure-grouping seem to possess a wonderful charm in the minds of those who compete for prizes in this competition, and we have on more than one occasion spoken of the taste as something to be striven against, and to be discouraged by those who award the prizes. The evils we have deplored as regards design in the precious metals have arisen mainly from the divorce that has so long existed between the artist and the actual metal-worker, a separation which has tendered to dissever the principles of applied art from the real work, creating a class of workers in metal who, having no knowledge of ornamental art, feebly imitate with meaningless labour every little detail, instead of expressing them in a generalised manner. With this class of designers, the imitation of a festoon, a cornucopia, or a figure is much easier than the mental effort of inventing ornament; we may, for instance, illustrate this remark by referring to the designs for a silver candelabrum, the £40 prize for which has been won by J. W. Bradburn, of Coalbrookdale. It would be unfair to other competitors for this prize to say the distinction won by this award is merited, or that other competitors have not by their designs challenged the justice of the decision. The design by H. Stannus, of Kennington Park-road, for instance, for a candlestick to carry five lights, which wins the £30 prize, is more original in conception, and exhibits technical merits that have been lost sight of in other designs. The design awarded the highest prize is a seven-branched candlestick, of the type usually met with in synagogues, and the author has, in his drawing, alluded to this use, a condition not warranted in the instructions. The design is faulty in scale, the sockets for the candles much too small—a defect which gives a fictitious proportion to the branches. Figures of Moses and Aaron with the Tables of the Law are shown, at the corners of the foot or base, and appear rather wanton introductions. The work is intended to be cast and chased, and the author estimates its value at £200. The drawings are neatly executed, and delicately shaded in India ink. We may remark, in referring to the technical qualities of the designs, that only one competitor, Mr. Stannus, has taken into consideration the importance of constructing the work so as to take to pieces for the purpose of cleaning, a very necessary point in the design. The branches of the candlestick we allude to are formed and cast so as to be easily fixed in sockets on the stem, on the principle of the bracket, and the author has not neglected the value of giving a good fixing to each branch. The design with monogram "W. A. W." has merit; the stem and branches indicate study of requirements, and ornament has not been lavishly bestowed. Two other designs, distinguished by a profuse display of unmeaning and baroque ornament and vulgarity of treatment, are only exhibited, it is hoped, as instances of what to avoid. No plan of the base is given, and in one case the drawing furnishes an ironical comment on the motto. But we pass on to notice the prize design for a dessert stand, by W. H. Singer, of Frome, Somerset, an artist whose work is generally marked by taste. This design which obtains the money prize of £20 has one fault in spite of some good points. The dish has a top-heavy look for the small stem and foot, and the cylindrical portion below the dish in repoussé work, suggests a clumsy effect in execution, while the relief would scarcely be seen in perspective unless the eye were low enough. The ornament introduced in the stem is cast and chased, and there is an elegance in the outline and treatment of the latter which deserves notice, and atones somewhat for the rather ungraceful profile of the upper part. For a silver salt-cellar, a prize of £20 has been given to F. Marriott, of Chelsea, for a rather commonplace design, more pleasing in its general form than the ornamentation. Another sketch for a salt-cellar in silver-gilt, Japanesque in spirit, and simple in outline, with foliage laid on, has the motto "Peeping Tom." J. Holgate, of Chelsea, takes an extra prize of £10 for a salt-cellar, deserving, as it appears to us, of a higher recognition. The base is triangular, and the receptacle is supported on three figures; there is more originality in the conception, and the details are worked out with an architectural feeling, the ornament being cast, stamped, and chased.

The designs for a tea and coffee-service called for the exercise of some skill; the shape and outline of the vessels, and the mode of joining the handles and spouts, so that the latter should appear to be the outgrowth of the vessels, and serve their end in the best manner, having in view the uses of the utensils, rather than become mere apendages, are points to which the thoughtful artist would naturally direct his attention. The design to which the sum of £20 has been awarded is by H. Stannus, and we must confess that the author's work is deserving of it; on the other side of the screen is a design unrewarded, however, which to our mind displays greater merit, and we are led to believe, by the drawing, that it is the work of the same author. In these designs, the principles of stability, ease in pouring, and the junction of the spout with the body of the vessel have been attended to; the base secures the first condition, the upper portion of the pots do not overhang; the handle is placed low down, and springs from the larger part of the body so as to give better control, and the spout is also joined in such a way as to lead out of the body in the most graceful manner, instead of appearing stuck on to it. The ornament has been suggested by the use of each object; thus we find simple chasing or engraving, to symbolise flames, are introduced round the underside of the teapot, the sugar-basin has its bowl reticulated by hexagons, to represent the crystals of sugar. Some of the designs in this class show an inadequate idea of metal relief; the ornament is too highly embossed for easy domestic cleaning, instead of being flatly treated, enabling the metal to be burnished, and utility seems to have been the last of the motives of the artist. We find inattention to the laws of liquid-holding bodies, and of utility in handling, prominent in many of the designs for a silver tea-kettle. The prize of £20 has been awarded to R. Needham, of Heeley, Sheffield. The design has a chased body, with a stand cast and chased; there is some originality in the outline of the kettle, though it exhibits shortcomings in the elements of good design. The spout is awkwardly joined, the handle is not hinged, and the cornucopias and ropes in the stand betray a want of appreciation of the fitness of such ornament. Extra prizes of £10 are awarded to W. H. Singer, of Frome, Somerset; H. Stannus, Kennington Park-road; and F. Gibbon, Cirencester, for designs. The first shows a kettle of rather heavy form, with hammered ornament in the body of Jacobean character, and with a large handle of disproportionate size; the second is better shaped, of Renaissance design; has a hinged-handle for turning down, and the author has wisely pivoted the kettle on the stand, so that it may be tipped forward for pouring; the body also steadily rests at two points on the stand. The kettle is stamped in sections and chased. We need scarcely remark the excessive elaboration in the design of F. Gibbon. Lacking in outline and elegance of design, the author suspends his kettle from two ornamental supports, one on each side of the body, and the manner these are drawn show a very ricketty fixing, and scarcely any lateral strength.

The inkstand designs are poor; we prefer the extra prize design by J. R. Duffield, Birmingham, to the one awarded the £20 by M. Hayes, of Chelsea, which is of an awkward shape, with no place for pens. Exception, also, we take to the hand-mirror by J. Sherlock, a treatment which shows a misconception of the use and mode of handling of a mirror. The drawings for dessert-knife, which take a prize (J. R. Duffield, Birmingham), are not remarkable for any particular merit.

Of the models, the £50 for the best group in plaster, finished for casting, has been deservedly won by Harry Barrett, Mottingham, Kent, for a spirited group, a cavalry officer with flag of regiment. W. Allan, Lambeth, receives a £20 prize for a horse drinking. The other designs exhibited possess more or less merit as groups, but in technical qualities and anatomical accuracy fail. Specimens of flat-chasing, by G. E. Brown, Farringdon-road, and of engraving by W. R. Cooke, Islington, receive prizes. E. Beresford, St. John's-road, receives a prize of £10. If the committee of selection insisted on sections and sketches in perspective, they would be adding considerably to the value of these competitions as tests of design.

WINTER EXHIBITION OF PAINTINGS AT THE ROYAL ACADEMY.—II.

IN the great Central Hall gallery there is an opportunity rarely to be had of comparing masterpieces of our four great artists: Gainsborough, Sir Joshua Reynolds, G. Romney, and Sir David Wilkie, all in perfect condition, even the Wilkie showing no signs of decay. The Nos. are 177, 180, 175, and 176. Sir Joshua's portrait of Lady Elizabeth Herbert and child is unusually rich in colour and happy in composition. She is seated, in a white dress and brown scarf, the child being undraped, looking up into her face and holding her chin in his left hand; there is a telling piece of landscape with trees and blue sky for the background. The owner, Lord Carnarvon, also exhibits another beautiful nude picture of a child, "Cupid Sleeping on a Cloud" (No. 34), equally good in every way. His other Sir Joshua (No. 181) has rather an amusing history. Colonel Acland and Lord Sydney are represented as shooting red deer with bow and arrow—rather a curious process, one would think, for the year 1770. These gentlemen,

who were great friends when the picture was ordered, but fell out before it was finished so that neither of them would pay for it; rather hard upon the artist. Might not the comicality of position have added to the disinclination of either of them to possess the painting? G. Romney's "Mrs. Banks, of Kingston Lacy," No. 175, is as elegant and refined as Sir David Wilkie's "Thomas Erskine, Earl of Kellie," is full of character and vigour. Miss Clara Montalba is to be congratulated upon the possession of the only picture by Velasquez, No. 102, "The Flute-player." The vigorous and bold treatment, doubtless, would delight an artist of her calibre. Of the many portraits by Van Dyck, No. 90, "The Wentworth Family," is of very high quality; the figures are somewhat too evidently arranged to pose, but as a whole, it is a grand picture. Thomas Wentworth himself is very fine. Nothing could be better than the painting of the armour of the gentleman who stands behind the daughter. The finest example, however, No. 137, occupies the post of honour in gallery No. III. It is of the noble dimensions of 117½in. by 106in., and was painted in 1634. The subject is "The Duke of Nassau, his wife, son, and three daughters," whose names and titles are fully inscribed on a pillar to the left. This is much less mannered than the former painting. The colouring is excellent and balance of the parts complete. All is natural, harmonious, and worthy of the stately personages represented. The best single figure is the portrait of Christian, Countess of Devonshire. She is of full length, and dressed in a finely-painted black-satin costume, with pearls round her neck, and having a single ring, the stone of which literally sparkles on her finger. There are several good Italian portraits, one (No. 145) of a Virtuoso, by Parmigiano. The Earl of Strafford's portrait, ascribed to Giorgione, seems to us more like the work of Paris Bordone. Andrea Del Sarto's portrait of himself (No. 150), if, indeed, it is his own, and not that of his friend Conti, is interesting. Giambatista Moroni is well represented in the anonymous portrait, No. 162, with the inscription "Duritiem mollitie frangit." The complexion is singularly dark.

No portraits are of higher value and quality than Rembrandt's "Lady and Gentleman," No. 75. The lady is seated, soberly and handsomely dressed, with a large white ruff; the gentleman, also in black, is standing. It is in the painter's most graceful and finished style. No. 165, "Marshal Turenne on Horseback"—of life size—was painted in 1649 when Turenne was in Holland. There are few paintings by Rembrandt of so important a size. By the same artist we have "Christ and His Disciples in a Storm"—No. 168—very realistic and somewhat vulgar; and No. 161, portrait of a man, of later date and better character. By his pupil, Ferdinand Bol, we have a calm, quiet portrait of a gentleman. Mrs. Hope has no less than three beautiful paintings by Paul Potter—No. 71, a farm-yard scene, called the "Stable-door"; No. 123, a landscape with four cows, a church and houses in the distance; and No. 82, "Landscape, with cattle and sheep." This is remarkable for its fine sky, with scudding clouds, throwing a weird light on the admirably-painted animals and landscape. Of the three De Hooghes, No. 113, from Buckingham Palace, is upon the whole the most important. It represents a card party in a room, lighted by a large window; through the open door a courtyard is visible, and so the artist is able to give his favourite description of varied light. In such natural domestic scenes, accurately and unaffectedly transferred to canvas, he is without a rival. No. 126, an interior, is less powerful, but fuller of detail; and, moreover, it is not in such perfect condition as the Queen's picture. There are few more valuable pictures of the Dutch school than "The Girl with Game and Vegetables," No. 97, by Gerard Dow. It is faultless—every texture is absolutely correct. It is very similar in size, manner, and subject, to that in the Jeel collection in the National Gallery, not quite so pleasing, perhaps, but if anything more highly finished. It is instructive to see how F. Van Mieris arrives at something of the same sort of excellence in a different way. No. 121 is a capital work of this rare painter. An old man stands at a window, round which some ivy climbs; on the left is a violin, and to the right a dish of prawns. Up the stone-work below a snail is crawling, and in the ivy above is a single bright-coloured butterfly; every tool-mark on the stone is drawn. The violin itself is a perfect marvel of realistic painting. No 128 is the best Ostade. "The Village and Church," No. 115, by Jan Van der Heyde, is bright and sunny, and greatly increased in importance by some of the most delightful figures that Adrian Vandevelde ever painted. Except a good J. Crome, and the Gainsboroughs, already noticed, there are not many landscapes of importance. The following are noticeable:—Two by J. M. W. Turner, No. 173, "Kilgarran Castle on the Twyweg," in his early style, being painted in 1799; it is a lovely picture. The other, No. 178, "The Lake at Tabley," was painted ten years later. There are also two companion pictures by Claude Loraine, of good average quality, and some first-rate Venetian views by Canaletto, Nos, 86, 92, and 151; the last, belonging to Mr. H. J. Bischoffsheim, of the "Grand Canal," with the Rialto on the left, is a splendid specimen. No. 46, "Calm on the Medway," is of about the same size and consequence as the companion, painted by Sir A. W. Callcott, which was exhibited last year. It strikes us as better and more natural in colour. We do not much like the "Virgin and Child," No. 152, attributed, without sufficient reason, to Raffaelle. No. 148 seems more worthy of the name. It is a somewhat early work, and has suffered a good deal. No. 149, "The Holy Family," by Titian, is a mere wreck. Not so is "Venus and Mars," by Paolo Veronese. The figures are life-sized, full-length; one cupid is tying them together with a ribbon, while another is keeping back Mars' charger with his sword. There is a good altar-piece, No. 160, by the same artist.

Gallery No. IV. contains specimens of the early Italian, German, and Dutch schools, besides a few very fine early portraits. Mrs. H. Huth's portrait of Sir Thomas More, by Holbein, is of the highest character. He is represented nearly life-size, in a fur-trimmed gown with crimson sleeves, wearing the collar of SS., the size of the panel being 29in. by 23½in. No. 201 is also a fine work of the same master, but a good deal injured by cleaning. No. 210, by Sir Antonio More, represents, in charming fashion, the daughters of Philip II. of Spain. Near to it, and equally interesting, especially for comparison of the costume of the richest, hangs the portrait of Lady Apsley and child. There is not much of the highest class: most are either school pictures or inferior specimens. The portrait by Francesco Francia, of himself, is a notable exception, belonging to Sir W. N. Abdy, who also is the owner of No. 206, a valuable historical picture by Giorgione, of "Malatesta di Rimini and his Mistress receiving the Pope's Legate." The earnestness of the Legate, who is dressed as a pilgrim, the insolence of the despot, and the half-hesitating interest of the woman are well portrayed. All the pictures from the Roscoe collection in the Liverpool Royal Institution are worthy of notice. The "Adoration of the Magi," by L. Van Leyden, and the "Deposition," by Albert Dürer, are both full of interest, both as showing the development of German and Low Country art, and how far these great men excelled rather in engraving. There is none of the archaic stiffness and angularity in the engraved work of either of these artists which mar the beautiful colour and admirable detail of both of these pictures. The other pictures most worthy of notice in this section are No. 184, "Virgin and Child," by Pinturiccio; No. 188, "A Pietà," very remarkably treated, by Andrea Mantegna; No. 203, a fair example of Lucas Cranach, and a very extraordinary Virgin and Child and four Saints, by an unknown artist of the early Venetian school, belonging of Mr. G. Richmond, R.A.

To give more than a sketch of the exhaustive collection of drawings by John Flaxman would exceed the space at our disposal. There are 185 frames, some containing a single drawing, but most of them more, from two or three to nineteen; so that we are enabled to see how this great artist worked and attained the high degree of excellence to which he reached. At either end of the room are some larger and higher finished compositions, one of the best there, No. 85, contributed by Mr. W. E. Gladstone. There are several studies of part of the same subject. It is interesting to notice what pains Flaxman took before he satisfied himself that he had done his best. Of some subjects, we have four or five different versions. How early his talent showed itself is shown in large classical subjects, 1, 2, 3, 140, 141, and 142, said to have been commissions received by him when quite a boy from Mr. Crutch, of Sunning Hill Park. In addition to many hundreds of actual sketches, we have a thoroughly representative exhibition of the finished outlines which he drew for book illustrations. These include subjects from Hesiod, Homer's "Iliad" and "Odyssey." Some very powerful studies from Æschylus. Many of the drawings of scenes from Bunyan's "Pilgrim's Progress," designs for sepulchral monuments. Mr. W. Russell's two drawings from the antique, Nos. 102 and 108, are as highly finished as any by Andrew Mantegna, and they show the great pains taken to secure accuracy of detail. Flaxman was an excellent draughtsman of portraits. There are several admirable examples of his ability in this direction. No. 158 (1) is a capital portrait of himself at the age of 27, dated 1782. But he did a better thing still in 1778 when he was a student at the Royal Academy: we mean the terra-cotta medallion, now belonging to South Kensington Museum. Mo doubt the portrait of Mrs. Matthew, the wife of his patron, the Rev. H. Matthew, who first noticed Flaxman, when a boy, in his father's shop in New-street, Covent Garden, was a labour of love for the kind friend who would read Homer to him while he was making designs.

THE ARCHITECTURAL ASSOCIATION'S EXCURSION IN NORFOLK.

AT the ordinary meeting of the Architectural Association, held on Friday evening, Mr. C. R. Pink, hon. sec. of the excursion sub-committee, read a paper entitled "A Week in Norfolk." The walls were hung with numerous illustrations, including the series of photographs taken during the excursion by Mr. J. L. Robinson, of Dublin, and described in our columns, p. 483, last volume; Cotman's Etchings, lent by Mr. Beloe; sketches, made by Messrs. J. Johnson, W. H. Lynn, F. C. Penrose, W. J. N. Millard, C. H. Löhr, and other working members of the party; and a series of measured drawings of Sall Church, by Mr. T. C. Yates; the last-named of which are reproduced this week amongst our photo-lithographic illustrations. The President, Mr. E. C. Lee, F.R.I.B.A., occupied the chair, and there was a large attendance of members.

The lecturer introduced his subject by pointing out the advantages derived from the Asso-

ciation excursions to those who took part in them, to whom it afforded a valuable means of examining systematically, and of comparing in successive years, the best buildings of different districts of the country in an economic manner, and under able guidance. The tour was devoted to active sketching and note-taking, and the interchange of opinion between members coming from all parts of the kingdom aided in the establishment of *esprit de corps* and good feeling between members of the profession. Having paid a high tribute to the work carried out by the late Mr. Edmund Sharpe, who founded the excursion movement in 1870, he mentioned the districts visited during successive years, and expressed a hope that in 1881 the members would be able to enjoy in one of the western counties a more complete mingling of fine churches and interesting domestic work than it had previously been possible to arrange. In treating upon the immediate subject of his paper, he said he should look at the subject from an architectural rather than from an archæological point of view; and should, moreover, confine himself to the characteristics of the Late Decorated and Perpendicular parish-churches visited, for that reason passing over Norwich Cathedral, and the important examples of domestic work seen at East Barsham and Blickling-halls, and Snoring parsonage. During the 15th and latter half of the 14th centuries, there was a general rebuilding or remodelling of churches throughout East Anglia, principally attributable to the increase of wealth consequent on the establishment of the woollen manufacture in the district; and, in consequence of the diversion of trade, these large and magnificent churches were left with merely rural surroundings, instead of the bustle and business attendant upon manufacturing centres. It was fortunate that the churches had been spared, albeit ofttimes sadly mutilated; and, in almost all cases, the reverse of circumstances had prevented proper maintenance and repair. At Cawston, the fine roof was falling to pieces; the great church of Sall was now almost deserted, and given over to the bats and jackdaws; Trunch Church was also in a miserable state; at Knapton, the richly ornamented roof was decaying; the lofty tower of North Walsham was in ruins; and Deopham Church, so far as its nave roof was concerned, had been pronounced to be in a dangerous condition, and the aisles and chancel were alone used for service. The peculiarities of the Late Churches of East Anglia had been often stated thus: Grand continuous clerestories, rectangular general plan, with nave and aisles, plain square western towers of large size, absence of chancel arch, fine two-storied porches and also vestries, splendid open-timber roofs, together with other rich woodwork in tower-screens and galleries, rood-screens, stalls, benches, &c.; large stone fonts, often with rich covers, peculiarly beautiful decorative painting made on woodwork, and a profusion of surface decoration in flush flint-and-stone panel work outside. These were the characteristics of the general type, but there was great variety in its particular application, and few or none of the churches comprised all the peculiar details described. Largeness of treatment and simplicity, and grandeur in proportional lines, distinguished this late work generally. The details were also as a rule unusual and worthy of careful study, whilst the woodwork, whether constructive as in roofs, or decorative as in screens and stalls, had been brought almost uniformly throughout the district to a degree of richness and excellence unequalled in any other part of England. The lecturer proceeded to describe in detail some of the more interesting ground-plans. That of North Walsham was a simple parallelogram, the only projections being the porch and tower. The aisles were continuous throughout, and there was no chancel, and the screen forming the only division; the eastern bays of arcades were, however, solid to form the sanctuary. The plan of St. Peter Mancroft, Norwich, differed from the last in having north and south porches, a projecting sanctuary, with vestibules behind, and also very small (11ft. by 9ft.), and subordinate transepts. The internal dimensions (excluding sanctuary, which was 14ft. 6in. deep) were 100ft. by 51ft., the width of nave was 19ft., and of aisles 13ft. 6in. The arcades were of eight bays, but the several arches had various spans. The staircase turrets flanking the east end of sanctuary were somewhat unusual. St. Stephen's, Norwich, was a parallelogram, with the tower on north side over the porch, and on the same side was a small projecting chapel. The dimensions inside were 130ft. by about 50ft.; but the north aisle got narrower towards the east end, and the nave was not of uniform width. Sall Church (see photo-lithograph) possessed a more fully-developed and elaborate plan than those previously considered. The nave was 90ft. by 27ft. 6in., with aisles each 14ft. wide; western tower; north and south porches, of large size, and fully-developed transepts; the chancel was treated distinctly, and was 59ft. by 26ft. Cawston had a nave 90ft., by 54ft.; chancel, 46ft. by 25ft., with north aisles and small attached chapel, west tower, south porch, and transepts of considerable size. Hingham consisted of nave, with aisles, west tower, south porch, and chancel, with a two-storied vestry on north side. Worstead was similarly planned; but the chancel had a short south aisle, and on north side a chapel, as well as vestry. Knapton and Edingthorpe were buildings of less size, and aisle-less; but had west towers and south porches. A comparison of plans showed a general ratio between lengths and breadths, the width of aisles being often half that of nave; the total length of church double the width. At Sall the breadth of body of church was about two-thirds the length, and equal to the length of chancel; the breadth of aisles and transepts was about the same and equal to half the width of nave. At Norwich Cathedral and Hingham parish-church the level of nave-floor descended towards the east, while at East Dereham there was a more noticeable ascent to the chancel. At Knapton the chancel-floor was stepped down below that of the nave. The church towers were commonly of large size, and considerable altitude; their general plan was square, and their position was almost always at the west end. They sometimes simply abutted on the west wall of the church, as at Sall, and St. Giles's, Norwich; but in other instances, as at Trunch, the aisles extended partly along the side of the towers. The general staging of the towers was simple; there was the ordinary number of principal stages—the lowest opening into the church with a well-developed arch, and having on the opposite face a fine west window and doorway, frequently so intimately connected in design as to form one feature. At St. Giles's the span of the tower arch was the whole interior width of tower, and the depth of moulded splay to jambs was striking. Sall and Cawston afforded good instances of the combined treatment of west doors and windows. The sill of the west window rested upon a richly-panelled band of stonework adorned with shields, and the spandrels formed between this and the well proportioned and richly moulded recessed doorway were filled with vigorous carving. A canopied niche flanked the doorway on either side between it and the buttresses, and base courses were also elaborately worked with traceried panel-work. At Worstead the outer mouldings of window-jambs were continued to the ground. At Cawston the attacking hunter was represented in one spandrel under the square hood of door, and his foe, the dragon, in the other; the same subject appeared similarly placed upon St. Ethelbert's gate at Norwich. In the stage below the belfry occurred the misnamed "sound-holes," which were square traceried windows, appearing generally upon each cardinal face. The tracery exhibited the greatest variety in design, and Sall and Worstead were particularly good examples. Sometimes, as at St. Lawrence, Norwich, and at Westwick, the design was similar to that often repeated in base and string-courses—the escutcheon surrounded by trefoils or quatrefoils. Two plain buttresses to each angle of tower were the rule, and the sets-off were few in number. At Deopham, Hingham, and St. Peter Mancroft, the angles made with the tower were canted off; and at Wymondham the buttresses were semi-octagonal on plan, and had small angle-shafts. There was an absence, almost universally felt, of that gradual diminution of bulk and change of plan which gave such a charm to the tower buttressing in Somerset. Trunch and St. Giles's, Norwich, offered the most striking examples of violence and coarseness in the sets-off; but there was a general want in the Norfolk designs of any leading up to pinnacle and parapet as the crowning features. The tendency was to stop the buttress below the belfry, and if continued above this it was often, as at Sall and East Dereham, in the form of a pilaster. The parapets were generally plain, but even the enriched battlements and angle pinnacles of the altogether fine tower at Sall seemed to want character, and the whole design suffered from a lack of cohesion when compared with, say, Bruton or Evercreech. There was also but little variety or piquancy in the skyline of towers, and the staircase turret was rarely a prominent feature, and spires were still more rare, the only examples seen during the excursion being those of Norwich Cathedral and Great Ellingham and New Walsingham Churches. He had obtained some dimensions of the principal towers, and found that Wymondham was 142ft. high, Hingham and Cawston both 120ft., and St. Peter Mancroft about 100ft. Sall measured externally 27ft. by 27ft., Worstead 28ft. by 28ft., and Hingham 33ft. by 33ft. Cawston tower was remarkable in this district from the fact that it was ashlar-faced with stone throughout. He would not go at length into the question of the round towers, of which they only saw unimportant examples. There were nearly 200 round towers in East Anglia, all of similar size and proportions, built with thick walls and without external doorways. Their dates, however, varied, as also the character and amount of decoration. Some, as at Edingthorpe, which was visited during the excursion, had the circular worked into the octagonal plan. He could not agree with the theory that the round form was adopted in a district without stone to avoid the use of quoins, for that material was used pretty freely in other portions of the churches, and he thought instances, even, of quoins worked with flints alone could be pointed out. The Rev. T. James had further held that the lack of stone led to the adoption of aisleless churches, and the omission of spires; but the former omission was the exception, not the rule, and a lack of stone could not be urged as a reason for the rarity of spires in the in every respect parallel district of Somerset. The way in which flint was used in conjunction with stone appeared to the author to show not so much a desire to save the latter, but rather a wish to obtain original effects by the use of local materials. In describing this flint panel-work, Mr. Pink remarked that flints were commonly used for ordinary walling in a rough state, as in Hampshire and other chalk districts, laid either random or in courses, projecting portions being roughly headed. They next found the flints uniformly split to give a fairly smooth face, and then squared, forming, when laid, diminutive ashlar-work. The simplest mode of using the dressed flints in conjunction with stone was seen in the plain checquer-work, as at Norwich Guildhall; but in more elaborate work there were panels, arcading, tracery, &c., of stone, filled up with split flints, carefully cut to fit into cusps, circles, and other geometrical outlines. The effect of this kind of work at a distance was to bring the stonework into relief as if by strong shadow; but where extensively used the appearance was cold and mechanical, and time had little influence in softening the outlines or surfaces of the hard, almost polished, flint panels. In some cases, moulded stone-work was used as a framework, projecting in front of the usual filling-in, as at Fakenham. At North Walsham, greater effect was gained in some canopies of the porch by an inlay of brown stone. It was by no means unusual to see in Norfolk bricks used in conjunction with flint. The porches throughout East Anglia had the greatest care and elaboration bestowed upon their design, and their large size and considerable altitude (generally of two stories) gave them almost a transeptal effect. The entrance was almost uniformly under a well-proportioned and richly-moulded pointed arch. The spandrels formed by the arch were often, as at Wymondham, Sall, North Walsham, and Attleborough, filled out to form a square head with shields, carved figures, or flint panel-work. Above the doorway the division between the stories was strongly marked in most examples by a rich band of sunk panels and shields, or ornamental flint-work. The "parvise" was generally lighted from the front by a square or segmental-headed window of considerable size, and often flanked, and sometimes surmounted by rich niches, and the front was completed by a low pedimental gable, or now and then by a horizontal line and rich battlements. Necessarily, however, there was great variety in the details of the several examples, but a comparison of the photographs and drawings would, he

thought, enforce the conclusion that the modern porch to St. Andrew's Hall, Norwich, scarcely exhibited the character and feeling found in old instances. Another external feature worthy of notice was the plinth, which was usually of excellent design, and much enriched with flint-panel-work. The abruptness of projection was very remarkable. The window tracery evinced great variety in design, the most noticeable peculiarity being the prevalence of a Flamboyant character in the Late Decorated work, and even in the Perpendicular tracery a greater use of flowing lines than usual. The principal window heads were contained under well-developed pointed arches, but in clerestories there were frequently adopted flat, four-centered arches, almost segmental in effect. Parapets were chiefly used for aisles, as the massive framing of the roofs required the use of the whole top surface of walls. In the internal arcades the distinguishing features were loftiness and excellence of proportion; the mouldings were large and effective; the rounds were capped at the springings, the hollows being continuous; and where there was no chancel arch the arcades were sometimes differentiated where they bounded the choir. An arcading was sometimes, as at St. Andrew's church, Norwich, employed on the aisle walls, a plan which, besides giving variety to the wall surface, was also useful in strengthening comparatively thin walls. Of the typical East Anglian clerestories, which almost resembled glazed gratings, so large was the window-space, so small the divisions. The Norwich churches, especially St. Peter Mancroft, afforded the best examples, and these, with their grand and massive roofs supported upon the much-pierced clerestory walls were, from the absence of tie-beams and buttresses, little short of marvellous, even to the architect. Of the Norfolk roofs there were several varieties, such as the low-pitched, with straight or cambered tie-beam or four-centred arch; the curved rib and hammer-beam (the latter sometimes concealed by a continuous cornice or cove); and the double-beam roof. In almost all examples might be noticed the springing of principals from corbels well down on the walls, curved braces forming wall arches, rich and effective cornices, and the curving down of the ridge-piece to meet the principal rafters. All, or almost all, the finest roofs had a pitch somewhat less than 45°. Having described in detail the typical church-roofs at Great Ellingham, Worstead, Cawston, Trunch, Wymondham, Knapton, Sall, and St. Peter Mancroft, Mr. Pink said that at North Walsham was altogether different from the others; but was very suggestive in treatment. The church was exceptional in the district in having no clerestory; it seemed probable that it was intended to add this feature, and that the present massive, but severely-plain, roof was provided as a temporary covering. The nave and aisles were practically under one roof. The aisles had lean-to rafters and tie-beams, and from the latter the purlins were strutted. The tie-beams went through the arcade walls, forming the corbels to the wall-posts, and curved struts which rose to the main tie-beams of the nave span, the latter beams being placed at the level of tops of aisle-rafters. Upon the nave tie-beams, at the points supported by the struts below, were placed queen-posts, forming struts to purlins, and these posts were again braced by curved ribs, which met and formed an arch under the apex of nave-roof. As examples of boarded and panelled roofs, Wymondham north aisle, Dereham transept aisles, and New Walsingham aisles might be mentioned. The Wymondham roof was a very rare instance of hammer-beam principals being used in an aisle. Throughout the subsidiary features of these churches—including the screens, stalls, benches, font-covers and doors—were to be found a wonderful variety, freedom and delicacy of design. The painting upon the lower panels of screens was of an exceedingly fine character, and suggested that it was the work of foreign artists. The figures were often admirable, and the diapered and floriated backgrounds would repay the closest study. Attention might be called to the buttressing of the stall-ends at Trunch, and to the spire-like font-covers at Sall, Worstead, and North Walsingham, in which by comparatively simple means an elaborate effect was produced. The font-cover at Trunch was almost or quite unique; its date was 1502. The effect, even in its present state, was rich in the extreme, and traces of colour decoration remained; and the cornices of the niches, curved on plan, were also, to increase their effect, curved upwards in elevation. The fonts themselves were throughout Norfolk of large size and of most elaborate character. The plan was almost universally octagonal, and the font was raised upon steps. The risers were generally enriched with panels, having sunk quatrefoils and other figures. From the moulded base of the font proper often rose small angle shafts, with perhaps carved figures at their bases, the sides of shafts being panelled or enriched with niches for figures. Angels generally supported the bowl, on the faces of which were carved the Crucifixion and Seven Sacraments, or the Evangelistic emblems, angels, armorial bearings, &c. Of these fonts the finest seen was at New Walsingham. In conclusion, Mr. Pink offered, as an excuse for any superficiality in his remarks, that the fact of his holding the office of excursion secretary scarcely conduced to his giving such careful attention and study to the buildings visited as they deserved, and as he would have wished to have devoted to them.

The PRESIDENT, in inviting discussion, expressed surprise that Mr. Pink, who appeared to exert himself to the utmost in arranging the excursion proceedings during the week in Norfolk, could have found time for observation requisite to write so analytical and detailed an examination of the churches visited.

Mr. JAMES FOWLER, Mayor of Louth, said he was glad to see the room so well filled that evening, for he considered that every member ought to aim at joining excursions of the class described by Mr. Pink. In such tours they learned much that could not be gathered from the most diligent study of books, including the effects of combinatious of colour and of light and shade on details in position. Books on architecture were to the study of actual buildings, but as a surgeon's preparation of bones and muscles were to the actual living form. The association excursions gave the stimulus of company in observation, comparison, and in preparing sketches, were productive of good fellowship, and were carried on in a more economical fashion than could be arranged by individuals. He begged to propose a vote of thanks to Mr. Pink for his exhaustive paper.

Mr. CLARKSON referred to the two principal examples of domestic work seen during the week in Norfolk, the halls at East Barsham and Blickling. Although he knew the latter building well from Shaw's book, he was not prepared for the refinement of the details, and the skilful arrangement of parts it exhibited, and in seeing it for the first time, one realised the force of the remarks of the last speaker, as to the difference between the study of illustrations, and of actual buildings. He noticed that the front of Blickling was very much pierced, and that the designer had placed at either end a shallow tower with but few openings in it, apparently for the purpose of restoring the balance between solids and voids in the façade. At East Barsham they observed that a good deal of terra-cotta was introduced for medallions and other ornamental details in the brickwork. Certainly the most impressive of the churches seen during the week was that of St. Peter Mancroft, Norwich, which possessed great dignity of design, and all the details were applied in a wonderful way, so as to aid in bringing out the architect's conception. Its shallow transepts, and two-storied vestries seemed to have been thrown out in order to add buttressing buildings to the lofty structure, and probably the small transepts and two-storied porches at Sall and other churches had a similar purpose.

Mr. MAURICE B. ADAMS thought one thing must have been evident from the proceedings of that evening to those who did not take part in the excursion, that those who went were, on their own showing, an exceedingly jovial set of people. Certainly all the excursionists worked heartily, and amongst the hardest workers were Mr. Pink and Mr. Robinson, who took the photographs. He would ask, however, what were the practical lessons to be learned from what they saw and sketched? The first was the immense distance by which we were separated from those who built these churches. They saw everything down to the least detail carried out with a thorough regard to scale, and everybody employed seemed to be in harmony with the work that was to be done. Nowadays they knew the mason thwarted the carpenter, and that the carpenter seemed to be at variance with the plumber, and that as for carving it was evident that very few men were to be found able to undertake it. Looking to the falling off in religious feeling in England, he feared it would become increasingly difficult in the future to build churches, or rather to raise money for them, and, therefore, he thought the late Norfolk work was not a style to be widely copied, for unless done thoroughly well and harmoniously, the result would be meagre and bad, as they saw in most of the Norwich churches. In the domestic works they might have seen a hint as to the proper use of terra-cotta worthy of adoption. Modern terra-cotta was too prominent, too hard, too metallic, too like cast iron. At East Barsham Hall the examples, on the contrary, had to be carefully looked for to be distinguished from the brickwork, even where the material was most freely used, and this quiet effect seemed due to the fact that it was always framed in panels, or within strings of moulded brick, and never built in simply as quoins, like stone would be. Some of the roofs in the churches visited were in a dreadful state of disrepair. At Knapton, a congregation could not use the church in wet weather, and at Deopham they had to rush across the nave and occupy only the aisles and chancel, as the magnificent nave roof is likely to fall in at any moment; but he must admit that the parson at Deopham showed a commendable anxiety that the members should subscribe towards the restoration of his church. He thought it strange that while the Institute and certain prominent members of the profession were making themselves very conspicuous in reference to St. Mark's, Venice, they ignored our fine village churches close at hand, which, like that at Knapton, were simply going to rot. What did the Institute and the people who wrote to *The Times* about St. Mark's, practically do for the preservation of our own churches? Comparatively nothing, for there was no glory in it. The S.P.A.B. would do infinitely better service to the cause of architecture if, in lieu of agitating about the pulling down of trumpery galleried inns, they would look at the way in which St. Alban's Abbey was being spoiled. Some of the cases they became acquainted with, as Deopham, Cawston, and Sall, seemed utterly hopeless, and he thought it would be more befitting if the parsons, instead of writing testimonials to cheap sherries, would do something towards keeping the rain out of their churches.

Mr. JOHN JOHNSON referred to the excellence of the domestic work at Blickling, and commended as worthy of study, the charming arabesques introduced into it. It was a remarkable thing that the designers of the large churches in Norfolk seemed to have neglected the upper portions of the structures; the plan and general design and fittings appeared to have been carefully thought over, but the upper stages of towers were poor and crude. He was struck by the skill with which the church-roofs were connected with the clerestory walls, being, indeed, thoroughly built into them. This, perhaps, accounted for the fact that they saw heavy hammer-beam roofs, of wide span, carried without a tie-beam or other cross support. In the case of St. Peter Mancroft, Norwich, one of those without a tie, it appeared wonderful how the roof had continued to stand.

The vote of thanks having been warmly accorded, Mr. Pink replied, and proposed a vote of thanks to Mr. Robinson for having given for the library an album of photographs taken during the excursion.

THE STUDY OF THE BEAUTIFUL.*

WITH regard to the law of fitness, we must be careful to consider whether beauty consists in fitness only. In nature it certainly grows out of it, but in the works of man you can find millions of examples of very useful articles being very ugly, as for instance, the chimney-pot hat, the hot-water-can, the lamp-post, the ordinary square London-street house, &c., and even this kitchen jug, which, though not offensively ugly, cannot be compared to this Greek vase for beauty of form, since it possesses none of those ornamental qualities which we have noticed in the vase. But if things were called Beautiful, only

* A paper read by GEORGE ADOLPHUS STOREY, A.R.A., at the London Institution, Finsbury-circus, Dec. 30th, 1880. (Concluded from p. 6 in last issue.)

because they were exactly adapted to their uses, then this jug is quite as beautiful as this Greek vase, because, when I borrowed it of the cook, and called it ugly, she said "It may be, sir, but its very useful," I pointed to another that seemed to me equally useful and much prettier, "Yes" she said "it may be prettier, but I don't like it so well as the other; and why, because I can't get my hand inside it to wipe it out, and I can in this one." So we must not abuse this jug for not being beautiful for it never pretended to be that, it is quite honest. It means to be useful; and if it were much better it would perhaps be worse, for it would have to be taken more care of and not left in the kitchen to be useful, but very likely would have to be put away in a cupboard. It possesses at least two great virtues, usefulness and humility. It does not say: "Look at me and notice how quaint and curious and rare and uncommon I am for a kitchen jug;" but it says, "Use me, keep me clean and don't drop me, because if you do, I shall only be fit to be thrown on the rubbish heap." Here is another work of art quite different to the Greek vase, yet full of the most precious work, and is like Greek art in this respect that it is founded on the most careful study of nature, and possesses in the details of its ornamentation, which consist of birds, fishes, and plant forms, all that expression in the outline and that exquisite finish which distinguish good art from bad, and are the characteristics of nature's own drawing. We cannot enter into the subject of Japanese art now, but I call your attention to this cabinet only as another proof that art must be studied from nature. The Japanese never had Apollo's nor Venuses nor sculptures from the Parthenon, nor Raphael's nor Michael Angelo's works to study from, and yet there is no denying that they are great artists, possessing a wonderful sense of colour, consummate taste, a love for nature, a great sense of humour, and a remarkable power of delineating human character, and also the character of every other object that they choose to represent, or to fashion into ornaments or articles of daily use.

To leave out any mention of colour in speaking of the Beautiful, would be to leave out one of its most delightful elements, and yet we can scarcely do more than allude to it. Sir David Wilkie writes:—"After seeing all the fine pictures in France, Italy, and Germany, one must come to the conclusion, that if colour is not the first, it is at least an essential quality in painting. No master has yet maintained his ground beyond his own time without it." Colour possesses the same quality of infinity that we have noticed of form, and a composition of colour must have the same qualities of unity, of repetition, of gradation, of breadth, of proportion, of consistency, of contrast, of variety, of interchange, that a composition of lines or masses must have. But the colours of things, like the forms of things, must be studied from nature; it is only the continual intercourse with nature, that can give the true power of colouring. Here are water-colour sketches, made for the most part out of doors, (though perhaps nothing to boast of) which exemplify this. I know I could not get colour as good as is even shown here, unless I had taken it straight from nature—not that I have ever yet been satisfied with any sketch that I did, at all events, at the time it was done, and when the perfect nature was still before me. Excuse me for speaking about myself; but there is something so subtle, so intricate in this subject of colour, that I know not how to speak of it by any other means, than by mentioning my own sensations about it. Colour seems to me to reflect our emotions almost more than anything else. A bright sunny day rejoices us with its sparkle, its mirth and colour; is all astir with strong lights and strong shades; all seems merry, and the air is full of music, what with the birds singing, and the children laughing among the flowers. Then there is the golden-grey day; the sun is slightly veiled, and the tones of nature are rich, and deep, and mellow, like the tones of a church organ: this gives us a deeper and a calmer sense of joy. Then there is the drisly, foggy, dreary, dark day, when there is no colour anywhere; when the air is charged with the smoke and dirt of chimneys, and that is dreadful. But there is also in evening another scale of colour; a gradual change from the rich gold and crimson of sunset, to the cool and silvery tones of departing day, when the trees grow dark against the sky, and a refinement of strange mystery envelopes all around; every colour seems to assimilate itself more and more to the other and the bright flowers are no longer seen. And then comes night, the reign of paleness and darkness, a symphony in faint gold, faint blue, purple, and warm black, with gleams of sombre green, and bright touches of silver; these are the restful—the sad colours. I can quite understand an artist in his great enjoyment of the effects of colour as nature shows them to us in these different scales being tempted to make colour the one and only aim of his art, but the great colourists have been men whose sense of proportion taught them that art was not colour only, nor form only; but the combination of all the elements and characteristics of nature. For how can that art be said to be founded upon nature, which would represent her, or rather misrepresent her as a shapeless assemblage of tints, and tones—however beautiful they may be in themselves? We might almost class our painters under these different headings. The "Sunny day Painters." First and foremost of these, is Paul Veronese, whose brilliant and pure colours are enhanced to the utmost, by gentle contrast, and where necessary by positive contrast and so harmonised, that, in his enormous and fearless compositions, they make one magnificent chord of silvery sunny day colour. Note as examples the Feast in the House of Levi, in the Academy at Venice; the Marriage at Cana, in the Louvre; the Family of Darius at the feet of Alexander, and the Consecration of St. Nicholas in our own National Gallery in London (although unfortunately these pictures have lately from some cause, not explained, turned dark, and have lost much of the brilliancy that they possessed when these sketches of them were made). Then comes Bonifaccio with his "Rich man at table," in the Venetian Academy; Benozzo Gozzoli, and Rubens the magnificent, nor must we leave out the modern pre-Raphaelites, and many of our water-colour painters, nor our landscape painter Turner, whose works come under all the headings that we have mentioned—he is one of the exceptional men. Nor need I say, that there are many living now, whose names I cannot mention, who are essentially sunny day and glad colourists. "The golden grey day." First and foremost in this school of deep toned harmony, comes the great Titian, and then Giorgione, and I know not how many others. Cuyp and De Hooghe, and other Dutch and Flemish masters, show us the beauty of this veiled sunshine. To give a list of all the painters who come under these different headings, would be impossible now, we can only give the first examples that occur to us. But the painters who delight in the tranquil shades of evening are many. Cousens and Girtin, and also Turner are beautiful examples.

I most regretfully leave this subject of colour; to study it perfectly in all its bearings would lead us into a science as deep and almost as perfect as geometry, though more difficult to demonstrate; and we might have problems in colour, as in geometry, such as "Given—a rose whose petals graduate from creamy pink to deep crimson, what proportion of other colours is necessary to give that rose its utmost value—or Given a bunch of red poppies, what proportion of other colours is necessary to make them quiet themselves down or to make them sing out still louder? Or, Given deep ultramarine, and scarlet, and purple, and green, and gold, and silver, in what proportion shall we distribute them, and in what manner shall we vary them, or reflect them into each other, so as to produce the richest chord of colour? Beautiful colours are like so many sweet spirits all trying to make each other as happy as possible; now standing side by side, in almost imperceptible gradations to help to the beauty of the group; now sacrificing themselves and putting themselves in the shade, in order that some bright sister may look still more beautiful and precious. One would think that there was a deep philosophy in colours, which taught us to think more of others than ourselves, for in thus behaving towards each other, they show forth their own degrees of perfection and beauty, be it the quality of retiring humility consenting to hold the second rank, or of supremacy obliged to hold the first, or of power of richness, or of tenderness, each and all possessing beauty and lovableness, and agreeing with each other for ever, without satiety, without monotony. Methinks it would be pleasant to live in a paradise of that sort. But imagine now an assemblage of just the opposite kind, where each colour is jealous of the other, and keeps coming forward and saying, here look at me, don't look at any body else, like the star actor who thinks he will appear so much greater if he surrounds himself with "poor sticks," as they are called, and then fancy them fighting amongst themselves, and looking black and jealous at each other, and all making each other appear even more ugly than they really are, and all governed by jealousy and selfishness instead of humility and love, and then you have just the opposite of the Paradise of the good colours in the limbo of the bad ones.

One word about the manipulation of painting, the quality of handling. What we call fine painting is such as that of Velasquez, or Vandyke, or Veronese, or any other master who knows what he has to do, and does it at once fearlessly and yet feelingly. It is not a quality to be learnt or to be sought, for it comes of its own accord. Every characteristic of a painter's mind is exhibited in his touch. It is his hand-writing, and although it is of the greatest importance for the artist and the connoisseur to know this, as by it the painter of a work is recognised, there is not time now to do any more than call attention to this very subtle and curious feature in the art of painting. But how little are we advanced in the study of the Beautiful, and how much more is there to be considered! We have as yet spoken only of outlines of forms, and of colours and their combinations. But now let us imagine a beautiful countenance—the looking-glass of the mind. It may be kind or full of disdain, it may be passive, or laughing, or frowning, doubtful, sorrowful, anxious, suplicating, full of pity, and, indeed, possessed of every variety of expression, all of which it is part of the mission of art to depict, and to go further still, and to depict the reasons for it—to tell a story, or a history, or represent a drama. False sentiment is never found in good art. The subject of a picture may be revolting and terrible, and yet it may be a grand work if it is true in sentiment. But the most lofty and most poetical subject may be easily spoilt by unnatural attitudes and affected expression. It is the "touch of nature makes the whole world kin," and he who would depict the actions of men, the passions of men, and even their thoughts, in their faces, must himself be human; he may be as divine, or as poetical as he likes besides, but he must first be human, so that he may sympathise with and enter into all the feelings of joy or sorrow of his fellow creatures. To exemplify this would, be impossible this evening, but I may refer you to Mr. C. R. Leslie's book which he calls "A Handbook for Young Painters." In that book you will not only find pointed out in the most clear and unaffected way how great subjects, and also little subjects, have been treated by great masters, but you will also see there how learned, how just, and how interesting is the art of sound criticism.

Let us next deal with the Study of Nature. All schools of art, and all artists individually, are excellent in proportion as their works are founded on the study of nature. And the real academy of art is in the green fields, among the wild flowers, in the woods and on the rivers, in the sea and in the sky, and in all the living things that inhabit them, and among the mountains in all their grandeur. And then, again, in the streets of towns, at home or abroad, where every day we may see something, whether an incident, an attitude, or a group, that will furnish us with material for our art. And so, again, in the homesteads, in the playground, on the battle-field, in human action, in joy and sorrow, and in the human heart. And if our students study earnestly and lovingly in this academy of nature, and there are many I know who do, then I can see no reason why modern art, and art in this country, should not be capable of equalling, I will not say of surpassing, the art of the ancients. I say I see no reason why it should not be capable, I do not say that it does, or that it will, but still the road is open to us. Surely nature is as lovely now as ever she was. We have, I think, as kindly feelings now as ever man had; and I will venture to say, that women are as beautiful, children as sweet, and men as handsome as ever they were. Why, then, should not art be as fine now as in the old days? Here are toy-books by modern artists that are as fine of their kind as anything that was ever produced. *The Mad Dog*, *The Three Jovial Huntsmen*, *Sing a Song for Sixpence*, by Mr. Caldecot, are full of fun, of

action, and of real humour, and are founded, every stroke of them, on nature. The drawing is exquisite, whether it be of the figures, the landscape, the horses, the birds, or the dogs and other animals; and every composition in them, however slight, is in conformity with the laws of art. These books cost but a shilling each, yet may be of countless value to the country, if we calculate the amount of delight and improvement in taste that they may impart to the rising generation. Think of the toy-books that were supposed to delight many of us when we were children, with their smudges of gamboge, sap green, Prussian blue, and staring crimson lake, and then let us be thankful to Mr. Caldecot and to Miss Kate Greenaway, with her many books, especially *Under the Window*; not forgetting Mr. Walter Crane and Mr. Henry Stacey Marks, who was, I believe, the founder of this delightful and important branch of art. When I am told that there is nothing new under the sun, these pleasant books make me almost doubt that assertion. Nature is older than the hills, and yet she is ever new; and these books prove to me that there is no end to the new ways of representing her. Our modern pre-Raphaelites—wrongly so called, or jokingly so called—when they first appeared, interested everybody with their works; they were a great feature at the Academy Exhibitions some twenty years ago. And why? because they were founded on the study of nature, not of art; were most laborious, most earnest, and full of affection for nature; they were totally unlike any other art that we had seen before; and if they in some instances appeared to us quaint, their quaintness was the result of the earnestness of the painters, and not of affectation. But when artists begin to copy from each other, and to copy from art instead of nature, then degeneration takes place. I particularly say instead of from nature; we must, of course, make every possible use we can of the art which has preceded us, and learn our lessons from it, and take delight in it, decorate our walls with good reproductions of it. We cannot always prevent ourselves from imitating, to a certain extent, those works that we most admire, but we must stamp our imitation with so much individuality that it becomes a new and original production, though suggested by the work of another. A great artist like Raphael draws straight from nature both for his inspirations and for the details of his pictures, and hence his work always reminds us of nature, accompanied with the grace and loveliness of Raphael's mind; but the followers of the master, such as certain German imitators, do not recall nature; it is true they remind us of Raphael, but they remind us that he is dead. In the exhibitions of the Royal Academy, the Dudley Gallery, and the Grosvenor Gallery, we must see that our artists are now, perhaps more than ever, inclined to go to nature direct, and to bring back for themselves what they find there, and this augurs well for the progress of art in this country. All I would ask of them is not to be so startling.

Repose is one of the first qualities that we look for in a work of art, I do not mean the absence of all action, but I mean a completeness, a unity. I remember that Frederick Walker whom many consider one of our greatest modern artists, used to say that oneness (or unity) was the great quality that he was always trying for, and that he tried to compose his pictures so that they did not look as if they were composed, but as though every figure had taken its place naturally, and as it were by accident and not by design, and yet everything even to a hand must be in its right place, and he would rub out beautiful work over and over again until he had succeeded in getting every thing into its right place, and of its right tone and right colour. Nor were his pains and his labour thrown away, for his works as a rule are the most exquisite gems. A work of art is a thing that we love to live with and to make a friend of. We do not want it to fidget us, nor to tire us, nor perpetually to remind us how clever it is, but to give us calm enjoyment or great delight and to put us into a pleasant frame of mind. Let it then, whatever its subject may be, be so harmonious that the contemplation of it gives us peace. But we see so many pictures which produce the opposite effect that one would think that one of the great objects of art was to startle. Now the characteristic of all great art is, that it leads the eye gently, as Raphael's does, or it dances it along merrily, as that of Rubens does, to its principal thought, its chief beauty and leads the mind and the heart along with it. But in order to do this, we must study the laws of composition, not that they will make us compose good pictures, but they will help us in our difficulties and enable us the better to appreciate the merits of fine works, which is really of more importance to a great many of us, than enabling us to produce perhaps only second or third rate pictures.

So we must study the art of composition. That is, the art of putting every part of a work into such complete harmony, that it seems to sing to us as we contemplate it. Or, as Mr. Ruskin more properly expresses it in his "Elements of Drawing," "Composition means literally and simply putting several things together, so as to make one thing out of them, the nature and goodness of which they all have a share in producing." Without this there is no great art. There may be very good copying, but a mere copy from nature is not always of much value unless the subject has been chosen with such taste and painted with such love for it, that the artist recognised in his subject all his laws so completely attended to, that he felt it was impossible to alter anything with advantage; but to do that he must know the laws which we shall find govern nature in a subtle way, and also all good art without in the least interfering with originality, or forcing it to be conventional, but on the contrary putting the artist into a closer and more intellectual relation with nature, and enabling him with more ease to himself (and more enjoyment to those who look at his work), to depict the infinite variety of her beauties.

We must leave this subject and leave it incomplete, with much, very much more to be said about it. A most witty and intelligent friend of mine once said to me that if ever he had to give a lecture he would choose for his subject "The uselessness of lectures upon art;" and certainly there seems to be a good deal of reason in that remark, for a lecturer cannot teach in an hour that which it takes years of daily toil and thoughtful labour to accomplish. All that a lecturer can hope to do is to call the attention of those who are interested in the subject he takes in hand, and to leave them to follow out the study of it for themselves, if they feel so inclined. In this case of the study of the Beautiful, we have but to open our eyes to the things about us, and to seek for that beauty and goodness which at first seem hidden from us, but which, when once discovered, are everywhere visible, and give an interest and value to all the objects around us that before we never dreamt of, and it is important in this respect, that the greater the number of minds occupying themselves in this manner, that is, the more the beautiful be sought, be it external beauty of form and colour, or moral beauty of love and kindness, the greater is the chance of advancement and perfection of art; for your artist, your singer, or your actor, will paint, or sing, or act, with all the more enthusiasm, and take greater pains with his art when he has a full audience before him instead of an empty house. And in these days, when men's minds are perplexed with doubts, and when the political atmosphere is thick and threatening, surely it must be a pleasant relief to turn from these things to the study of that which should teach us to turn our spears into ploughshares and our swords into pruning hooks.

THE VENTILATION, LIGHTING, AND WARMING OF HOUSES.

THE second of a series of lectures to members of building societies, on Dwelling Houses, was given at the Parkes Museum of Hygiene on Saturday afternoon by Mr. E. C. Robins, F.S.A. In his opening remarks, Mr. Robins mentioned that the necessity for as frequent a change of air in a dwelling as was practicable, without causing perceptible draught, was the guiding principle in devising or considering systems of ventilation. This renewal of the atmosphere could only be effected by the admission of fresh air and the concurrent abstraction of foul air; if either end were alone aimed at, the attempt would be more or less a failure. In ordinary houses, the chimney was a sufficient ventilator when associated with a means of feeding the chimney with a supply of air. To feed the fire directly, however, would probably prevent draughts, but would decrease the warmth of the room and leave it unrefreshed by the change of fresh for expired air. It was obviously desirable, therefore, to introduce the air in such a way that it might do all the good possible before being swallowed up by the chimney. The ordinary current of air of a sitting-room fireplace was at the rate of about 366 cubic feet of air per second, and consequently allowing 1,000 cubic feet per hour as necessary to be extracted for each occupant of any chamber, then one sitting-room fire-flue was a sufficient extractor for 18 persons; or if 3,000 cubic feet were insisted on, as recommended by Dr. de Chaumont, then six persons were provided for by this means, which was all-sufficient for ordinary purposes. Proceeding on this assumption, Mr. Tobin had the credit of reviving an old principle laid down by Mr. Whitehurst, F.R.S., and published in 1794, and of putting it into successful practice—viz., vertical ventilating shafts, set into the corner of a room and communicating with the outer air on opposite sides of the house through gratings. In introducing and extracting air without draught, practical difficulties bristled at every point, and many devices had been contrived, as they could see around them in the museum, for effecting this object. He believed it to be quite vain to think that any one system, however successful in however many instances, would, under all circumstances, realise the same results. In the first place, if shafts were used, the admission of air had to be regulated according to the wind, &c. This might be done in many ways—by a hinged lid on the top with side cheeks opening towards the wall, or by a suspended diaphragm plate. In the next place, dust and smoke found their way into the room along with the so-called fresh air. At first, perforated zinc was put into the tube, and failed; then cotton wool was lightly put over, which upset the whole principle by checking the current. The Sanitary Engineering and Ventilating Company had distinctly improved this by placing a tray of water in the horizontal portion of the pipe, and deflecting the in-current over it. But as this water would freeze in the winter time, a canvas bag, stiffened by a wire frame, had been substituted and placed in the pipe, so as to strain the air received. Double-hung raising sashes gave an in-current of air, by the familiar expedient of raising the lower sash 2in. upon a strip of wood. The same end could be effected by hit-and-miss ventilators, placed over slots in the meeting-rails of the sashes. In Currall's patent, air was admitted through the pierced bottom rail of sashes. The only other modes of introducing cold air directly with an upward current at a low level, were by Pierce's pyropneumatic, Boyd's hygiastic, and H. S. Snell's thermohydric stoves. In all cases, the in-current had not an upward tendency of more than 45°. Stevens' drawer ventilator was an attempt to achieve a vertical current from a side opening, but was not sightly. Numbers of stove-makers—Boyd, Edwards, Batty, and others—admitted fresh air through the stove-fronts, a valuable means of inlet, because of the ease with which it could be regulated, and because in winter-time the in-coming air was warmed in its passage. It was therefore economical of fuel to reject in favour of this plan any system for introducing crude cold air, as on the Whitehurst principle. Hit-and-miss ventilators had been placed in door or wall between passage and room, but had to be modified on account of the direct draught they occasioned; Currall's door ventilators were invented for this purpose, and a further improvement had been devised by Mr. Mark H. Judge, in the architrave ventilator. The lecturer expressed a preference for vertical inlets of air, and recommended that where these could not be obtained, the air should not be introduced directly, but through a flue built directly into the wall at a lower level than the opening into room. Passing on to consider extract ventilators, the lecturer said he was not favourable to Dr. Arnott's chimney-valve nor its varieties, as they easily become clogged with smoke and allowed a sooty down-draught to enter when the fire was not lighted. He preferred a separate flue for air going up between the heated smoke-flues, and so sufficiently heated to cause an upward current. This special flue should be pargetted, and should not open at the top of the chimney-stack on the same level as the smoke-flues, but through louvres on opposite sides of the stack, and 3ft. from the top. If this plan was objected

to as too costly, they might adopt the simple but effective plan suggested by Mr. Boyd 30 years ago.—viz., instead of making the withes between the flues of solid half-brickwork, to provide a hollow flue by the use of cast-iron flue-plates the thickness of a slate, thus leaving a clear 4in. space always warmed for the air passage. Ordinarily there was sufficient updaught to make these act as extract ventilators, provided an equal area of inlet ventilators existed in the room; but if these were deficient there were several simple mechanical means for creating an up-current. Kite, Howorth, Verity, Boyle, Buchan, Banner, and a host of smoke-doctors had devised cowls turned by the wind, but exhaust shafts of the kind he had recommended, ending in louvres 3ft. below the chimney tops, could not be provided with cowls, and motive power must be applied at the foot of the shaft, as in the form of the Bunsen burner gas-jet provided by Boyd at the base of the upcast shaft. Mr. Potts, of Birmingham, had attempted, with considerable but not unvarying success, to effect the introduction of fresh air and the exaction of foul air simultaneously at the upper rt of a room by a pierced cornice divided at e back by a metal diaphragm, and the outlet ue was supplemented either by a gas-jet below or a cowl above. These and other systems of ventilation were, Mr. Robins mentioned, fully described and illustrated, in a shilling book, by Mr. W. Eassie, C.E., entitled "Healthy Houses." Passing on to the subject of lighting rooms, he admitted that the softest and most agreeable mode was by wax candles; but it was too expensive except for drawing-rooms and the boudoirs of the rich. The inconvenience attending the preparation and cleaning of oil, paraffin, and other lamps had led to the general adoption of gas, which was recommended alike by cheapness, by its ready application, and by brilliancy of the light afforded. It was usually supposed, however, that gas was more destructive of oxygen than lamps or candles. This was true; but the impurity was not greater when compared with the larger quantity of light afforded. If, as Dr. Corfield had shown, instead of using five or six burners without any provision for the escape of the products of combustion, we employed fifty or sixty sperm candles, under the same conditions, there would be a fair comparison. Several manufacturers had provided for carrying the products of gas-combustion, availing themselves of the heat generated by the process for this purpose, including Messrs. Strode and Co., in their sunburners, Messrs. Benham and Sons, in the "globe" light (which had a tubular suspension-rod above, communicating with the chimney flue); a still simpler and less expensive arrangement was Messrs. Faraday and Sons' ventilating gas-pendant, and a globe-reflector had been designed by General Franzini, in which two hemispheres of crystal, one of opal, the other a bottle of filtered water, were placed round the light, which was magnified by it; a conducting tube removed the products of combustion. The same inventor had contrived the "Healthy" light, consisting of two jets blending into one flame, on a similar principle to that of the Silber Light Company. Gas-burners, generally, should be provided with some disc, or other means of checking the pressure; they should be made of some corrosive material, and should have large orifices. The lecturer expressed the belief that the electric light would soon be a household thing, and then they would have no products of combustion to think about, and no injury to furniture and frames to deplore. Proceeding to his concluding topic, that of warming, he advocated, as the end to be arrived at, the equable warming of the whole interior of the house, rooms, passages, and staircase alike. The salvation from the wasteful consumption of fuel was the withdrawal of the cause of draughtiness of rooms, the difference in temperature between the sitting-room and hall. For stoves in halls, gas might be usefully employed, as it required neither tending nor space. For rooms, he did not think we should dispense with the open fire, than which nothing could be more healthy, cheery, or wasteful; and that being so, attention should be directed towards its improvement. The primary aim must be the increase of its radiating power by reflection from heated polished surfaces. One of the best forms was where the fire-cheeks were of polished steel, set at an angle of 45° with the back of stove, and projecting in front of the fire-bars; many old-fashioned stoves were constructed in this way. The latest improvement in this way was the register-stove patented by Messrs. Comyng, Ching, and Co., called the "Paramount," in which the fire-grate was quite disconnected from the brickwork, and equally so from the metal shell or encaustic-tile lining of the chimney-back and sides, except at the bracket which supported it, thus giving free space for radiation all round, economising fuel, and allowing the stove to be carried from one room to another. The valuable series of stoves made by Barnard and Bishop, of Norwich, heated by direct radiation, and had no reflecting surfaces; the bottom of the grate was closed, causing a slow combustion of fuel, and was slightly inclined to the hearth, and the fuel was all spread out next the front bars. The depth of these stoves was generally too small, and he preferred the larger sizes, and those with bent lower bars to prevent the fuel from caking. These were not ventilating stoves, but there were many in the museum of that character, including those already mentioned, and that of Captain Galton. A new open fire-stove had just been brought out by Mr. Boyd, which was disengaged from the wall, and inclosed in a case, and had an inlet flue through the wall feeding the space under the iron hearth. Mr. H. Saxon Snell's and other hygiastic ventilating stoves warmed the air of a room both by radiation from the open fire, and by the conduction of fresh air over heated surfaces. The latest thing in economic warming was the "Lambeth Radiating Tile Stove," now being introduced by Messrs. Doulton. Mr. Robins said he should not describe the various systems of heating by high and low pressure hot-water apparatus, or by heated air and steam, as he thought, when the electric light was laid on to houses it would be time enough to lay on steam, and that then the engines required to maintain the electric current could be utilised to supply heat also.

A SANITARY PROTECTION ASSOCIATION FOR LONDON.*

By Prof. Fleeming Jenkin, F.R.S.

In the winter of 1877-78, the writer was asked to deliver two lectures on Sanitation before the Philosophical Institution in Edinburgh, and he gladly accepted the duty, believing that there would be no great difficulty in giving simple explanations on the subject, and in laying down rules so simple that each householder might easily apply those rules to his own case, and so render himself secure against the chief dangers arising from bad drainage, bad water supply, and bad ventilation. The writer holds the opinion that, while niceties of construction cannot be too warmly debated among munufacturers and engineers, they are, nevertheless, of small importance in comparison with a few very simple conditions, the observance of which will practically ensure that a house is in good sanitary order. Very briefly, these main conditions may be stated as follows:—

1. The liquid refuse from the house must have a free passage to the town sewer.
2. The air from the town sewer must not have a free passage into the house-drains.
3. No air or gas from the drainage channels of the house must enter the house.
4. No water or liquids must leak from those channels into the ground under the house.
5. The drinking-water must be supplied and stored in such a manner as to run no risk of contamination.
6. The air of the dwelling-rooms must be supplied from without, uncontaminated.

By the time that the preparations for the lecture were complete, the writer had arrived at the discouraging conclusion that its delivery would be practically useless—that it would add little or nothing to the knowledge of experts, and that the ordinary householder could not be expected so completely to master the subject as might warrant him in trusting to his own judgment when applying the principles. What conclusion then was to be drawn? Apparently, only the very lame one, that each occupier ought to call in professional advice, to see, in the first instance, that proper arrangements had been made, and from time to time to inspect whether they continued in working order. But what advice could the public obtain? The plumber and builder were interested parties, and in many cases were insufficiently educated to give sound advice. The engineer, if consulted, must be a man of standing, and would charge a fee such as would be prohibitory in the case of houses belonging to persons of moderate means. The lecturer, then, was in the position of having to tell his hearers that the water-carriage system, as it is called, had introduced into their houses a very serious danger; that the complexity of pipes and traps was such that this danger could not be guarded against without professional advice and continual inspection, and yet that no practical means existed, by which men of moderate means could obtain trustworthy professional advice. This conclusion was so unsatisfactory, that he was led to consider whether no plan could be devised for giving sound professional advice and inspection in return for small fees. The idea then occurred to him that the principle first applied by the late Sir William Fairbairn, to the inspection of steam boilers, was also applicable to the inspection of houses. An association might be formed, which should employ an engineer or engineers of their own. Each engineer so employed could inspect and report on a large number of houses annually, and if employed exclusively on this work, he would rapidly acquire great skill and experience. The writer knew that large numbers of well-educated young men, who passed through his class in the University, and through their practical apprenticeship, would be glad to give their time for about £150 per annum. If these men were to inspect houses, and report upon them under the eye of a consulting engineer of standing, the householder would have a guarantee that the principles on which the reports were drawn up, and the inspections made, were such as commanded the assent of the heads of the profession; and, nevertheless, the fee of the consulting engineer who gave this guarantee need not be more for, say, 100 houses, than he would have to charge for a single house if he were called in for that one special case.

An estimate showed that, including the payment of a secretary, rent for offices, and sundry minor expenses, the proposed benefits could be given in Edinburgh for a subscription of £1 1s. per annum, an estimate which has since been justified by an experience of three years.

The idea was explained privately to a few friends, and met with so much favour that draft rules were passed, and a circular issued.

The rules of the association were revised by the provisional committee, consisting of leading citizens in Edinburgh, and the writer was able, at his lecture before the Philosophical Institution, just three years ago, to announce that the association for Edinburgh was constituted; since that time, and under those rules, the association has worked with perfect smoothness and success. It has given satisfaction to its members; it has paid its way; it has spread widely through Scotland, and its action has in no instance given rise to any challenge or ill-feeling. Under these circumstances, the Council of the Society of Arts accepted the present paper, by which the announcement is made that a similar association is now founded in London.

The rules of the London Association are appended. They differ little from those of the Edinburgh Association, and such differences as exist have been adjusted by the London Council. The following abstract will probably be sufficient to explain what the association undertakes to do. The objects are defined as follows:—

1. To provide members, at m derate cost, with such advice and supervision as shall insure the proper sanitary condition of their own dwellings.
2. To enable members to procure practical advice, on moderate terms, as to the best means of remedying defects in houses of the poorer class in which they are interested.

The entrance fee, which entitles to all privileges of membership for twelve months, is £2 2s. for houses situated within five miles of Charing-cross, and rated below £400 per annum. The subsequent annual subscription for the same houses will be £1 1s. Special rates for larger houses can be ascertained from the Secretary.

The following are the privileges of the members:—

1. A report by the engineer of the association on the sanitary condition of one dwelling, with a sketch diagram of pipes, and specific recommendations, if necessary, as to the improvement of drainage, water supply, and ventilation.
2. The inspection of any alterations in the sanitary fittings which may be carried out by the advice, or with the approval, of the officers of the association.
3. An annual inspection of premises by the engineer, with a report as to their sanitary condition.
4. Occasional supplementary inspection and advice concerning the dwelling or property in respect of which he is a subscriber, whenever this advice may be desired. The fee for such occasional advice will be fixed from time to time by the Council.
5. Reports by the officers of the association as to the

*Part of a Paper read before the Society of Arts, Jan. 12.

sanitary condition of any dwellings or properties designated by any member, or on any plans for proposed buildings, on payment of a fee to be fixed by the Council from time to time, with special relation to the rent, or estimated rent, of the premises.

6. A vote in the election of the council, who manage the affairs of the association.

Any member is free to leave the association at any time; non-payment of the annual subscription will suffice to cause the removal of his name from the roll. The association has no share capital and no profits. The Board of Trade has signified their willingness to license the Edinburgh Association as one of public utility under the Act of 1867, Victoria 30—31, c. 131, and the Board will, no doubt, be prepared to grant an equal priviledge to the London Association.

The council of the association will, by its articles, be unpaid; the officers have no interest in any outlay or patent

The first council will be constituted as follows:—President, Prof. T. H. Huxley, LL D. F.R S., &c. Ordinary Councillors, J. S. Bristowe, M.D., President of the Society of Medical Officers of Health; Sir Wm. Gull, Bart, M.D., D.C.L.; Rev. Harry Jones, rector of St. George's-in-the-East; Hugh Leonard, late Engineer-in-Chief, Bengal Presidency; F. Clifford de Lousada, retired commander R.N.; Sir W. Tyrone Power, K.C.B.; E. C. Robins, F.R.I.B.A.; J. S. Burdon Sanderson, M.D., LL.D., F.R S.; Sir Henry Tyler, M.P.; Prof. Alex. W. Williamson, F.R.S., &c. Honorary Standing Council, Alfred Wills, Q.C. Honorary Treasurer, T. Holmes, M.A., Cantab., Surgeon, and Lecturer on Surgery at St. George's Hospital.

The following will be the first paid officers of this association, holding office at the will and pleasure of the Council:—Consulting Engineers, Fleeming Jenkin, F.R.S., M.I.C.E., Professor of Engineering in the University of Edinburgh and Consulting Engineer to the Edinburgh Sanitary Protection Association; and H. C. Forde, M.I.C.E. Resident Engineer, W. K. Burton. Secretary, Cosmo Innes, M.I.C.E., 6, John-street, Adelphi.

A short account will now be given of the manner in which the system is practically worked. A householder or tenant who thinks of joining the association will write to the secretary, Mr. Cosmo Innes, at 6, John-street, Adelphi. In his letter he will state the nature of the premises in respect of which he wishes to subscribe. He will mention the rateable value or actual rent, and the situation of the house. If the situation be within five miles of Charing-cross, and the rateable value of the house under £400, he will know that the terms of the subscription are £2 2s. for the first year, and £1 1s. for each subsequent year. He may either ask the secretary for further information, or he may at once signify his intention of joining the association as a member, and inclose a cheque for £2 2s. He may, if he pleases, call and obtain verbal information from the secretary. When a member joins he incurs no liability, except for the first two guineas. He may or may not pay any subsequent annual subscription; but it is hoped that most of the members who join will remain members of the association, since otherwise they will not receive the full benefit of the scheme. As soon after the member has joined as circumstances allow, the secretary will write to the member, and inquire when it will be most convenient to him to have his house inspected. When the inspection is arranged, the member will be asked to let his plumber to meet the inspecting engineer, and also to have the ground opened up in such a manner as to expose the main drain of the house at some point between the house and the town sewer. If the extra expense which this entails is objected to, the inspection cannot be thorough, but may still be useful. The sums paid for opening up the ground do not pass through the hands of the association. Unless some grave defect is discovered in the drain under the house, the opening up of the drain, being done outside the house, need cause no inconvenience to the inmates. The engineer inspects the condition of the main drain, and, assisted by the plumber, takes notes of every pipe, trap, and sanitary convenience in the house; he makes inquiries as to smells and ventilation; he examines all cisterns and arrangements for water supply. When this is practicable, he tests the condition of the pipes by pouring paraffin, or some other volatile strong-smelling substance, into the drainage system from the roof. If the smell can anywhere be detected inside the house, a flaw is thereby indicated; this is then laid bare. As soon after the inspection as may be, the member receives a detailed report, describing the condition of his house, accompanied by a sketch diagram showing every pipe and trap; recommendations for improvements are made when necessary, as is usually the case, and some rough estimate can be given of the probable cost of those improvements when this is desired. The improvements recommended are those only which are shown by every-day experience to be necessary. The wishes of the occupier are taken into account, and the more important are distinguised from the less important alterations. The recommendations made are sufficiently specific to enable the member to obtain an estimate from his plumber or builder of the cost of carrying them out. The cost is often considerable, but the member may feel assured that the association has no interest whatever in recommending any expenditure.

The interest of its officers is in the other direction. The less that is done to a house the less trouble they will have. The less that is done the more popular the association will be. It is, however, only fair to state that, in the great majority of cases, subscription to the association leads to an outlay in the first year largely in excess of the two guineas. This outlay does not pass through the hands of the association. If the member decides to carry out the recommendations made, or any of them, and gives the secretary notice of his intention, arrangements will be made to inspect the work when completed, or nearly completed. This inspection of the plumbing and other work is one of the most valuable privileges which the member obtains by joining the association. When the alterations have been satisfactorily completed, the member can, on application, obtain a certificate as to the sanitary condition of his premises. This certificate will be of great value to hotels, lodging-houses, and schools. The recommendations made to members invariably include such arrangements as will preclude the necessity for ever again incurring expense in opening up the drain for inspection.

At this point the writer feels that probably all present believe more has been promised than can possibly be performed for the money. This feeling will not be least strong among those best qualified to give an opinion. The writer can, however, speak with the authority of complete experience. It has been shown that these services can be rendered in a thorough and efficient manner, by one resident engineer, for 450 houses or even 500, in one year. The reports, sketch diagrams, and letters in Edinburgh are open to the inspection of all whom it may concern. During three years there has not been one case of complaint that the houses were not thoroughly examined, or that the reports were not sufficiently detailed. At the annual meeting, member after member has risen to express his sense of the thoroughness of the work, and Scotsmen are not easily deluded or even satisfied on this point. At the outset the writer could only plead his own conviction that the work could be done. He is now able to say that, in 1,200 cases, it has been done.

The second inspection is a much simpler matter; when the guinea for the second year has been paid, the resident engineer visits the premises, assures himself, by ocular inspection, that there is a free outfall of sewage; paraffin or its equivalent is again poured into the drainage system, and a thorough search made for dry traps, broken joints, or worn-out lead. If the pipe under the house has been laid afresh, in accordance with the association's specification, it is tested, to ascertain whether it remains watertight. Inquiries are made as to any alterations which may have been made since the last visit. The condition of the cisterns is examined. The member then receives a second report, in accordance with the facts of the case. This practical and experimental inspection is repeated year after year; it entails no cost beyond the guinea, and no inconvenience. It renders the member practically secure that no imperfection in the drainage system can remain long undetected. More frequent inspections could be arranged for at cheap rates, in special cases, such as schools, where injuries are more likely to occur. The association, therefore, does not appeal only, or even mainly, to those who have reason to believe that there are grave defects in their houses. Its chief business begins when the house is in good order. The householder is then in a position analogous to that of a manufacturer who has bought a good steam-boiler; he knows that the apparatus is good, but liable to decay and derangement; he employs the principle of co-operation to obtain skilled supervision to protect him from the consequences of that decay or derangement. A less measure of inspection than is offered will not protect a house from the dangers inseparable from the system of water-carriage for sewage.

There are other minor functions which the association will fulfil.

It will examine plans of projected buildings for architects and builders. This provision is taken advantage of to a considerable extent in Edinburgh.

The association will also examine houses for persons who propose to take them on lease, or for landlords who propose to let houses.

If a member desires a report on the condition of some other premises than his own, such as lodgings occupied by the poor, a report will be made at moderate rates, as a matter of special arrangement. All these reports are strictly private and confidential.

All the objections raised in Edinburgh experience has shown to be of no value, but there remains one objection which will always be serious. Persons shrink from becoming members because they fear that by enrolling they will be led to expend a considerable sum of money in sanitary improvements. "I do not mind the two guineas," they say, "but I shrink naturally from the fifty guineas which this may entail." The objection is valid, but yet it sounds strange when it is urged by a person who says, "I know my house is in very bad order; it was built long ago; rats abound; smells pervade, and we are much troubled by sore throats." What expenditure of money is justifiable if not that which tends to secure good health? No doubt the hesitation is partly due to a doubt whether the sanitary engineer really knows anything at all about the matter. The association does its best to remove that doubt; the reports explain what is wrong, why it is wrong, and what will put it right. The member is left to his own common-sense as a guide whether he will follow the recommendations made. It is a matter of no pecuniary interest to his adviser whether the job is done or not, and that adviser is selected and watched by a council consisting of men as well qualified for this purpose as can be found in London.

CHIPS.

Mr. Nicholas Little, of the firm of Little Bros., of Dungannon, builders and contractors, was killed on Saturday, while superintending the building of a new steam-packet wharf wall at Dundalk quay, for which his firm were the contractors. Stones from the débris of the wall were being raised in a bucket worked by a derrick, when the iron jib snapped, and fell upon Mr. Little's head.

The annual meeting of the Walsall School of Art was held on Monday evening, when a report of a satisfactory character was read, and the prizes and certificates were distributed.

The town council of Halifax received last week a report from the gas-committee, recommending that a new gas-holder be constructed at Stoney Royd, and that Mr. Carr, the gas-engineer, be employed to prepare the necessary plans and specifications at a commission of 2½ per cent. The gas-holder would be on brick foundations, would hold 1,500,000 cubic feet of gas, and was estimated to cost £15,000. The report was adopted, after an attempt by a minority of the council to invite some one else to prepare plans.

A stained-glass window has just been placed in the parish-church of Old Buckenham, Norfolk, as a memorial. The subject is the parable of the "Good Samaritan," and the work was executed by Messrs. J. and J. King, of St. Andrew's, Norwich.

The new Oxford University Boat-house, erected from designs by Mr. J. O. Scott, on the Berkshire side of the river below "Saunders' Bridge," which was with n a fortnight of completion, and which we illustrated on July 16th last, was burnt to the ground on Saturday night, together with some 30 or 40 eight-oared and other boats belonging to the University and the colleges, which had already been housed there. The contractors (Messrs. Silver, of Reading), were insured for £1,500; but the building had cost about £2,500, inclusive of the concrete foundations, which are uninjured.

The management of the London office of the Gateshead Stained Glass and Art Pottery Companies has been taken up by Mr. E. E. Pither, who is already well-known among architects and builders. The office, 53, Mortimer-street, Cavendish-square, has been converted into an art studio, comprising in addition, samples of stained glass and art pottery, tapestries, hammered brasses, &c.

At the general meeting of the diocesan board on the 10th inst., Mr. John D. Sedding, of 18, Charlotte-street, Bedford-square, was unanimously elected as diocesan architect for Bath and Wells.

Reopening services were held in Darnall parish-church, near Sheffield, on Thursday, the 6th inst., after the rebuilding of chancel end, from the designs of Mr. E. Eldon Deane, of London.

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ILLUSTRATIONS.

SALL CHURCH, NORFOLK.—CHATEAU OF ST. GERMAIN.—BOLTON INFIRMARY.—OLD HOUSES, CHRISTMAS-STREET, BRISTOL.—OLD HOUSE, ST. PETER'S CHURCHYARD, DERBY.

OUR LITHOGRAPHIC ILLUSTRATIONS.

SALL CHURCH, NORFOLK.

We have reproduced these drawings of Sall Church, by Mr. T. C. Yates, in order to illustrate Mr. R. C. Pink's lecture on Norfolk churches, delivered last Friday before the Architectural Association, and reported to-day by us on page 35. This fine building is an admirable example of Norfolk parish-churches of the larger type. The plan is cruciform with the rather unusual arrangement in so large a church of an aisleless chancel. The stalls in the choir return on the west side, and a fine screen remains. The transepts are rather small in size, and a porch with parvise over is provided on the north as well as on the south sides. The arch into the tower is a splendidly large and well-proportioned example, and the richly-carved and massive hoist supporting the font-cover is almost unique. The benches throughout the church are original, and the roof is one of the finest in the county. The church is unrestored, and in a most neglected and dilapidated condition.

THE CHATEAU OF ST. GERMAIN EN LAYE.

The sketch is of the N.E. façade, which looks out upon the forest and the great terrace of Louis XIV. The N., S., and E. wings of the building—the work of Francis I., as reconstructed by Henry IV.—have now been almost entirely remodelled by the restoration still in progress. Only the entrance front remains untouched. The workmen are at present engaged on the Cour d'Honneur of Francis I. and the chapel of St. Louis. The sketch shows two of the four pavilions built by Mansard, in the reign of Louis XIV. The donjon was the castle of Charles V., and is the earliest work at St. Germain, no remains of the still earlier fortress being now traceable. The buttresses, which were brick in the original work, have been everywhere rebuilt in stone. The wall-surface is finished in plaster of a colour which goes well with the brickwork. Throughout the building the upper part of the cornices are constructed of stone and the bed mouldings in brick.—JAMES. B. STEWART.

BOLTON INFIRMARY.

The new infirmary at Bolton, which we illustrate, was commenced in the spring of 1879, and, in all probability, the building will be ready for occupation by autumn next. The infirmary consists of four distinct buildings—viz., the administrative block (which is placed in the centre), the right and left pavilion, and the Children's Hospital (at the back of the left pavilion). The corridors connecting them are one story only in height, so as not to interfere with the free circulation of air. The administrative block contains on the ground-floor the principal entrance-hall, board-room, secretary's office, matron's and surgeon's day-rooms, operating-room, and small occasional ward, also the kitchens, larders, servants' hall, lavatories, &c. The upper floors are appropriated for surgeon's, matron's, nurses, and servants' bedrooms, with requisite bath-rooms, &c., the plan being so arranged that each department is kept thoroughly distinct. In the centre of the front, over the entrance-hall, a tower is carried up to a total height above the ground of 103ft. The upper portion of this could be utilised for water tanks. The right pavilion (that nearest the tower) contains the entrance for patients, with its accident-receiving rooms, &c, also the dispensary and out-patients' departments. The latter consist of a large waiting-room, also medical and surgical, consulting, and examination rooms, lavatories, &c. The house-porter's apartment is placed here, and is in such a position as to control both the entrances. A small ward, capable of taking three beds, is also placed on the ground-floor. On the upper floor is a large ward for 14 beds, and a smaller one for three beds; also nurses' day and night rooms. The left pavilion has on the ground-floor a large ward for 14 beds, and two occasional wards for three beds each, also nurses' day and night rooms. The upper floor is similar, but with only one small ward. Both the pavilions have balconies at the end for the use of convalescents. The children's hospital, which has been placed so as to overlook the park, is a one-story building, containing two wards for eight beds each, a recreation ward or play-room, lavatories, &c., also nurses' day and night rooms. A terrace is provided, communicating with the wards for the use of convalescents. These wards are so arranged that they can be completely isolated from the main building. The sizes of the wards are as follows:—Large pavilion 59ft. by 27ft., cubic space for bed 1,820ft.; small wards 22ft by 16ft. 6in., cubic space for bed 1,377ft.; children's wards 35ft. by 26ft., cubic space for bed 1,700ft. The total number of beds is as follows:—Men's wards, 42 beds; occasional wards, 17 beds; children's hospital, 16 beds: total 75. The principal corridor extends from end to end of the building, with a total length of about 300ft. The pavilions are provided with hydraulic lifts for patients, and hoists for raising dinners and coals to the upper stories. Shoots are also provided for dirty linen, dust, &c. Fireproof construction has been adopted throughout. The heating of the wards is by Hayden's system of central fireplaces, which combine open grates with hot air and ventilation. In these and in all sanitary matters the most modern improvements have been adopted. The materials employed are brick, with Yorkshire stone dressings, and the roofs are covered with green slates from Elterwater. The amount of the contract is £19,250. The tender of Messrs. J. H. and G. Marsden, builders and contractors, of Bolton, was accepted. Mr. R. K. Freeman, of Bolton, is the architect.

OLD HOUSES, CHRISTMAS-STREET, BRISTOL.

To the lover of that style of domestic architecture which finds its expression in forms of timber and plaster, the ancient city of Bristol affords many excellent examples, provided he does not object to explore some of its narrowest streets. The accompanying sketch is an example which, from its simplicity, rather than from its display of elaboration, arrests the eye of the passer, and claims his attention before he proceeds to mount the Christmas steps. The adjoining property, though externally of no architectural importance, and only marked by the label of the 15th century archway, leads to the remains of an historic building, the hospital of Bartholomew's, which dates from 1220; it was purchased by one Robert Thorne eight years before the dissolution of monasteries; he there founded the Bristol Grammar School, which, however, has since, on two occasions, been removed to different sites. The "steps" alluded to, and of which the commencement appears in the sketch, lead to the higher part of the city; on either side are old houses, entered from the landing-stages which occur at intervals. On reaching the top and turning round the *coup d'œil* is particularly impressive. At this point, on both sides, are curious stone *sedilia*; those on the right, under the chapel of the Three Kings of Cologne (1481), bear a mutilated tablet with inscription informing the reader when, and under what auspices, the steps are formed; the date inscribed is 1669.—J. A. S.

OLD HOUSE, ST. PETER'S CHURCHYARD, DERBY.

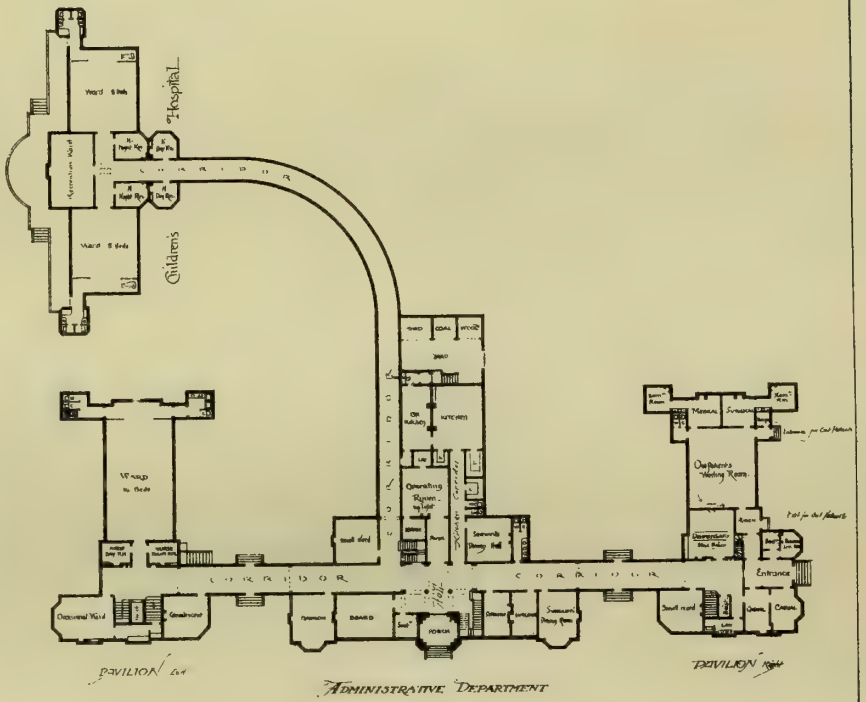
There appears to be little known about the history of the very interesting old house of which we give an illustration; but so far as we have been to make out, it was built about 150 years ago by a Mr. Jackson, as a private residence. It, however, passed out of his family for some years, and was used as a school. Since the sketch was made, it has unfortunately been mutilated by the destruction of two orginal gables at the sides, and substituting projecting eaves. We have upon one or two previous occasions given illustrations of other old houses in Derby, but this is almost the only perfect specimen now remaining.

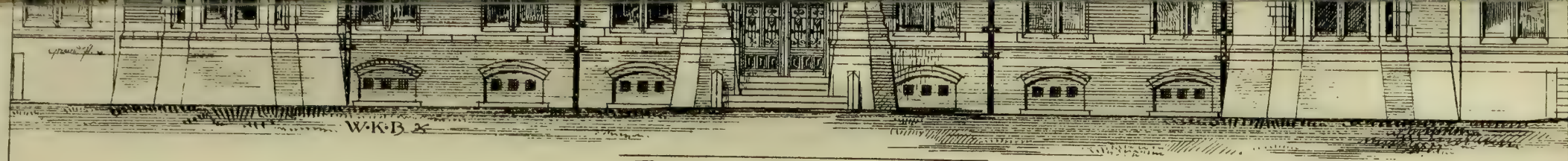
THE INSTITUTION OF CIVIL ENGINEERS.

MR. JAMES ABERNETHY, F.R.S.E., the lately-elected president, delivered his inaugural address on Tuesday evening. After referring to his own long connection with the society, Mr. Abernethy proceeded to give a sketch of the state of harbour and dock engineering, his own branch of the profession, in 1848-50, as contrasted with the developments of the present day. In the 30 years referred to the accommodation for shipping afforded by the 18 principal ports of Great Britain had increased from an average water area of 46 acres to one of 107 acres, and the depth available at high water of spring tides from 23½ft. to 29ft. The principal cause of this great development was to be ascribed to the increased number and dimensions of ocean steamers, which had advanced from the Atlantic wooden-paddle steamer of moderate dimensions in vogue in 1850 to screw steamers built of steel between 500 and 600ft. long, and with engines up to 10,000 horse-power. Turning to the Continent, the most notable increase in dock accommodation was to be found in the Low Countries; but France, Spain, Austria, and Russia were all carrying out important works in this direction. India and the Colonies were also engaged in like enterprises, notable among which was the nearly completed harbour of Madras, which would be finished during the present year, and would afford a safe and commodious water area of 200 acres in place of the present exposed roadstead. The great rivers of the United States rendered docks less imperative in that country than elsewhere, but the Government were carrying out improvements in the mode of access to the rivers by dredging and training the banks. Reverting to this country, it was to be regretted that the canal system had been suffered to fall into neglect, as with improved means of working the locks, the use of steam-power for towing, and protection of the banks, they would still constitute valuable accessories to the railways, especially for the carriage of heavy goods. The value of inland navigation was fully recognised by the Dominion of Canada, which would shortly possess one of the most extended systems of waterways in the world suitable for sea-going steamships, and affording great facilities for the conduct of traffic between the Western parts of the Dominion and of the United States, and Quebec, Montreal &c. The advantages derived from the Suez Canal had been very great, but Count de Lesseps' new enterprise at Panama would, if carried out, be even more beneficial to the world. The chief difficulty in the way of its successful execution was the provision of the safe means of discharging the land-water in times of flood. The means proposed were explained by Mr. Abernethy, who referred to the rival scheme by Nicaragua. The question of floods was attracting attention in England, where an improved system of drainage in the Midlands had so facilitated the quick passage of the rainfall, that the ordinary river-beds were no longer sufficient, and their overflow in the winter was becoming chronic. The most appropriate of remedies were suggested by the President, who, in concluding his remarks, claimed that the members of the Institution and of other similar bodies had not been behindhand in carrying out works tending to "direct the great sources of power in nature for the use and convenience of man."

LIBRARY

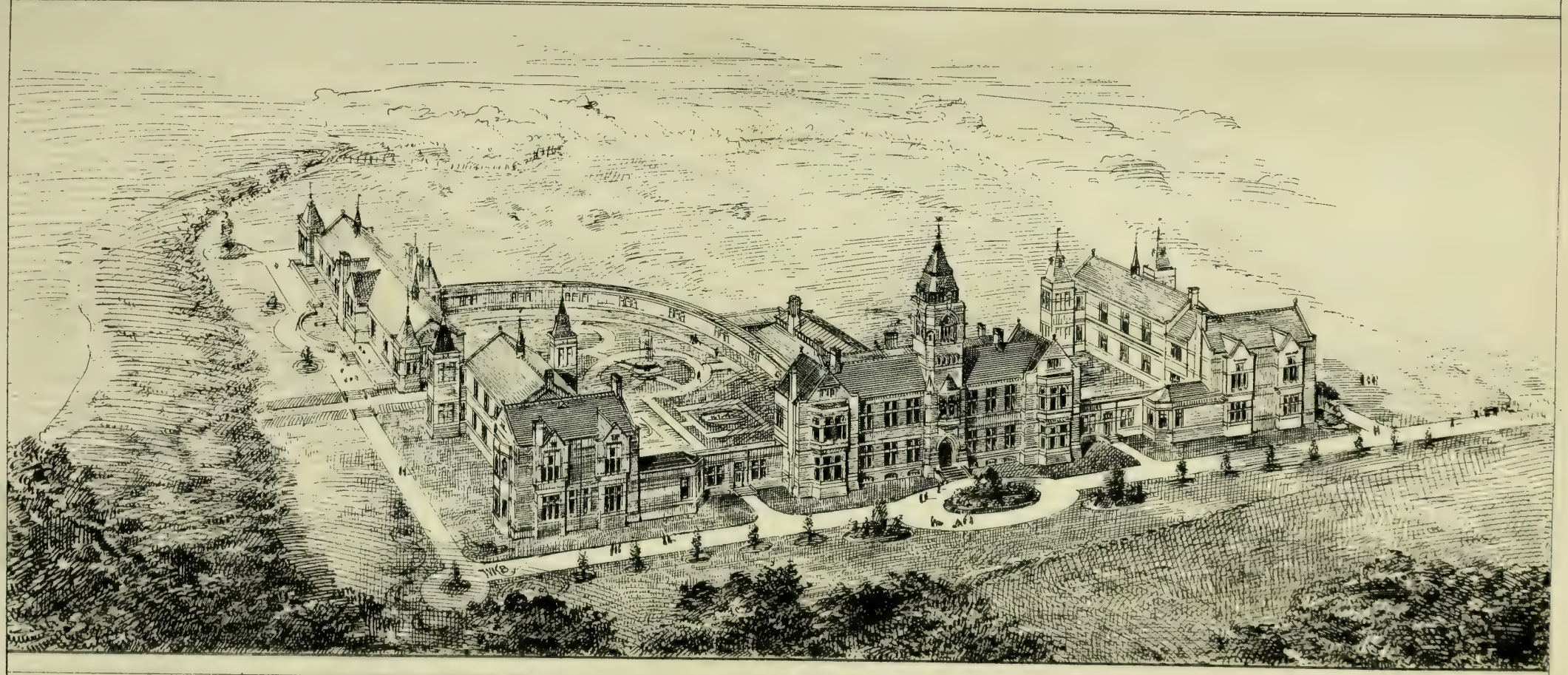
General Plan
BIRD'S-EYE-VIEW
of INFIRMARY
for BOLTON-le-MOORS





Front Elevation

Administrative Block

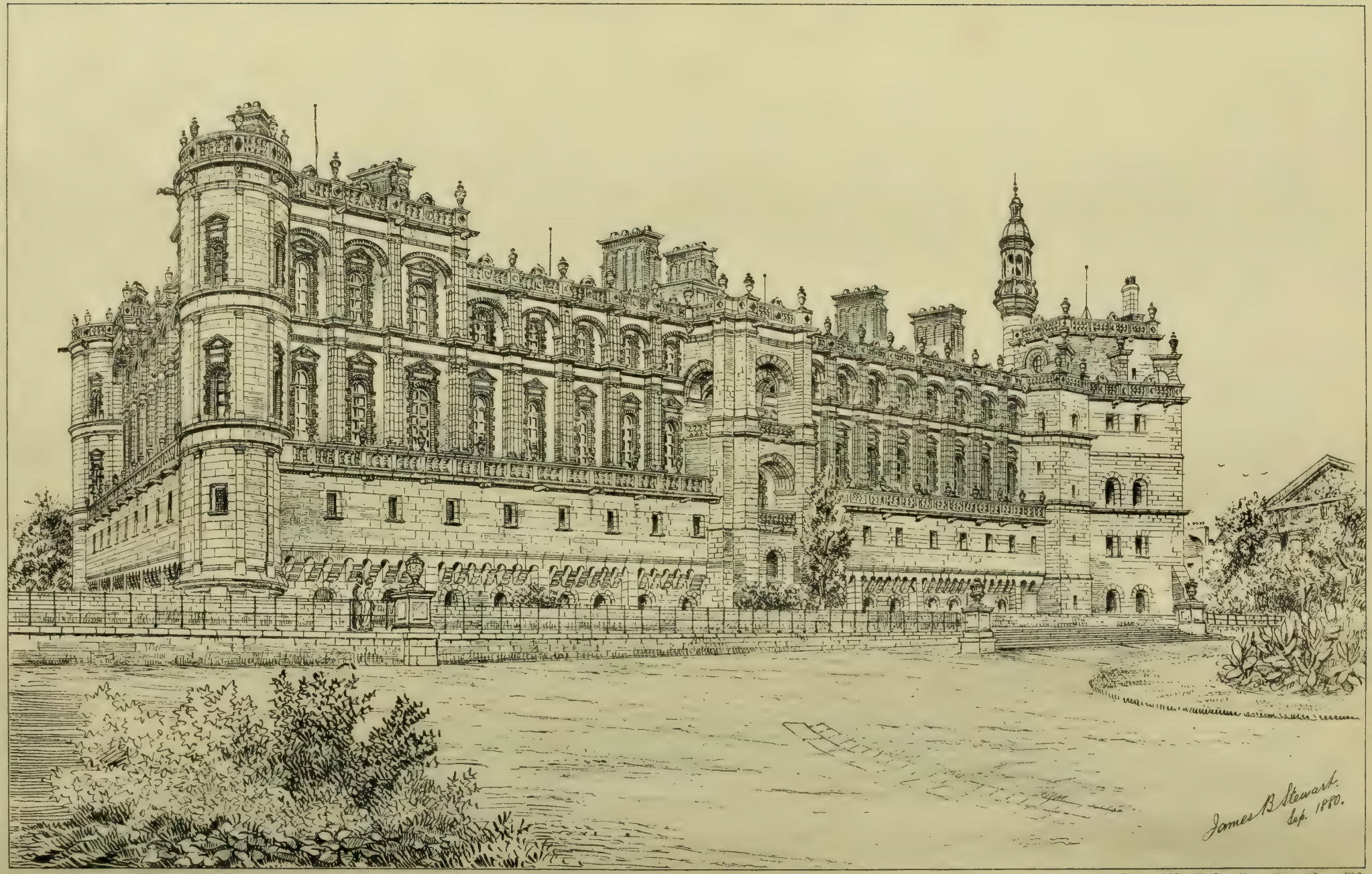


General View

Bolton Infirmary.

R. K. Freeman, Archt. &c
Bolton and Derby

Photo Lith. printed & Published by Chas. Ackmann & Queen Square W.C.



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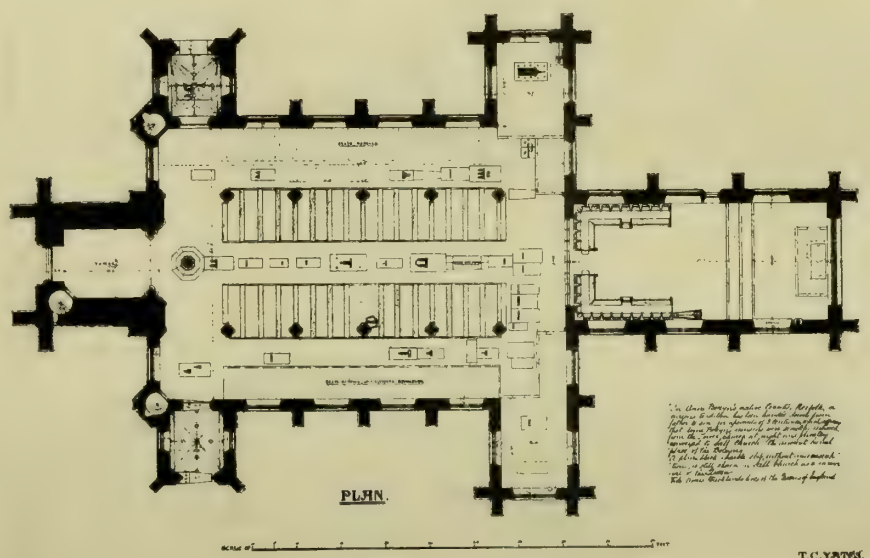
CHATEAU OF ST GERMAIN

SALL CHURCH NORFOLK.



PLAN.

T.C. YATES.

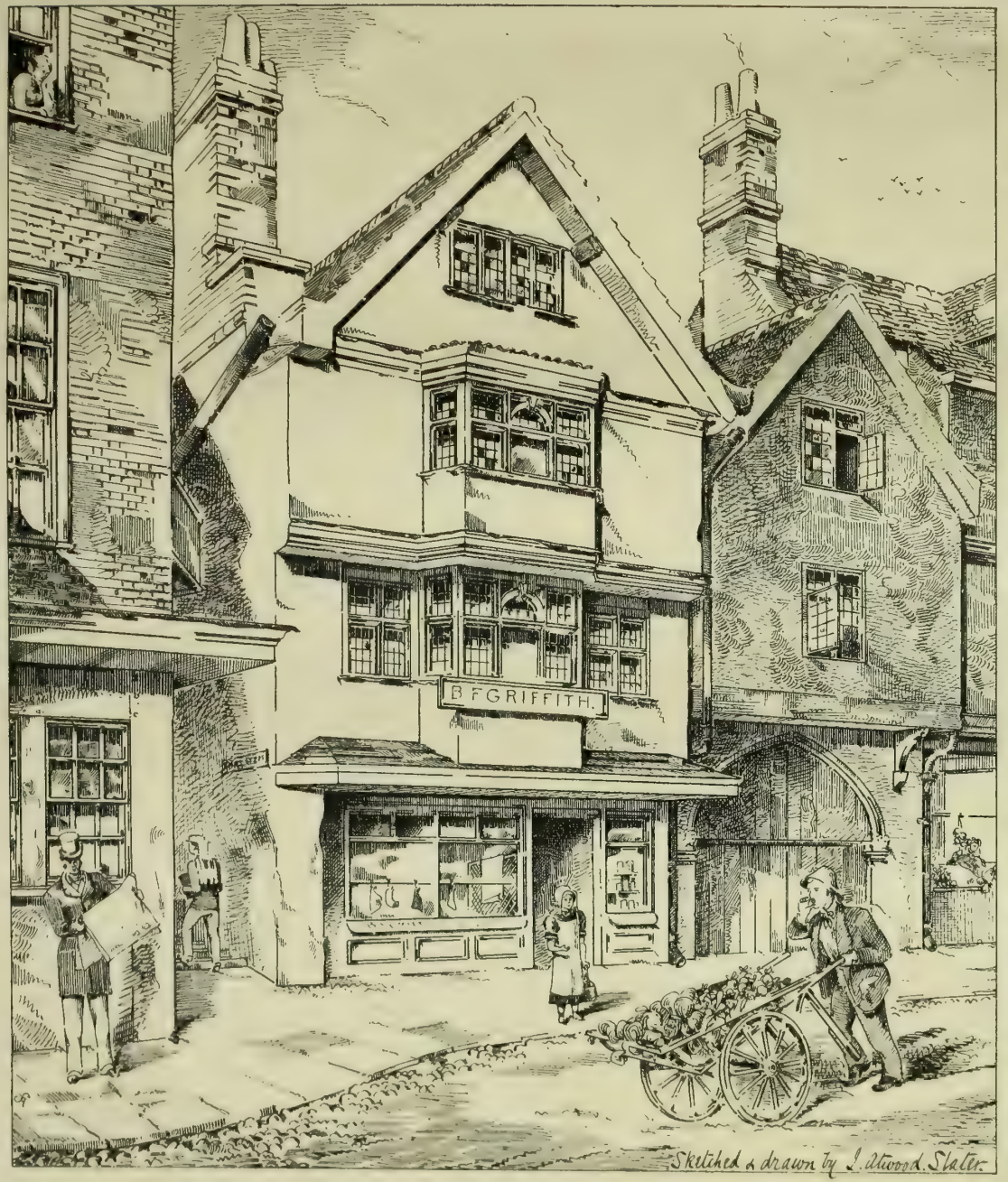
NORTH ELEVATION

EAST ELEVATION.

SCALE OF FEET.

LONGITUDINAL SECTION

T.C YATES.



Old houses in Christmas St Bristol

OLD HOUSE St Peters Church Yard DERBY

PONTEFRACT AND ITS TOWN-HALL.

[FROM A CORRESPONDENT.]

THE Corporation of Pontefract for the last four or five years have had almost continual discussion at the periodical meetings with respect to the insufficiency of the town-hall for present requirements, especially for concerts, balls, and public meetings—the principal hall (and the largest in the town) only being capable of accommodating about 450 persons. A few months ago the council so far promulgated their desires as to order advertisements to be inserted in this and other papers for competitive designs for additions only to the old building, and, in answer to the invitation, no less than 59 sets of plans were submitted from all parts of the Kingdom. After a meeting or two a hard-and-fast bargain was made with Mr. Corson, of Leeds, "to assist" in selecting the most suitable design compatible with the stipulated amount, viz., £7,000, to include the architect's commission, and on the last day of the year his award reached the committee, giving, we understand, the first premium of £50 to the plan motto "Straight and True," and the second prize of £25 to motto "1880"—the names of the architects, of course, not yet discovered, and there were two designs sent in with the motto "1880." The corporation on Thursday evening held a special meeting on the subject, and also to take into consideration a requisition signed by eight members of their body "to rescind all resolutions that had ever been passed by the council with reference to the new town-hall, which recognised the indispensable condition that the present hall shall not be pulled down or interfered with, and to pass a resolution that the new town-hall be built upon the site of the present hall and such other properties as may be necessary." An ex-mayor supported a motion in favour of the requisition, arguing that no alteration to the old building would be satisfactory if not pulled down, the ground cleared, and important street improvements carried out in the immediate neighbourhood. He would support such a scheme or would let the whole thing drop till such times the ratepayers could better afford to spend the money. Another member, in opposing the resolution, reverted to the last five years they had had the subject under discussion, and said if the motion was carried it would take another five years to talk the town-hall back, to say nothing of being the laughingstock of the whole of the West Riding of Yorkshire; he further argued that the sum of £6,000 would erect a very creditable building suitable for all purposes required, and if they pulled the old hall down and made some street improvements, the building alone would cost £25,000, and he knew that the gentlemen who signed the requisition were divided, some not wanting any money laid out at all, whilst others would be prepared to support an enlarged scheme of entire new building and street improvements. Seven gentlemen composed the original committee, and in their report they had recommended eight schemes and sites for consideration, one gentleman adopting two! Mr. Corson, of Leeds, had previously given them the cost and report upon these eight schemes. Another member showed that the corporation had already committed themselves to over £3,000, for the purchase of additional property adjoining the present hall, and were arranging for another property of £2,000 and that the building as proposed (even if, as the committee intended, they did a lot of chopping off the stone front and substituted brick with stone groins) would cost £11,000 or £12,000. The resolution abandoning the work was carried after a long and heated debate by 12 to 7. We should also state that nearly three years ago some of the principal inhabitants of the town and neighbourhood privately collected about £3,000 towards this building and have handed the amount to the corporation. As soon as the council had finished the first division, a motion was made that this money should be returned to the donors, but was negatived by 11 to 10 votes

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The *Pontefract and Castleford Express* of Saturday last says: "We really cannot say how many times the corporation of Pontefract have tried to overcome the many obstacles which they supposed stood in their way of accomplishing the erection of a new town-hall; but certain it is that a great number of resolutions and counter-resolutions have been passed with reference thereto, until at length the public are wearied with hearing of the unseemly bickerings and personalities continually indulged in whenever the scheme is brought before the council. Were this all, perhaps there would not be much cause for comment; but when, after two and a half years' consideration, the purchase of valuable property, the advertising for plans for the proposed building, the response of about seventy architects, the exhibition of these plans in the Vicarage, and the recommendation of one of them by an eminent architect, the whole scheme is finally rejected by a majority of twelve against nine, there is indeed cause for inquiry how and why all this has been brought about. The mere collapse of the scheme would be of small moment were it not for the loss of time and money involved, and for which the ratepayers will have to suffer; but it also tends to shake the public faith in the business capabilities of those who represent the interests of the town. The handsome sum of nearly £3,000 promised towards the proposed hall should have led to something very different from what has been constantly brought before the public, and, if there had been any difficulty as to the site and structure, the ratepayers should have been at first consulted, and the feeling of the borough ascertained as to the necessity or otherwise for a new hall. We believe it to be the general feeling of the ratepayers that it should be carried out thoroughly, and with a view to the improvement of the town, or not at all. Although the resolution to abandon the project was carried on Thursday evening, it is almost certain that those who wish to erect a hall on the site of the present one will make another attempt, and we have good reason for believing that it will meet with success. With regard to the resolutions not to proceed with the building, we are of opinion that it was not competent to put such a proposition at that meeting, but that, according to the rules of the corporation, a special meeting must be convened for the purpose before this can be legally done. The town clerk was not appealed to as to the validity of the resolution, or in all probability it would not have been passed. We hope that, should the scheme be again brought before the Council, minor differences will be sunk, that personal feeling will have no sway, that the general welfare of the town will be considered, and then we shall have no fear for the result."

DAMP WALLS.

FOR several weeks past a good deal of correspondence has taken place in your paper respecting dampness coming out on the surface of walls. None of the answers that have appeared are altogether satisfactory. I have had considerable practical experience in the matter, and have written down the result of long and careful investigations on an important estate of the causes and remedy, and I can confidently say, if the inclosed rules and suggestions are acted on, no one need be troubled with this nuisance.

The cause of water or dampness settling on the walls of rooms is easily explained and remedied. Many valuable engravings, water-colour drawings, furniture, and decorations are permanently spoiled by repeated saturations from condensed vapour; and often work is supposed to be badly done, or the furniture not well made, when affected by this cause, for it does not always exist to the extent of being visible on the surfaces of the room.

Substances which are very soluble in water often attract water from the atmosphere to such an extent as to form a solution; as, for instance, distemper: and some organic substances, such as wood, have the same property of attracting water. Water evaporates at all temperatures when in contact with atmospheric air or other gases, and the vapour thus formed has a density and tension determined by the temperature. This evaporation takes place only from the surface, and, to an extent proportionate to the volume, temperature, and dryness of the air, with which the water is in contact. In a confined space this evaporation ceases, when the air becomes saturated with water-vapour; in the open air it proceeds more rapidly in proportion to the extent of surface exposed, and when the air which has become saturated with vapour is constantly replaced by fresh air. Consequently, a current of fresh air favours evaporation.

To obtain a current of fresh air in a room where cold air has collected, and to prevent condensation, a fire should be lighted, which will gradually draw off the cold air, and at the same time dry a small portion of the air, which rises to the ceiling, forcing the denser air down; when a sufficient time has elapsed for the room to become thoroughly warm, the gas may be lighted. Water is formed whenever hydrogen gas, or a combustible substance containing hydrogen, is burnt in oxygen or atmospheric air. If the gas is lighted before the room is warmed, the vapour formed by the gas is condensed by coming in contact with the cold walls. If the walls are papered, a great amount of condensation is absorbed; if they are distempered with any colour containing blue or dark green, they become quite black, but if the walls are painted none of the moisture is absorbed, and the water collects on the surface in beads which eventually run into each other and stream down the walls. Water is a very efficient solvent, so much so that there are a very few substances, solid, liquid, or gaseous, which are not to some extent capable of being dissolved by it. Many substances, however, can be dissolved by water only in such minute proportions, that for most purposes they may be regarded as practically insoluble; among which are oil-paints, but if earthen pigments are mixed with them as ochres, siennas, &c., they are easily affected by repeated saturations unless well protected by varnish. Walls painted with a large admixture of these colours soon become discoloured by dampness. Some are readily soluble, and require only small proportions of water, others but sparingly soluble; generally the solubility of any particular substance is increased as the temperature is raised. In the case of distempered walls a very slight rise in the temperature is sufficient to cause the water to penetrate the gelatine or size with which it is composed, and which the water has the property of abstracting, leaving a soft loose powder which comes off with the slightest touch.

If a fire is undesirable, as in rooms used only at night or for a short time, the gas should be lighted some time before the room is wanted, and the top sash of the window drawn down a few inches to enable the vapour formed by the gas to be carried off by the heated air. Even if there is a ventilator in the centre of the ceiling it will be necessary to lower the sash, the moisture forming very rapidly on first lighting the gas; after a time the window may be closed.

A good ventilator "as suggested by Dr. Hinks Bird" may be made in any room, with the expenditure of a few shillings, by placing a piece of wood three or four inches deep at the bottom of the window-frame between the beads. The bottom sash may then be raised, and a space is formed at the meeting rails of the two sashes, allowing the fresh air to curve in the direction of the ceiling. I have several times seen this simple ventilator working very successfully.

A. GREYSMITH.

ANNEXE TO THE CHARING CROSS HOTEL.

A CONSIDERABLE addition has been recently made to the Charing Cross Hotel, in the shape of an independent annexe, forming a large and lofty block of building between Buckingham and Villiers-streets. The new building covers an area of nearly 7,000 square feet, and is connected to the main hotel by a light iron bridge crossing Villiers-street. It contains about 130 apartments, these being chiefly approached by corridors. We wish more particularly to draw attention to a few special features in the construction of the building, and particularly to the flat roof and floors which we have inspected. These are constructed on the excellent fire-proof principle of rolled iron joists and concrete known as Dawnay's system. The roof, between six and seven hundred square feet in area, is covered with asphalte ¾in. thick, laid by Claridge's Patent Asphalte Company, and is a most perfect piece of work of the kind. The rolled joists about 3in. × 1½in. are supported on iron girders or binders 7ft. apart, and these carry the bed of concrete, upon which is laid the asphalte in the usual widths. A good fall is obtained on each side of the roof to the parapets, and the flashing round these is formed of slabs of Claridge's asphalte, placed upright under a projecting coping of stone. Against the chimney

stacks, which rise through the roof, a similar asphalte flashing is introduced, bedded beneath a projecting course of brickwork so as to form a drip. Nothing can be more secure than this kind of flashing, which has a far neater and more architectural finish than lead, forming, as it does, a sort of skirting. The asphalte, as applied to these skirtings, and some work at about an angle of 45° over the stair bulkheads, presents a very neat appearance, and bears evidence of careful execution, which no other than skilled labour of the highest class could have produced. The flat roof thus covered will form a promenade for smokers in summer time, and the view commanded, the building being six stories high, is extensive. The staircase is worthy of remark as an application of Portland cement concrete; the steps are cast in moulds, and their soffits thus treated produce an effective appearance below. The treads are covered with slabs of Portland stone, and the risers have red tiles.

The elevations are plain and unpretentious in style; yellow brickwork, with Portland cement dressings, are the principal materials used, except in the ground story where Portland stone is substituted. The works have been carried out from the designs and under the direction of Mr. John Fish; the contractors are Messrs. Lucas Brothers, and the foreman Mr. George Baker. The estimated cost is about £40,000.

EXPERIMENTS ON VENTILATION AT THE CUSTOM-HOUSE.

LAST week we referred to the system of ventilation, known as that of Messrs. Boyle, which has been applied to the Long Room of the Custom House, and we then remarked upon the decided success of the system as far as we had opportunity of examining the action. Since then a series of experiments have been conducted to test the efficiency of the system, extending from the 5th to the 9th instant, in the presence of several eminent scientists, among whom were Dr. B. W. Richardson, Capt. Douglas Galton, C.B., F.R.S., Professor Corfield, Sir J. B. Monckton, Rogers Field, C.E., Baily Denton, C.E., A. Murray (City architect's office), Ernest Turner, and some others. The room, we may add, is 194ft. long by 64ft. wide, and 54ft. high, and is lighted by 200 large Argand burners, fixed at about the level of the head. When the gas was lighted the heat and sulphurous vapour was unbearable to the occupants. The heating apparatus consisted of two large double open-stove fires in the centre of the room, and the number of clerks employed is about 140. We have only to add to our description last week the results of the experiments made in the iron shafts leading from the ceiling to air-pump ventilators on the roof, there being six of these, each of 3ft. diameter. For admission of air, twelve vertical tubes, each 10in. by 8in., in the window bays of the south side, have been fixed, the outer air-openings being in the centre of each bay below the windows. On Wednesday the air-pump ventilators were tested, and were found to be extracting at the rate of 800 cubic feet per minute, or a total, for the six ventilators, of 4,800 cubic feet. The wind was N.E.E., putting the ventilators to a severe test, as the inlets are on the south side. On Thursday morning the ventilators were extracting 900 cubic feet per minute each, or 5,460 cubic feet altogether. Dr. Richardson tested them at 4.45 on the same day, the total extraction for the six being 8,085 cubic feet with wind in the same quarter. Professor Corfield and Mr. Rogers Field on Friday conducted similar experiments, the velocity of the outgoing air being 612½ cubic feet per minute, or a total of 3,675ft.; wind, N.E., fluctuating; average speed being 525ft. On Saturday the experiments showed an extraction of 595ft., or a total of 3,570ft., the wind being N.

Mr. E. Turner's experiment of closing the inlets was a severe test to the power of the ventilators. Even under these unfavourable conditions with fires burning in the room, drawing air towards them, a difference of only 25ft. per minute in each ventilator was found. The inside temperature recorded was 60°, and the outer 40°. On Monday also, when a foggy atmosphere prevailed, the ventilators acted freely, and the long room was quite clear of the fog—a condition of things which contrasts favourably with former experiences. Those present at the experiments were highly satisfied with the results obtained under such trying conditions of wind and weather. We understand that Messrs. Boyle and Son are about to ventilate the Council Chamber of the Guildhall. The works at the Custom House were carried out under the superintendence of Mr. R. McLeish, clerk of works of Her Majesty's Office of Works.

WEST LONDON SCHOOL OF ART.

THE large room of the new building in Titchfield-street, W., recently built from the designs of Mr. R. W. Edis, F.S.A., for the use of this school of art, was crowded on Wednesday evening, on the occasion of the annual meeting for presentation of prizes. Mr. J. Comyns Carr presided. The report, read by the recently-appointed head-master, Mr. John S. Rawle, F.S.A., late of Nottingham, showed that notwithstanding the great disadvantages of a change of masters and removal of the school during rebuilding, the school had maintained its high position. It was now the largest of the ten metropolitan schools, and had last session 580 students—198 morning, and 372 evening; while the total number in London schools was 2,650. The fees and subscriptions both showed a substantial increase, and the successes at South Kensington examinations had been greater than previously—the gratifying results of the work of his predecessor, Mr. George A. Stewart. Mr. Richatson, one of the senior students, then presented to Mr. Stewart, on behalf of the assistant masters and pupils, a handsome clock and a purse of sovereigns, as an expression of the esteem and regard for one who during the twelve years he had held office, had shown himself a most excellent and successful instructor, and a sincere friend to the students. The chairman added an expression of sympathy and regret that Mr. Stewart should have been compelled to resign on account of the greatest affliction that could come upon an artist, threatened failure of sight. Mr. Stewart having replied, the treasurer's report was read by Mr. W. Graham, and was of a satisfactory character. He urged the students to submit all their work for examination; had they done so last year, the school would probably have earned an increase of from £60 to £70 in the Department's grant. However, the school had taken in prizes about one-fourth of the total awards made to the Metropolitan schools.

Mr. Comyns Carr then delivered an eloquent address to the students. As he was not a practical artist, but only one who had thought and written on art, he felt, he said, some hesitation in addressing them, but he should confine himself to general principles, and not venture to deal with technical principles. Nor, indeed, was there any need for him to dogmatise on practical matters, for they had evidence in the prizes before them that their instructions had been well done, and their new master came with excellent testimony from his predecessor that this would be continued. There was a danger, moreover, that technical education should degenerate into mere handicraft, and they needed to conbine with cunning of hand, mental labour of high quality, or it became useless. He, therefore, felt it not unbecoming in a mere writer on art to address them, the more readily because all writers on art at times, and some always, had much to answer for, for having enunciated platitudes. First of these misleading platitudes he should endeavour to controvert he would place the dangerous theory that it was necessary for students of the 19th century to make a new departure in art, so that they could only be successful in so far as they were "original." This originality was the pet vulgarity of the age. No such originality was possible to art. The greatest men in all ages had been those who had had most reverence for the past, and had studied its work most carefully, and they had always acknowledged their indebtedness to those who had preceded them. Art in itself was not new; it was in its essence as old as the world. There was another danger more subtle in nature than the first, because occasioned by persons of higher authority. Students were constantly urged to do something in sympathy with their own age. It was too soon for us to dogmatise on what the spirit of the age was; only those who came afterwards, and could look back dispassiontely on the whole course of the age, could justly define its special character; but he believed that in proportion as they were imbued with a respect and reverence for the best work of the past, so would they most truly be *en rapport* with the spirit of the age. Compared with Italy, we were almost children in art; we had had a great race of painters in the immediate past, as there had been a greater race of architects in a still further past, and what had been could be. There was apparent what promised to be the beginning of an English school of art, but what its characteristic product would be could not be ascertained by analysis; it would reveal itself in after-time as the result of our earnest labour and thought, brought about by slow training, by long study, by generations of successful masters who worked each on the foundations laid by their predecessors. They ought not, therefore, because they could not predict what local form an art would take, to be discouraged or disappointed; nor because we admired and copied the great works of the past. The old Italian masters were confined to a limited range of subjects; they restricted themselves to sacred subjects, and, as a consequence of concentrated thought became filled with the spirit and feeling of their work. In conclusion, the chairman referred to the proposed travelling studentship. In visiting Italy and looking at the great masterpieces of the past, the selected student would, he trusted, bear in mind what he had tried to impress on them that evening; the travelling student would not then be ashamed of our own works, and still less would he return to do differently from the past, but would strive to build upon what he had learned and studied.

Mr. J. D. Crace then distributed the prizes, which included a national silver medal awarded to Henry Tidhurst, two large medal awards to Miss Kezia Hytche and Miss Helena Jones, and a national book prize to George E. Tucker. In the third-grade local examinations four Queen's prizes were taken, and 11 "successes" were notified. Besides these there were 16 third-grade prize awards, two free studentships, and 63 second-grade prizes, and several local prizes were also given. Mr. Crace announced that the terms of the proposed travelling studentship had been decided upon that afternoon. A gentleman had placed £120 in the hands of the Painters' Company to be expended for encouraging the art of painted decoration. The Company had intrusted the committee of the West London School of Art with the task of devising a scheme, and they proposed to institute a travelling studentship as an experiment, spreading the money over three years. This would enable the student selected by competition to spend two months on the Continent, and the committee resolved that should the student elect to spend the time in Italy, to add £10 from other sources. To this the Painters' Co. and the original donor had agreed, the latter at once promising to raise the studentship from £40 to £50 should the student decide to visit Italy.

Mr. Rawle, in acknowledging, for Mr. Stewart and himself, a vote of thanks to the past and present masters, expressed his gratification at the generous offer which had been made by Mr. George Mence Smith, and urged the students engaged in decorative art to show their appreciation of this, the only prize of the kind in the kingdom, by earnest work. The winner of the travelling studentship would have exceptional opportunities for improvement and for the refinement of his artistic tastes. If he fairly used his opportunities while in Italy, and kept his eyes and heart open to the glorious influences surrounding him, he would return with a mind refreshed and invigorated, and filled with all-absorbing thoughts regarding the nobility of his art. In this foggy clime they could value but faintly the artistic glories of Italy. That country was a treasure-house of untold wealth to the painter, the sculptor, and the decorative artist. He could testify that it was not till he had been there and had tasted at the fountain-head that he knew that kindling of enthusiasm only to be felt when in the presence of art in all her majesty and glory. Addressing the students, he said all experienced in tuition found students were pretty much alike in character everywhere. By far the great majority were earnest and hard workers; but this subject of congratulation was mingled with regret that as a body students did not think sufficiently. Too much was left to the hand to accomplish, too little directing work was undertaken by the brain. This want of thought was apt to make the student fail in realising the artistic nicety of

his labour. He contemplated it in detail, and the result was a mass of little prettinesses in which the several lights and shades were represented without consideration of the work as a whole, and with an absence of the balance of quantities. The whole heart and mind should be thrown into the restoration of the work set before them as a whole, for all true art work was based upon knowledge, and this could only be acquired by close observation and reasoning upon it.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The third meeting of the session was held last Wednesday, Mr. Thos. Morgan, F.S.A., in the chair. Mr. G. R. Wright, F.S.A., exhibited an early silver denarius, with the name of the 18th Legion, found at Cirencester; and detailed the progress of excavations at the Roman villa at Bromham. Mr. Walford rendered some notes on De Lonne's "Description of London," 1681 and 1690, a scarce book, about to be reprinted. Mr. Lewis produced the fragments of what has been an elegantly-worked coffer of ivory, of 12th or 13th century date, recently found in Telegraph-street. Mr. De Gray Birch, F.R.S.L., described a vase brought from the Egyptian tombs of Gizeh by the Rev. Greville Chester; and also a cast of a copper plate for measuring the tonsure of ecclesiastics of St. Paul's Cathedral. It is hollowed and circular, with the figure of a griffin, and appears to have been reduced in size. Mr. Fryer, F.C.S., reported some discoveries on the site of St. Aidan's Church at Old Melrose. Mr. Loftus Brock, F.S.A., produced a plan, and described the remains now being excavated on the site of old Leadenhall Market. Two long walls, of the 15th century building, are visible, with a series of corbels. A Roman pavement, of ordinary brick tesseræ, has been found over a large part of the surface, and covered with the ashes of some great fire. Above this is concrete of a second floor, while below, the remains of walls, 5ft. thick, have been found, indicating a building of importance. These walls have bands of Roman brick, and one is constructed entirely of that material, pointing to an early period of the Roman occupation. Mr. Grover, F.S.A., referred to the constant finding of traces of a great conflagration in London, which he considered was from the burning of London by Boadicea. The first paper was by Dr. Wake Smart, on "Roman Remains found at Nursling, Hants," which was, in the absence of the author, read from the chair. The remains point to the existence here of an important Roman station, not yet identified, and its position on a line of road from Bitterne was indicated. A large amount of Samian and black ware have been found. The second paper was by Mr. G. R. Wright, on "The Hardship of the present Law of Treasure Trove." After referring to the reason of the law in former days—namely, to help the king and to assist the revenue, with the punishment of death for evasion, the lecturer passed on to these altered times, when its operation caused either the loss of art treasures by their being broken up by the finders for concealment, or the stoppage of works of research. He instanced the case of the Saxon cemetery at Longbridge, which was in course of excavation by the owner, when certain articles of value found were claimed by the Treasury. A discussion ensued, in which Messrs. Compton, Birch, and others took part.

COMPETITIONS.

GLASGOW.—Last week, at the meeting of the Glasgow Town Council, the Committee of the New Municipal Buildings presented the following opinion:—1. That none of the designs which can be executed for £150,000, with 10 per cent. added to cover contingencies, are such as the committee can recommend the Magistrates and Council to accept. 2. That, as the cost of the designs invited under the conditions of competition was limited to £150,000, the committee are of opinion that it would not be expedient to accept any design lodged in that competition, the cost of which would considerably exceed £150,000. 3. That the Magistrates and Council should remit to this committee to prepare new conditions of competition, with a view to the obtaining of new designs. 4. That the plans prepared by Mr. Carrick should be reconsidered by the committee, and as adjusted should be submitted to competitors simply as indicating the accommodation required. 5. That the cost of the building for which the new designs are invited should be increased to about £250,000. It was also thought by them desirable that the new competition should be open. On the conclusion of a protracted discussion, it was agreed, on the motion of Councillor Jackson, to adopt the recommendations, except in so far as they dealt with the cost of the buildings, and the open nature of the competition.

NEWBURY GRAMMAR-SCHOOL COMPETITION.—We are informed that 52 sets of plans and drawings for the New Grammar-School have been sent in, and that the trustees of the municipal charities intend, so soon as Mr. Waterhouse has advised them as to the comparative merits of the plans, to exhibit them in the Town-hall. According to present arrangements, the exhibition may be expected to take place from Monday, the 31st of January, to Wednesday, the 2nd of February.

PONTEFRACT.—Since the determination arrived at by the town council on Thursday night last, to abandon the new Town-hall scheme, about which more will be found in another column, several applications have been sent in from gentlemen asking that their subscriptions should be returned. The town council had nearly £3,000 promised and already subscribed for the new hall, so that if the new building is not ultimately erected, this will be a direct loss to the ratepayers. The latter are generally opposed to the scheme falling through, and a public meeting is contemplated to protest against the action of the town council. The subject, however, is to be again brought forward at a special meeting of the Council.

SCHOOLS OF ART.

TAUNTON.—The annual meeting for distribution of prizes was held on Monday. The financial report showed that the fees had largely fallen off, and also the honorary subscriptions, and that there was now a debt of £60 on the school. The report of Mr. Rowe, head-master, stated that 67 students had attended the school, being a decrease of 24. There had been one Queen's prize, and 3 book-prizes, against nine last year; and 15 second-grade prizes and certificates against 25. Commenting on the fact that many students engaged in mechanical trades openly declared their dislike to the study of practical geometry, Mr. Rowe said nothing but crass ignorance would account for this.

PARLIAMENTARY NOTES.

DUES ON ROUGH TIMBER.—Mr. Broadhurst on Tuesday asked the Chief Secretary to the Lord-Lieutenant of Ireland whether his attention had been directed to the heavy dues imposed on rough timber entering the port of Dublin, and to the hindrances those dues were to the Dublin trades; and, if so, whether the Government were prepared to adopt measures with a view to the abolition of the said dues. Mr. W. E. Forster said that no representation had been made to the Government on the subject, and that there was no power on their part to interfere in the matter.

ACCOUNTS OF SURVEYORS OF HIGHWAYS.—Mr. Stanhope, on Tuesday, asked the President of the Local Government Board whether he intended to take any steps to amend the inconvenient forms of accounts at present required to be filled up by the surveyors of highways in country districts. Mr. Dodson: In framing these accounts the Board endeavoured to do so in as simple a form as possible consistently with the requirements of the Highway Acts, which are very minute, and were previously much disregarded. The forms had to be adapted to large as well as small parishes, and careful provision had to be made for separating the expenditure on main roads from that on ordinary highways for the protection of the county authorities. The auditors have now had nearly a year's experience of the working of the new forms, and the Board are now in communication with some of them in the hope of being able to dispense with some of the forms.

An Improved Dwellings Company has been formed at Stroud, Gloucestershire, under the Limited Liability Act; the capital is £5,000 in £1 shares, and the object is to improve the dwellings of the labouring classes in the borough of Stroud, by purchasing and improving existing cottages and by erecting new ones.

Building Intelligence.

NORTHAMPTON.—The workmen engaged on the extension of the convent of Our Lady, Abington-street, Northampton, were entertained the other day. The architect of the building is Mr. William Hull, of St. Giles's-street, Northampton, and the contractor Mr. Richard Dunkley. The new portion really forms the west wing of a quadrangle, the south side of which has a front elevation towards Abington-street. On the north-east side, with the gabled front towards the quadrangular court, stands the chapel, but in an elevated position. It will be approached by a flight of steps leading up from the court below, the principal entrance being through a narthex in the centre. Within the apse will be placed the high altar, which is to be of sculptured marble, while the floor of the sanctuary will be inlaid with mosaic tiles. On the south-west side will be a small chapel, and on the other side there are convenient sacristies for the officiating priests. The building is nearly ready to receive the roof, which will be an open-timbered one, the wood used being the best pitch-pine. Internally, the walls will be cemented, but the stonework will be shown through. White Mansfield and Bath stone have been used on the exterior, and harmonise well with the white bricks of the Whitwick Colliery Company.

PLYMOUTH.—The first stone of a block of artisans' dwellings was laid on Tuesday week by the Vicar of St. Andrew's Church in this town. The site in St. Andrew's street has been cleared by the corporation, and was sold by them on the condition that only labourers' dwellings, in accordance with stringent conditions, should be built. Mr. John Pethick is the builder, and the property now belongs to Sir E. Bates, ex-member for the borough. Red brick is to be used for the walls and grey bricks for dressings, and the plinth will be of limestone masonry; the roofing is to be of purple slates. There will be two blocks, each containing twelve distinct and self-contained lettings of a living room 12ft. square, bedrooms 11ft. by 9ft., a pantry, and coal-bunk. The height of rooms will be 10ft. clear on ground-floor, and 9ft. 6in. above. On each floor will be a wash-house and separate closets for each sex. American cooking-ranges will be provided in the living-rooms, and the ventilation is by one of Jennings' contrivances. The rents are to be from 1s. to 1s. 2d., and it is said will return 5 per cent. on the outlay. Messrs. Hine and Odgers are the architects. Two other blocks of artisans' dwellings will be erected by the same architects and builder in Haliwell-street, Plymouth, and will be four stories high, built in red brick with grey courses and dressings, and will be let at 15d. per week.

RICHMOND.—The committee of the new club at Richmond, the Wilderness, entertained a number of gentlemen connected with the Press at luncheon, on the 29th ult., preparatory to the opening of the club. The name "Wilderness" is that by which the property has long been historically known. It belonged for years to the Devonshire family, and it was here that the beautiful Duchess, the subject of Gainsborough's celebrated portrait, passed several years of her life. More recently the house was given to the Hon. Mrs. Lamb, and in the alterations made for the club accommodation, the foundation-stone, laid by her in 1833, was unearthed, and will form the corner-stone for the proposed new ladies' entrance to the club. The lawn tennis and pleasure grounds, which will not be complete until next spring, have been tastefully laid out under the superintendence of Mr. J. F. Johnson, the eminent landscape gardener, known in connection with the Crystal and Alexandra Palaces flower-shows. The Wilderness has been most handsomely furnished throughout by Messrs. W. Walker and Sons, of Bunhill-row.

SALTAIRE.—New Wesleyan Sunday-schools at Saltaire were opened on the 1st inst. The building, which is erected on a piece of ground in the rear of the chapel, is in the Italian style, and was designed by Mr. H. Isitt, of Bradford, upon the American plan, similar to the Sunday-schools of the Congregationalists at Saltaire. The schools consist of a large central hall, with galleries on three sides. Leading from these and from the hall below are 20 class-rooms, capable of accom-

modating 650 scholars, and the central hall will also hold a large number. The size of the hall is 48ft. by 37ft. 6in. Near the entrance is the library, and on the same side are lavatories and other conveniences. The cost of the building and furniture has been £2,200.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

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FORGETFUL. (Stoke's system is said to a good one.)—DRAUGHTSMAN. (In neither case can the photograph be a good one. No washes must be used, either by design or accident.)—B AND H. (Thanks for congratulations.)—W. H. R. (They were not your initials. Not received.)

"BUILDING NEWS" DESIGNING CLUB.

LIST OF SUBJECTS.

A. A row of three shops for a village, on a corner site, the angle house to be arranged as a small inn. Height of ground floor, 12ft., and two floors above, one of which may be obtained partly in roof. Plans, elevations, sections to be one-eighth of an inch to the foot. Sketch perspective.

B. A sedilia with three seats, and canopy over, in oak. Plan, elevation, and sketch. Scale, 1½in. to the foot.

DRAWINGS RECEIVED.—En Avant, Clarior e Tenebris, Frank Weaver, Sub Judice, Juvenis, Ambition, Ralph, B. J., Nil Desperandum No. 2, Nemo in Shield, Snowflake, Curion, Beta, Arnold, Motto A.

A. L. HUSBAND. (We have noted address.)—BETA AND OTHERS. (If the name and address had been written on the back of drawing it would not have miscarried, and we must again repeat our request that this will be attended to. Non-compliance with it occasions us a deal of trouble.)—NIL DESPERANDUM.

SEWERS AND MANHOLES. (In reply to several correspondents, the sheets of detail drawings of pipe sewers and manholes on steep gradients referred to by us last week, issued by Mr. Rawlinson, C.B., may be obtained of any of the following:—Knight and Co., 90, Fleet-street; Harrison and Sons, 59, Pall-mall; Edward Stanford, 55, Charing-cross; W. H. Allen and Co., 13, Waterloo-place; Shaw and Son, Fetter-lane; Waterlow and Sons, Great Winchester-street. The price of the sheet is 2s.)

Correspondence.

GLASGOW MUNICIPAL BUILDINGS COMPETITION.

To the Editor of the BUILDING NEWS.

SIR,—"T. L. W." may rest assured that I do not covet the twelfth juryman's place, and if he will consider that the most of the 90 are disqualified on indisputable grounds, apart from the one now under notice, he will see that I do not take it in fact.

As to blackening windows, he must bear with me when I remind him that his assertion, though repeated very earnestly, cannot, upon such a question, be regarded as a proof. I have no doubt he means to be correct; but, on the other hand, I am quite satisfied that an elevation having its windows blacked in, is, to that extent, not "in line," though all the rest may be. If one wash with the brush is "in line," so is another; and those who put only a *dark* Indian ink tint on their windows are also right, and a flat Indian ink tint (no colour) on the wall may be used, and then a darker one on nearer parts, and so on. I read the words, "in geometrical form only, in line," and understand that any kind of wash with a brush is inadmissible, for the two things are a contradiction in terms. Therefore, I wrote no inquiry about the "intention," because I found "no room for doubt as to the meaning of the expression," and the intention was equally clear. It is true the words "in line *only*" are not used, but "form only, in line" are, and anything not "in line" is excluded because it is not "in line," which the instruction demands it should be.

If, however, "T. L. W." should contend that work done with a brush is "in line," I think you, Mr. Editor, will be quite justified in intimating that this correspondence may now cease, without reply from me.—I am, &c.,

ANOTHER COMPETITOR.

LIVERPOOL CONSERVATIVE CLUB COMPETITION.

SIR,—Learning that the plans for which the 2nd and 3rd premiums had been paid, had been sent to, and retained, at the offices of the architects to whom the first place had been awarded, I felt it my duty to protest against such an unusual course, and now inclose copy for publication with this, leaving comment to others, and merely saying that although I have waited since the date therein, no reply or even acknowledgment of receipt is to hand, notwithstanding my membership of the club, and position as a competitor.—I am, &c., C. O. ELLISON.

TO THE COMMITTEE OF THE CONSERVATIVE CLUB.

GENTLEMEN,—In June last your building committee wrote me as to sending in plans for our new premises, and I agreed to do so upon the conditions issued, which provided for *award* of premiums *only* by a referee, the "committee of the club reserving specially to themselves the right to make their own selection of the design to be carried out."

At considerable outlay of time and money I visited 18 to 20 of the principal clubs in the kingdom, going with their experienced managers into all the important details of their arrangements, especially having proved defects pointed out, so as to avoid them in our new club. I then prepared plans, submitting them to four of the most practical of the Metropolitan club managers, who pronounced them more complete than any existing club, alike for comfort of members and economy of working, whilst the great economy in first-cost is seen from the fact that my said plans gave all your requirements with no less than 65,000 cubic feet less building than the plans which have been accepted—the heights of the principal rooms being the same.

The referee having done his part, awarded the premiums, and admitted that the unusual merit of the drawings made the "task a peculiarly difficult and onerous one," I wrote you (prior to your making the selection of the designs to be carried out, as per terms of competition) most respectfully asking that, in face of the above difficulty, the authors of three premiated designs be "each permitted to point out the specialities of his own plan, and further compare same with others, leaving the committee sole judge as to the points so brought out, by which means each competitor would be placed on the same level of advantage; all the special features of each plan would be pointed out by those who had spent many weeks in special study of club arrangements, information which must be of the utmost importance or value to gentlemen having the final selection of plans to make," a request which, with all its manifest fairness to the competitors and advantages to our club, was, I regret to say, refused.

According to the terms of competition, the sum of £125 was paid by way of premium *only* to the authors of the plans placed respectively 2nd and 3rd in the order of merit, the said plans being "considered the property of the committee"; but that this could only mean for custody or reference, and without any right whatever of use or execution, must be plain from the fact that the conditions being drawn up by so eminent an architect as the referee (Mr. Waterhouse), he would not be likely to give to any committee two full sets of drawings with right to use and execute them for a mere premium, the amount of which would not even cover the actual money cost of their production.

Further, if the right of your committee in this matter is to be taken as absolute, then it would empower you, by the mere payment of three premiums, together amounting to £225, to take the three best sets of drawings sent in (worth several times this amount on the ordinary terms of my profession), set aside their authors, and employ anyone else who liked to carry out their plans without any further compensation, an injustice so glaring as at once to show that this could never have been the intention either of those who made or those who worked to the conditions.

As to the selection made, I offer no opinion whatever; but it having come to my knowledge that, notwithstanding the fact of no meeting of the executive committee of the club having yet had the plans under consideration, for making the selection specially reserved thereto, the 2nd and 3rd prize drawings have been sent to and retained at the offices of the architects selected by the building committee, presumably for them or those about them to make such use of as they may think fit. I, as the author of the second prize plans, enter a most emphatic but respectful protest lest such an unusual treatment of competitive drawings should become a precedent by its adoption in so important a competition as the Liverpool Conservative Club. By all means let the chosen plans be carried out and their authors have the credit and profit which is their due; but I put it to you as business men, Is it right, or in any sense reasonable, because you have paid mere premium in acknowledgement of the skill displayed in the drawings placed second and third in point of merit, that you should make use thereof to the advantage of our club, and that at a price which does not cover cash out of pocket by their authors, and cause even the credit thereof to be given to others?

In sending this protest, I wish to be understood as animated by no want of respect to any member or members of the committee, or desirous of interfering in any way with the execution of the plans as sent in competition by Messrs. Holmes, but solely with a view of preventing a precedent being formed such as could but prove eminently detrimental to the best interests of the profession to which I have the honour to belong.

Your obedient servant,
C. O. ELLISON.

SHEFFIELD FONT COMPETITION.

SIR,—As you are aware, designs were invited for a new font which was to be erected in Sheffield Parish Church, these designs were to be lodged with the Secretary by 1st September last. In response to that invitation I sent in design which was duly returned, carriage paid, about two months afterwards, without so much as a note to indicate the names of the successful competitors. Have all the competitors been treated thus? I have waited patiently to see if your columns would make the matter clearer, but I have waited in vain.

Is there no information forthcoming on the subject?—I am, &c., A LAST RESOURCE.

"A WONDERFUL STOVE."

SIR,—I have only just seen Mr. Burges' letter in your issue of 31 Dec. last, asking where I saw the Phœnix above alluded to.

It was in a house at Shepherd's-bush, whither I was taken by my friend, the inventor, Mr. Samuel Russell.

Since my letter of Nov. last, I have had many communications from manufacturers, asking for Mr. Russell's address, and I have forwarded to them the last given me by that gentleman, viz., Mr. Samuel Russell, 83, Macfarlane-road, Shepherd's-bush.—I am, &c.,

JOHN P. SEDDON.

1, Queen Anne's Gate, Westminster, Jan. 10.

FUTURE OF CEMENT.

SIR,—We have read with great interest the letters which have of late appeared in your publication regarding concrete. And as we have had some little experience in this class of work during the last fifteen years, and having within the last two done some 10,000 cubic yards, we thought we would give our quota for the benefit of those who care to take it.

We have always found that aggregates of the hardest, roughest, and cleanest description, along with a slow-setting cement of the highest quality, are necessary to make a concrete that will be durable and effective. In this matter we entirely agree with Mr. H. Reid.

We have also found that the least admixture of loam or other matter of a dirty or clayey nature tends to "kill" the concrete, and failure is the result. It is impossible to make good concrete, unless you have perfectly clean and hard materials. Our concrete works consist of laying down pavements, railway-platforms, warehouse, stable, basement, dairy, fireproof, and every other description of floors. As regards the manufacture of concrete work for heads, sills, cornices, &c., we have not made a

spécialité of it, but we have made work to many architectural designs, and can show in our office, if any one cares to call and see, concrete as hard as Spinkwell stone, and of a beautiful colour. This could not be obtained, except under the conditions above stated. Owing to the thinness of the work, of which we *do* make a spécialité, averaging from 3in. to 4in. thick, we are obliged to use the very best materials, and we have never had a single failure in the work we have done.

Some of our clients inform us that pavements laid by us several years ago, have as yet shown no perceptible signs of wearing.

By our system we can make a concrete as hard as granite, quite as durable, and far more pleasing in appearance.

We laid in Oxford-street and Cavendish-street, nearly six months ago, for the Marylebone Vestry Board, a pavement, which has not yet worn in the least, although the daily traffic to which it is subjected is enormous. It is every day increasing in strength.

And now, Sir, there is one point on which none of your correspondents on concrete have ever touched—*i.e.*, the advantages of concrete for street pavements in London and district.

Many thousands of yards of York flags and asphalte are laid yearly in the Metropolitan district, the cost of which must amount to a very large sum of money. Now by laying concrete instead, the district boards would make an enormous saving; the cost of concrete being much less per yard.

Again, in a sanitary point of view, it has its advantages. It is impervious to damp, and having no joints, moisture cannot percolate through it to the cellaring beneath. The gentleman in front of whose premises we laid the pavement in Oxford-street informs us, he has now, for the first time in twenty years, dry cellars.

We think, Sir, concrete for street pavements is one phase in the "future of cement" which ought to receive due consideration. By its use much money might be saved, and the pockets of the ratepayers and the community at large will be benefited.

Surely if the people in the northern counties of England, the places from whence the stone for paving is obtained, find it more advantageous to use concrete in preference to stone or asphalte, it must be more to the advantage to those in the south to use concrete.

We can say without fear of contradiction that those who once use concrete, and who have the work properly done, will never use anything else. For wherever stone, clinker, or asphalte is used for pavements of any description, there concrete can be substituted very much to the benefit of those who use it.—We are, Sir,

"EUREKA" CONCRETE COMPANY.

Queen's-buildings, 52, Queen Victoria-street.

Intercommunication.

QUESTIONS.

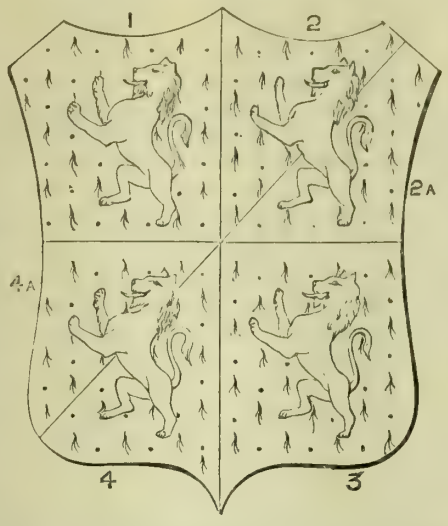
[6354.]—**Measuring Zincwork.**—If I order a 6ft. zinc elbow chimneypot, and it is charged at 1s. 4d. per foot, how many feet ought I to pay for? This is an ordinary pot, stock size, and used daily.—ZINC.

[6355.]—**Harmonic Proportions**—I am informed by a friend that several of the leading architects work or design to a rule of harmonic angles or proportions. From what I have read and seen in my time I presume this is not so. Perhaps some kind reader will enlighten me.—SAGAR.

[6356.]—**Cubing Workhouse.**—Will any of your numerous readers kindly tell me what would be a fair price to cube a new workhouse at to accommodate, say, from 300 to 400 persons, the building intended to be very plain, built of stone, the quarry being within three miles of the site? Should the master's house, hospital, &c., be cubed at a different price?—J. C. W.

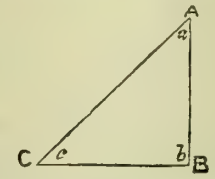
[6357.]—**Lining for Turkish Bath.**—Will some reader kindly tell me of the best lining for the walls and ceilings of the hot-room of a Turkish bath? The walls are old and well built, the surface next the rooms to be lined with white tiles to a height of 5ft. It is of great importance that the heat should not penetrate to the adjoining rooms.—SUBSCRIBER.

[6358.]—**Stone Shield—Cellar.**—I am about directing a carver to prepare a shield in stone, after the form of the pen and ink sketch herein, the original of which is painted in colours as described on the said sketch. Please say how the panels No 2, 2A, 4, 4A (I mean their grounds), should be prepared to show distinctly the quartering. Should they differ from No. 1 and No. 3? Kindly say how the ground in each panel should be prepared in stone, whether they should be tooled, or bolstered, or otherwise. The shield is panelled in the following colours:—Divisions 1, 2, 3, and 4A, black ermine on white ground: 2A, and 4, white ermine on black ground. I have also built a good house with excellent cellars, running north and south, and in forming these had to excavate into a rock some 2ft. 6in. or 3ft., which rock dips westward. The consequence is that after heavy rains the water floods the



cellar by running with formation of the rock, which dips from east to west. What would you recommend to prevent this flooding of water?—CONSTANT READER.

[6359.]—**Mathematical.**—Will some mathematician please give the produt of the following (taken from



Spon's tables), by giving value to the letters, say, AB = 15, BC = 9, CA = 12, and oblige. When three sides are given, to find the angles Cos. $a = \frac{AC^2 + AB^2 - BC^2}{2AC \times AB}$.—W. K.

[6360.]—**Brighton Clock-Tower Competition.**—In the BUILDING NEWS of January 7th I find that the Brighton Town Council have decided to have a competition for clock-tower, &c., but no size in any shape or form is given, only the amount it must cost. Can anyone give further information?—A SUPPORTER OF YOUR VALUABLE PAPER.

REPLIES.

[6345.]—**Surveyor's Charges.**—A customary charge is 2 to 2½ per cent. for quantities when tender is accepted, but the charge is sometimes as low as 1½ per cent. For simply making an estimate from quantities supplied, a fair charge would be be 1½ per cent., but it is usual to make an arrangement. "Quantity Surveyor" says he is often called on to take out quantities and make estimates for builders, taking no risk nor responsibility for accuracy. All that need be said is that if builders contract upon such conditions, they cannot fairly look to architects in case of loss. The system, on the face of it, is objectionable, for it stands to reason that if the surveyor is really the estimator for a building and is not responsible for accuracy, he would be inclined to underprice for the sake of winning the contract.—G. H. G.

[6346.]—**Landscape Gardening.**—A small work on the subject is published by Mr. Kemp, entitled, "How to Lay Out a Garden" (Longman and Co.), but Repton's work on Landscape Gardening is still the authority. The subject has been frequently attended to in the BUILDING NEWS.—G. H. G.

[6347.]—**Perspective Drawing.**—"H. K. A." had better get Nicholson's "Principles of Perspective." Burchett's Perspective is a modern and very good treatise for ordinary use.—G. H. G.

[6350.]—**Surveying.**—In our neighbourhood the outside of ditch (say, 3ft to 5ft. from quickset plant according to custom) would be the boundary line, but it does not necessarily follow that you can build out of that line.—DORSETSHIRE SURVEYOR.

The town council of Wolverhampton had before them on Monday the various accounts recommended for payment in connection with the streets' improvement scheme, including an item of £840, fees claimed by Sir H. A. Hunt, the official arbitrator. Great astonishment was expressed at the largeness of the charge, which was denounced as exorbitant; but several members discouraged the proposal to appeal to the Local Government Board as a useless addition to the expense, it being stated that though other towns had protested against the charges made by Sir H. Hunt, they had been compelled to pay in full. It was resolved to pay the account less the amount charged for arbitrator's fees, it being stated that Alderman Fowler, the member for the borough, would bring the claim before Parliament.

Our Office Table.

WE shall watch with some interest the progress of the Sanitary Protection Association, described elsewhere in a paper read by Prof. Fleeming Jenkin, F.R.S., before the Society of Arts on Wednesday. One great merit of Prof. Jenkin's programme is its simplicity and its freedom from fads. If the association is to have a permanent and useful existence, its officers must carefully avoid any partiality for sanitary patents, or the public will soon think them interested, and must in every case be thorough in the inspections they make, or their customers will soon come to regard their examinations with indifference. If these two points are kept steadily in view, the association may do much good. We are glad to see Mr. Cresswell's idea of granting a certificate to the house of its sanitary condition is to be embodied in the scheme.

THE Melbourne correspondent of the *British Mercantile Gazette*, noticing Messrs. Clark, Bunnett, and Co.'s exhibits at the Melbourne Exhibition, says their pavilion in the British Court covers an area of 2,250 superficial feet, and is about 16ft. high, the whole of which, except the carpeting and upholstery, is constructed of various patterns of shop-fronts, new designs of pilasters, columns, spandrels, and ornamented brass and ironwork generally; all of a most substantial and elegant workmanship. The pavilion is inclosed with the noiseless, self-coiling, revolving steel shutters of which the exhibitors are the sole patentees, manufacturers, and exhibitors. Some are of very delicate construction, and may be handled by a child of tender years, though they are effective against the ordinary operations of thieves; others are massive, and intended for banking-houses and buildings of a similar description, which require to be well protected from the assaults of the skilful burglar. The interior of the pavilion is also utilised to the best advantage. Samples of the various kinds of the manufactures of the company are displayed in profusion. These include many designs of shutters suited for shop-fronts, doorways, cupboards, hatchways of ships, and for a variety of other purposes. Also their new metallic Venetian blinds, which when folded occupy but very little space when compared with the old-fashioned window-blinds. The pavilion is utilised as an office by the representatives of the firm, and is regarded by all visitors as one of the most ornate within the building. Colonel Sir Herbert Sandford, Special Executive Commissioner for Her Majesty's Imperial Government, was delighted with its appearance.

AT a special meeting of the Birmingham town council, held on Tuesday, a report was presented by the General Purposes Committee upon the appointment of architects for corporation work, which recommended that the various committees should exercise their discretion in the matter in reference to buildings and alterations involving a cost of less than £10,000; but that in cases above that amount competitive designs should be invited. An amendment to substitute a limit of £5,000 was proposed by Mr. Brinsley and seconded by Alderman Heaton, but it only received the support of 9 members against 46.

At a meeting of the Lower Thames Valley Sewerage Board, held at Kingston on Wednesday week, Mr. Thomas Hawkesley was engaged as engineer to advise the board on the best way of dealing with the sewage of the joint district, with the proviso that he will have no claim to carry out any recommendation he may make.

Lamplough's Pyretic Saline is refreshing, most agreeable, and the preventive of FEVERS, BILIOUSNESS, SMALL POX, SKIN DISEASES, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill. *Use no substitute* —[ADVT.]

Holloway's Ointment should be well rubbed upon the pit of the stomach and region of the heart in that particular form of indigestion which gives rise to palpitation, shortness of breath, and a suffocating sensation. Every distressing symptom soon yields, digestion becomes easy, the spirits light, and good health returns.

Epps's Cocoa.—Grateful and Comforting.—"By a thorough knowledge of the natural laws which govern the operations of digestion and nutrition, and by a careful application of the fine properties of well-selected Cocoa, Mr. Epps has provided our breakfast tables with a delicately-flavoured beverage which may save us many doctors' bills. It is by the judicious use of such articles of diet that a constitution may be gradually built up until strong enough to resist every tendency to disease. Hundreds of subtle maladies are floating around us ready to attack wherever there is a weak point. We may escape many a fatal shaft by keeping ourselves well fortified with pure blood and a properly nourished frame."—*Civil Service Gazette.*—Sold only in Packets labelled—"JAMES EPPS and Co., Homœopathic Chemists, London."—Also makers of Epps's Chocolate Essence for afternoons.

CHIPS.

The port commissioners of Yarmouth appointed, on Tuesday week, on the recommendation of Sir John Coode, consulting engineer, Mr. Richard Seldon, of South Tawton, as superintendent of the extensive concreting operations about to be carried out at the Spur-breakwater and south pier, at a salary of £3 10s. per week.

New schools, in connection with St. Mary's Church, Hollingsworth, erected at a cost of £3,000, and accommodating 800 scholars, were opened on Saturday. They have been erected from the plans of Mr. James Sidebottom, the present mayor of Glossop, at the sole cost of his sister, Mr. A. Houghton being the contractor for the joinery work, and Williams and Hope, Dinting, Glossop, contractors for the masonry.

Doulting Freestone and Ham Hill Stone of best quality. Prices, delivered at any part of the United Kingdom, given on application to
CHARLES TRASK,
Norton-sub-Hamdon, Ilminster, Somerset.
—[ADVT.]

McLACHLAN & SONS, 35, St. James's-street, S.W. Builders, Decorators, and House Painters.
Designs and Estimates.
General Repairs and Alterations Executed.
Experienced Workmen always in readiness, and sent to any part of the country.—[ADVT.]

BATH STONE.
SUMMER DRIED,
CORSHAM DOWN,
100,000 Feet Cube.
PICTOR & SONS, BOX, WILTS.
[ADVT.]

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—London Institution. Dr. Huggins, F.R.S., on "The Photographic Spectra of Stars." 5 p.m.
Royal Institute of British Architects. Adjourned discussion on paper by E. C. Robins, F.S.A., on "Sanitary Science in its Relation to Civil Architecture." 8.10 p.m.

WEDNESDAY.—Royal Architectural Museum. Distribution of Prizes by Right Hon A. J. B. Beresford-Hope, M.P. 8 p.m.
British Archæological Association. "Notes on some Prehistoric Remains near Feating, Forfarshire." By J. Romilly Allen, A.M.I.C.E. 8 p.m.
Society of Arts. "The Causes of Success and Failure in Modern Gold Mining." By A. G. Lock, F.R.G.S. 8 p.m.

THURSDAY.—London Institution. "The Production of Electricity." By Prof. W. E. Ayrton. 7 p.m.
Civil and Mechanical Engineers' Society. "The Application of Hydraulic Machinery to Mines, Gas Works, Grain Warehouses." By J. Coates, F.G.S., A.M.I.C.E. 7 p.m.
Fine Arts Society. Conversazione at the Suffolk-street Galleries. 8 p.m.
Royal Institution. "The Troubadours." By F. Hueffer. 3 p.m.

FRIDAY.—Architectural Association. "Parsonages." By Lacy W. Ridge. 7.30 p.m.
Society of Arts. "Forest Conservancy in India." By Sir R. Temple, Bt., G.C.S.I. 8 p.m
Royal Institution. "The Electric Discharge." By Warren De la Rue. 9 p.m.

SATURDAY.—Parkes Museum of Hygiene. "Water Supply and Filtration." By Prof. Corfield, M.A., M.D. 3.30 p.m.

TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender—it adds to the value of the information.

ALDERSHOT.—For the drainage of Church-lane, for the local board:—
Cranstone (accepted) £325 0 0
[Seven tenders received.]

ASCOT.—For additions to "Beech Grove," for J. Hickens, Esq. Mr. P. J. Byrne, architect:—
Exclusive of painting and papering:—
Abbott and Charman (accepted) ... £375 0 0

BANSTEAD, SURREY.—For supplying and fixing drying-horses and disinfector at the school, Banstead, for the managers of the Kensington and Chelsea school district. Messrs. A. and C. Harston, architects, 15, Leadenhall-street, E.C.:—
Clements and Co. (accepted)... ... £150 0 0
For planting trees and shrubs at the above school:—
Burley (accepted) £264 0 0

BETHNAL-GREEN.—For new sashes to the dining-room windows at the workhouse, for the guardians of St. Matthew, Bethnal-green. Messrs. A. and C. Harston, architects:—

Harradine	£147 0 0
Johnson, J. H....	140 0 0
Heiser	139 0 0
Harris and Wardrop	123 0 0
Lascelles...	115 0 0
Dodds and Robb (accepted)... ...	97 10 0

BEXHILL-ON-SEA, SUSSEX.—For the making of roads and drains at Bexhill:—

Kinnett, G., Hastings	£2,281 0 0
Jenkins, P., St. Leonard's ...	2,000 0 0
Challoner, E., Eastbourne ...	1,958 18 0
Oliver, A., Brighton	1,790 0 0
Bull, E., Hastings	1,744 10 0
Skinner, T., Horsham	1,495 0 0
Cruttenden, F., St. Leonard's ...	1,428 0 0
Dibley, J., Hastings	1,389 0 0
King, A., Hollington (accepted)...	850 0 0

DARENTH, KENT.—For supplying and fixing electric bells at the Asylum for Imbeciles, Darenth, for the managers of the metropolitan asylum district. Messrs. A. and C. Harston, architects, 15, Leadenhall-street, E.C.:—
Sax (accepted) £240 0 0

DATCHET.—For additions and painting at Datchet Lodge. Mr. P. J. Byrne, architect:—
Simpson, A., Egham (accepted) ... £250 0 0

EGHAM.—For villa, for Robert Oades, Esq. Mr. P. J. Byrne, architect:—
Head, W., Egham (accepted) ... £450 0 0

EGHAM.—For pair of cottages, for J. Walker, Esq. Mr. P. J. Byrne, architect:—
Head, W. (accepted) £350 0 0

GREETLAND.—For the construction of drainage works, for the local board of Greetland, near Halifax:—
Jowett, J., Brighouse (accepted) ... £692 0 0

HALIFAX.—For the construction of sewerage works at Hove Edge, for the Halifax rural sanitary authority:—
Roberts, B., Low Moor (accepted)... £192 8 9

HORNSEY.—For alterations at "Howard Arms," South Hornsey, for Mr. Bennett. Mr. H. I. Newton, architect, 27, Gt. George-street, Westminster:—

Smith	£544 0 6
Wood	494 0 0
Lamble	412 0 0
Godden	397 0 0
Coles	360 0 0
Walker (accepted)	328 0 0
For new counter at above:—	
Warne	109 0 0
Heath	99 0 0
Hellings (accepted)	86 17 6
For gasfitting at above:—	
Winn (accepted).	

HORSHAM.—For iron pipes for the siphon at the sewage farm, for the Horsham local board:—
Moon, J., Horsham (accepted) ... £158 0 0

KENSINGTON.—For the following works at the infirmary, for the guardians of St. Mary Abbott's, Kensington. Messrs. A. and C. Harston, architects, 15, Leadenhall-street, E.C.:—
New oakum-room:—
Mills (accepted)... ... ... £105 0 0
Saw-bench, &c.:—
Busby (accepted) £135 0 0
Cleansing and keeping in order the lifts, £15 15s.

LIMEHOUSE.—For new dead-house, for the churchwardens of St. Anne, Limehouse. Messrs. A. and C. Harston, architects, 15, Leadenhall-street, E.C.:—
Walker (accepted) £366 14 0
For new railing, &c., to part of churchyard:—
Walker (accepted) £165 0 0

LONDON.—For pulling down and rebuilding the house, No. 97, Leman-street, E. Mr. W. A. Longmore, architect:—

Read	£989 0 0
Hunt	954 0 0
Lusk (accepted)	780 0 0

NORTHAMPTON.—For the church of St. Michael and All Angels. Mr. G. Vialls, architect, London. Quantities by Mr. L. C. Riddett:—

Roberts, Weedon	£5,500 0 0
Gee, Daventry	5,322 0 0
Cosford, Northampton	5,300 0 0
Watkin, Northampton	5,225 0 0
Martin, Northampton	4,974 0 0
Dunkley, Blisworth (accepted) ...	4,594 0 0
(Architect's estimate, £4,950.)	

NOTTINGHAM.—For making, metalling, kerbing, channelling, and sewering private road in the borough of Nottingham. Mr. Frederick Jackson, C.E., engineer:—

Russell, J. and W.	£267 10 0
Cordon, W.	218 11 0
Smart, T. (accepted)	205 0 0

SOUTH STONEHAM.—For the building of an additional room for the use of the assistant matron, and for other alterations at the workhouse, Southampton:—

Rowland, J. W., Southampton ...	£76 0 0
Witt, Bitterne	69 16 0
Bennett, Woolston	65 11 0
Comport, Bevois Valley	59 10 0
Haynes, Westend (accepted)... ...	47 0 0

STRATFORD.—For painting and decorating at "Carpenter's Arms," Stratford, for Mr. Symes. Mr. H. I. Newton, architect, 27, Gt. George-street, Westminster:—
Walker (accepted) £108 0 0

WALTHAMSTOW.—For two houses and shops at Walthamstow, Essex, for Messrs. Mann, Crossman, and Paulin. Mr. Ernest Shum, architect, 14, Great James-street, W.C. Quantities by Mr. J. G. Raynes:—

Cole	£1,330 0 0
Good, Bros.	1,210 0 0
Fuller	1,090 10 0
Langmead and Way (accepted) ...	1,077 0 0

WESTMINSTER.—For stable-building at Westminster, for the Right Hon. Lord Brabourne. Mr. Henry S. Legg, Christ's Hospital, architect:—

Hatfield	£1,750 0 0
Macey and Son	1,550 0 0

WESTMINSTER.—For new building in Carteret-street, Westminster. Mr. Henry S. Legg, Christ's Hospital, architect:—
Hatfield £5,950 0 0

WOLVERHAMPTON.—For two shelters in the public park Wolverhampton, for the town council:—
Bradney and Co. (accepted) £136 0 0

WINDSOR.—For villa, for R. Ford, Esq., solicitor. Mr. P. J. Byrne, Windsor, architect:—
Dakin, J., Clewer (accepted) ... £1,400 0 0

BEST BATH STONE.
Westwood Ground, Box Ground Combe Down, Corsham Down, and Farleigh Down.
RANDELL, SAUNDERS, & CO., LIMITED,
CORSHAM, WILTS.

Bath Stone.—Every description and the best quality supplied direct from his own Quarries by
ISAAC SUMSION, NEWARK STREET, **BATH.**
Quarryman and Stone Merchant. Established 1791.
Prices, delivered to any part, furnished on application.
—[ADVT.]

PERSPECTIVES in Pen and Ink, and other Drawings made at moderate charges.—J. G BUCKLE, architect, 10, Adam street, Adelphi, W.C.

PERSPECTIVES and other DRAWINGS made coloured, etched, or finished in any style on reasonable terms. — Address, W. PRINCE, Chapel-road Sale, Manchester.

PERSPECTIVE VIEWS and other DRAWINGS effectively rendered in colour or pen and ink. Reference to works published and exhibited by J. DONKIN, Architectural Artist, 17, Argyll-road, Kensington, W.

QUANTITIES.—Quantities taken out and guaranteed by a Surveyor of twenty years' experience upon most reasonable terms.—Mr. CHUTCHLOE, 3A, Poets-corner, Westminster Abbey.

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THE BUILDING NEWS.

LONDON, FRIDAY, JANUARY 21, 1881.

COMMISSION ON PLANS.

CASES recently decided and reported in our columns have made it appear that the remuneration an architect usually receives for works that have not been executed he is not entitled to legally. Lord Coleridge's ruling, in the recent case mentioned in this journal of the 31st ult., cannot have failed to show the uncertainty of the right of architects to charge a commission on work not executed. But long before this instance, other decisions have been made in the teeth of the usage accepted by the profession, and upon which architects plead in justification of their claims. We have only lately pointed out the unsatisfactory system of payment by percentage, that it is neither fair to the architect nor his employer, and that it affords no test of the quality or quantity of the labour bestowed ; and it is now clear that, in the eyes of the law, commission by percentage on work tendered for but not carried out, is "nothing more than a rough-and-ready mode of calculating the *quantum meruit*," to quote the decision of the Lord Chief Justice. Whether legal or not, however, 2½ per cent. on the outlay is by no means an exorbitant charge, as the architect who prepares plans and specification for any building, whether it be carried into execution or not, has to go through precisely the same amount of labour, and he prepares them under the same sense of responsibility. Employers do not, as a rule, understond the *modus operandi* of the architect's business. They appear to be under the conviction that an architect is paid for carrying out his plans, and that the instruments by which he does so are of little or no other value. There is an undoubted misconception on this point. In point of fact, the architect's study and experience is mainly devoted to the planning and general design, and when he has fairly finished his working drawings and written his specification, he has in truth carried out the principal part of his engagement with his employer.

As these misconceptions still exist, and are likely to remain, it behoves the profession, we think, to seriously consider the adoption of a mode of payment more in accordance with the operation of the law applicable to cases of debt arising out of contract. The law as it stands requires the architect to prove the reasonableness or fairness of his claim if resisted, if no specified sum is agreed upon, and it is the difficulty of proving this in many instances which so hardly presses upon the professional man when no amount has been agreed between the parties. The testimony or evidence of members of the profession then becomes necessary; but it may be worth remarking, as the architectural mind is not always legally constituted, that the courts of law are not disposed to admit as evidence the Schedule of Charges of the Institute of British Architects, or any such body, except when such Schedule has been agreed to by the parties in case of dispute or difference. We think a great many architects are under the impression that the schedule of charges adopted by the Institute affords them the security they require; but in the special circumstances to which we are referring this idea is erroneous. Nor can it be pleaded the law is arbitrary in not admitting evidence on one side, though sanctioned by authority, under the special circumstances. For it is only reasonable, that though the Schedule is binding on members of the Institute, it should not be binding on those who are not members, and therefore it would not be so on the employer who had not known or assented to any scale. It therefore appears obvious that the architect's claim can only be supported by proper witnesses, and yet it does not follow that because the jury refuses to take the Schedule as evidence of a reasonable charge, the architect may not avail himself of citing it. There appears ground, from these considerations, for a reorganisation of the system of payment of architects, and the recent decisions in the cases of Wilson v. Landless, and Shields v. Earl of Bective, lead us to the conviction that the sooner the profession agree to charge for their plans as payment for work done, the better. This would require, as Mr. Aitcheson pointed out in our columns, a careful entry of time employed in making drawings by both principal and assistant; but the result, in most cases, would be to increase, rather than diminish, the charges of architects.

Further, there is a remissness on the part of architects generally to undertake the necessary formalities before commencing any work. We lately drew attention to a case (Hunt v. Wimbledon Local Board) showing the absolute importance of the formality of sealing a deed where a public body is one of the parties, as a corporation can only contract under seal. How many architects have not lost months of study and labour in preparing plans for committees, who afterwards turn round and assert their non-liability? A larger number are engaged who never think of getting a valid retainer before they commence, and then wonder how it is that if their employer abandons the undertaking, or engages another professional man, they have no legal claim for services rendered. It is a maxim of law that, till both parties are agreed, either is free, and yet architects continually accept work without the knowledge of this elementary principle. Our "Intercommunication" furnishes abundant evidence of the very incautious manner in which young architects proceed, and the question of the liability for the preparation of preliminary plans turns mainly upon this point.

There is another and frequent source of disagreement between the employer and architect, which mainly arises from want of a proper understanding, and which the now almost historic case of "Moffatt v. Dickson" illustrates. We refer to the employment of an architect to prepare preliminary drawings. In the case we have cited, a committee agreed to pay a certain sum to the architect for his services in examining site, preparing the requisite preliminary drawings for approval, &c. Three sets were furnished, but the committee did not approve of either of them, and they, therefore, rejected them and determined not to proceed further with the plaintiff. Although it was argued the committee had deprived the plaintiff of the opportunity of earning the agreed price, the Court held that a reasonable time had elapsed within which the plaintiff ought to have prepared the requisite preliminary drawings, and that he had failed to do so.

From this important decision it is made clear what the spirit of the law requires, and we also learn that an agreement to prepare preliminary designs, unless carefully framed, places the architect at the mercy of those who have to decide upon his plans. The case of "Moffatt v. Dickson" affords a warning example to the architect. It is doubtless a hard case that he should make several sets of drawings on approval, and yet not receive remuneration; but he does so with his eyes open, and the experience he obtains ought to convince him of the folly of a condition precedent of such a kind.

Equally hard is the case of one who surveys and prepares plans for laying out land for building purposes, and agrees to be paid on a contingency which does not happen—namely, the letting of the land for building. In numerous cases the letting is a matter of chance; the proprietor may die, his executors may dispense with the architect's services, as in another case; or the property may be sold, and the architect has no claim. In such undertakings, there is no legal obligation to pay; but the architect can protect himself in such an event by a clause entitling him to be paid for work actually performed. It is not uncommon for professional men to prepare preliminary plans for public institutions, churches, and building estates, on such conditions as we have mentioned, the only agreement being that if the funds are forthcoming, and the work is carried out or the land let, the architect will be paid. The contemplated event does not take place, yet the architect thinks he should not lose all. An account is made out and sent in, claiming a certain percentage, according to usage; but disappointment follows, simply inasmuch that such an agreement was not binding on the employers at all, under the circumstances.

It is time something should be done to check members of the profession from entering into these rash and one-sided contracts with their employers, and the only way protection can be given is for the societies which represent professional interests throughout the country to agree upon a more satisfactory basis for the payment of preliminary plans, which may be accepted by all practitioners in their own interests. As we have seen, architects place themselves in positions out of which the law cannot help them, by agreeing to do work on speculation, and as long as they are satisfied to proceed on these conditions, they must not be surprised to find their labours underrated by the public, and even the usual charge for commission disputed on the ground that till a building is executed the architect has earned little or nothing.

REFINEMENT AND NEATNESS.

THERE was never an age, perhaps, when matters were made so pleasant as now to the great mass of people who want to seem better off than they are; for never before did every valuable thing find such close and cheap imitations. And this is true not only of the materially, but of the spiritually, valuable. It is not merely that the poorest can make a sham display with false gold and false jewellery, but that the most ignorant can show off with shallow imitations of learning, and the most obtuse with plausible pretences to taste. Everything that is difficult to get has a counterfeit than is easy to get, and this holds good in art matters, quite as much as in trade and manufacture.

Architectural simplicity, for instance, is the last perfection of the consummate artist, and takes a lifetime of thought and study to attain; but everybody can make a building bare, bald, and vacuous, and then pride himself on the "simplicity" of the design. Architectural refinement, again, is not to be had for the wishing; it springs from delicate perception, unwearied care, and perpetual pressing forwards to the better and yet better; but there is a cheap substitute for it within the idlest person's reach, which is often misnamed, and palmed on the world as the real thing. This substitute is common mechanical neatness.

The worshipper of neatness usually talks much of modern civilisation, and thinks those are barbarians who can see any merit in roughness, unexpectedness, and irregularity. That these things can be used to effect great artistic purposes strikes him as absurd, for his central idea of art itself is neatness. Neatness, in short, is the end of

all his labour, the goal which he has constantly in view, and the highest praise that could be written on his tomb would be that he left the world neater than he found it. Whether he is dealing with town or country, with streets or fields, he sticks to the same principles, and aims at the same petty, effeminate results. Trust him with a cathedral, and he will scrape it over, as Lincoln was scraped; trust him with a bit of the primæval forest, and he will drain it, and smooth it, and gravel it, as Epping Forest is now being drained and smoothed and gravelled. It is the work of his life to take the naturalness out of nature, and the manliness out of men, and to make them both appear, not as they are, but as he in his wisdom thinks they ought to be. When, unhappily, such a man becomes an architect, we know on which side to find him; on the side, that is, of tameness, deadness, and dull, soulless uniformity. He has a mild tolerance for the Greeks and Romans, whose work, he considers, was fairly neat, considering their lamentable want of machinery; but the unexpected fancies and shameful irregularities of all subsequent builders, down to the time of the Renaissance, totally upset him. Carelessness, and incompetence, he feels, prevailed everywhere for a thousand years, and the commonest foreman, in these civilised days, does his work with an accuracy and regularity which would make the greatest builders of past ages blush. For he never doubts for a moment that mechanical correctness was their aim, as it is his, only that, living in a dark, uncivilised age, he supposes that they failed to reach it.

If mechanical neatness is art, there is no art workman like the steam-engine, and no age so supreme in its art work as the present one: a conclusion from which the worshipper of neatness, if he had the courage to avow his real opinions, would scarcely shrink. By machinery of one sort or another we can cast, and stamp, and plane with a uniformity never before either attained or sought; and if the human mind really does want, for its satisfaction, to be everywhere presented with long series of precisely similar objects, there are plenty of people now ready to supply it. We venture to think, on the contrary, that this is precisely what it does not want. At first sight, no doubt, regularity is striking; but the question in art is not what strikes most at the first glance, but what bears looking at longest. To bear looking at long, every object of art must have, as every object of nature has, an all-pervading irregularity behind its regularity; a constant freshness and unexpectedness gained by everlasting deviations in one direction or another from the typical form. Every leaf of an oak-tree is recognisable as an oak-leaf; yet every leaf deviates in one way or another from the ideal oak-leaf shape, and no two leaves are alike. How much neater if they were all stamped out uniformly, in pastry-cook fashion, and stuck on to a tree with equidstant branches at equal angles all round its trunk! This is our neat man's idea of art; and though oak-trees are intractable, buildings are not—as witness his triumphs in our London streets. The oak-tree is coarse and unrefined, he thinks; though good enough, perhaps, for the country; but the system on which it is formed will not do for districts of high civilisation, such, for instance, as Whitechapel and Walworth.

In real art there is a place for roughness and for smoothness; for regularity and irregularity; for unevenness and for neatness; they are all means to an end, and not, as some people make them, ends in themselves. The neat man picks out his bricks of uniform colour, or daubs them over to make them uniform, and finally paints upon them a thin imitation mortar-joint. His work is raw, false, and offensive; but he rejoices in it, because it looks neat. The architect of old, building in brick, did not make it his aim that the work should be neat or not neat. What he aimed at was that it should be strong and beautiful. Brickwork with thin joints is not strong, and a flat mass of unvaried brick-colour is not beautiful; so he had thin bricks and thick mortar-joints, and gave to the whole mass, for strength and beauty, as much texture, light and shade, and variety of tone as it admitted of. He filled his work, in short, with delicacy and refinement, not with neatness, and so it offends the multitude who can appreciate the last quality and have no eyes for the former. The sculptor of old, carving a bas-relief for some lofty position, did not make it his aim to finish his figures neatly or not neatly; he meant them to look right when fixed, and to stand out with life, character, and expression; and so he left the surfaces nearly flat, and cut the edges back at right angles. The neat man, if misfortune has made him into a sculptor, never thinks for a moment about the effect of his work when it is up; he rounds, and smooths, and scrapes, and polishes it, and so will never do anything that any mortal cares to look at, as long as files and scrapers and sandpaper endure. The mosaic-worker of old, again, did not aim at setting his mosaic neatly or not neatly; he was thinking about something a good deal higher, namely, the effect of the picture when finished. To get tone and texture he broke up his material into bits of all sorts and sizes, fitted them closely where evenness of surface was wanted, put them wide apart where rawness of colour threatened to intrude, turned them artfully round this way to catch a high light, and artfully the other to deepen the shadows, and the force and refinement of the work are admired for century after century. At last our intelligent age arrives, the great testing time has come, the neat man makes his appearance, and laying a straight-edge across the face of the mosaic, declares that there is not a bricklayer in London who would not have done it better.

FLOODS.

IN the United Kingdom and in other countries the cry comes of the waste and damage caused by the heavy rainfalls, generally more or less prevalent during this season. Whether or no the downpour is greater or less than in past years does not materially affect the question of quality or extent of damage sustained, more particularly by those interested in land and its profitable culivation. The dangers to and loss of property are, however, in a great degree concentrated, and the general damaging influences of the floods sustained in the low-lying lands through which the swollen streams and rivers hasten with accelerated speed and volume to the sea. Hitherto such loss has been borne with an almost Oriental apathy or indifference, the sufferers bowing meekly to the periodical visitations of Nature's destructive agencies, disregarding in such circumstances the remedial means which might readily be applied for their mitigation, if not permanent avoidance.

A run through the Midland districts of England by either of the three leading railways having their termini in London, will indicate that in the counties of Oxford, Bedford, and Stafford a chronic state of flood prevails for many months of the year. The cause of this congestion, as it were, is not difficult to find, for the tortuous character of the several streams passing through these counties indicates with too much certainty that during abnormal rainy seasons, neither their capacity nor direction are in keeping with the duties thrust upon them under such circumstances and conditions. It may be considered that in streams or rivers so circumstanced, regardless of riparian rights of feudal or other equally obnoxious origin, they cannot, during the seasons of flood, pass on the swollen stream with the needful velocity. How, then, is this destructive waste to be overcome, and how are the requisite measures for its permanent cure to be provided? Hitherto remedial measures have been offered in increased resistance to the concentrated and impeded flood, or in altering the direction of the streams, so as to improve their velocity, and lessen the friction caused by the eddies and other obstructive causes, due to the winding character of their course.

Rivers debouching into the sea may be regarded as the ultimate channels which return again to the ocean the evaporated water that from various altitudes descended in the state of rain, after being collected from affluents and tributaries, gravitating by the universal natural law to the source from whence they had originally sprung. Rainfalls in mountainous or elevated districts are greater than those in the plains, and if the high lands were provided with catch-water basins or reservoirs, the damage caused by the impetuous rush of waters to the sea, would, if not averted, be at least considerably mitigated. Every river and stream has had its geographical position accurately defined by nature, and its gradual progress and ultimate settlement is easily traced in the geological periods through which it has passed. Making allowance, therefore, for the amount of water which may be evaporated and absorbed during the seaward course of a rainfall, a pretty reliable approximate estimate may be formed of the quantity of water which must enter the natural channel of outpour to the sea. There is no such sensible consideration of this question, however, because there is not, under existing laws, any remedy open to the flooded landlord or farmer whereby he may receive compensation for the damages sustained by the uncontrolled water running off the land of his more elevated and fortunate neighbour. Under certain conditions, one mine-owner cannot flood his neighbour's underground workings without incurring serious pecuniary responsibilities, and it is equally reasonable, we would imagine, that one landowner should be under the obligation to prevent damage to his neighbour, caused by his own avertible negligence.

From our point of view the damage so fruitful of serious consequence to many at this season is capable of controlment, not only with advantage to the sufferer, but it may be accompanied with undoubted benefit to him who, it may be unconsciously, inflicts on his neighbour a substantial and, so far as he is concerned, under present circumstances, an apparently unavoidable wrong. While this course of periodical damage is proceeding the landowner or farmer in the upper districts is committing a waste and loss to himself, for if the water which causes the difficulty had been carefully conserved, it would, in the seasons of drought, prove beneficial to his own parched lands. Why not, then, in the districts surrounding the most fertile lands which receive the waters, organise a system of contoured reservoirs at the most convenient and beneficial height? Such an arrangement, not necessarily of an expensive character, would check the flow of water and hold it in readiness for the dry season, or, at all events, to meet the requirements of irrigation which might form an adjunct of any measure of this kind. The higher the altitude the greater the rainfall; unavoidably so from fixed and unalterable natural laws, and it is there, in this climate at least, that the more sterile soils are found. The cost of the needful land, therefore, to catch and store rainwater, would not be high, while reservoir construction might be, by the agency of concrete, carried out at a comparatively moderate outlay. The site

of reservoirs, as also their form and extent, would be controlled by the divisions into districts of each particular locality, so that the present course of ditches and streams would still, in an improved form, provide for the natural drainage of the soil, and nothing more. The accumulated and carefully-stored water of the reservoirs would be reserved for distribution in seasons of extreme drought, or if in sufficient quantity, used for irrigation purposes. A rainfall thus put under profitable subjection would, while removing the dangers of floods at, perhaps, far distant points, prevent the waste of soil and artificial fertilising agents in the immediate locality of its storage. Thus, while contributing to the protection against destructive floods at a distance, such an arrangement would secure the means of increased fertility at home. The picture thus outlined may be, by some, regarded as too sanguine, and somewhat speculative in character, although we believe it only requires a moderate amount of concession all round to effect its realisation.

The machinery of such a scheme would of necessity require to be of an elastic and all-pervading kind; for unless perfect unanimity prevailed amongst the parties interested, no satisfactory progress towards its successful prosecution could be possible. Governmental assistance and control, under such a system as that which regulates and measures the subsidies to local boards, for sanitary and other schemes, would be the most desirable. The bondage of the land, and those who own it, generally speaking, would be an insuperable bar to progress of any satisfactory kind; and, therefore, the first step would be of necessity a legislative measure, clearing the way of all sorts and kinds of agrarian enthralment. Freedom from local interference, and security to guarantee the best system or plan to effect the object desired, would clear the way for the engineer and his constructive associates to perfect, in the most approved manner, the best and fittest system of water-conservation. Concrete reservoirs and conduits of an inexpensive but substantial character, covered in to prevent evaporation, and large open lakes or ponds, in which fish may be bred and grown, would not only effect the object desired, but render possible the cultivation of some barren soils now outside the pale of useful or profitable employment. There could be no better opportunity than the present for a successful handling of this most important question; for the landed interest, and those within its influence, are in such a condition as must compel them to assist a measure of this kind, calculated as it is to remove obstacles which greatly interfere with the profitable use of some of the richest lands in this country.

Engineering science is sufficiently conversant with the details of such a comprehensive measure that would enlist its services in this wide direction, to which hitherto it has but sparingly contributed its beneficial influences. Expensive works are not necessarily required to carry out the details for the purposes of such a scheme as appears to us desirable to avert the waste and losses we have pointed out. The cultivation of the land of this country has not been hitherto conducted on the best lines to secure profitable returns for capital invested, simply because the relations between the owner and the tiller have not been based on a permanent footing, or else wanting in the most essential condition of sensible mutuality. Between these two opposing forces, the soil—the common heritage from a bountiful Nature—is in danger of reverting to its pristine barrenness, because of the breakdown of a system out of harmony with national progress and true commercial development. The farmer and his lord have generally considered that the cultivable land of the country and its prosperity, or its converse, were matters with which they only were concerned; but the early future will prove that, in the circumscribed area of our country, teeming with a willing and industrious population, the land cannot be said to be utilised where the first efforts of its cultivation is to denude it of the labour by which it ought to be cultivated. Big or small farms is not so much the question as that the best results should be forthcoming, and they cannot assuredly be when such floods as we see from day to day recorded prevail. Not only are these occurrences opposed to profitable land-cultivation; but they, in even a more disastrous manner, cause a great destruction of industrial property in towns and neighbourhoods built on the banks of rivers which, from ignorance or apathy, are permitted to flood and overflow.

There is abundance of engineering ability in this country not at present too profitably employed, and we trust that our remarks on what we consider a most important subject may lead to an active consideration of the conservation of rainfalls and controlment of disastrous floods.

METROPOLITAN RATING.*

THERE are few persons not interested, more or less directly, with the assessment of rateable property, and a handbook giving in a concise form the principal provisions of the Valuation (Metropolis) Act, 1869, with a summary of the appeals recently heard before the Court of General Assessment Sessions, must be of value to all who desire to make the assessment of rateable property more uniform. Mr. Edward Ryde's treatise has become a recognised textbook on the subject, and a new edition has just been issued by Messrs. Crosby Lockwood and Co., revised and brought down to date by Mr. Edward Ryde and Arthur Lyon Ryde. Besides giving a synopsis of the Act, the present edition furnishes a complete record of the proceedings of the Court of Sessions from 1872 to the last Court of 1880. The author's reputation as a valuer is a sufficient guarantee of the reliability and value of the work, and the decisions of the Court are given in many important cases of appeal. For the information of those who have not read the Act as applied to the assessment of property in the metropolis, we may furnish a few particulars. As regards the disputed question as to the definitions of "gross estimated rental," and "net rateable value," these terms are defined as follows in the Act:—"The term 'gross value' means the annual rent which a tenant might reasonably be expected, taking one year with another, to pay for an hereditament, if the tenant undertook to pay all usual tenant's rates and taxes, and tithe commutation, rent-charge if any, and if the landlord undertook to bear the costs of the repairs and insurance, and the other expenses, if any, necessary to maintain the hereditament in a state to command that rent." "The term 'rateable value' means the gross value after deducting therefrom the probable annual average cost of the repairs, insurance, and other expenses as aforesaid." These definitions are important. The digest of the Act given by Messrs. Ryde, deals with the various provisions in due order. As regards making of valuations, a new "valuation list" of each parish is to be made every fifth year, *i.e.*, in the years 1870, 1875, 1880, 1885, &c.; a supplemental list is to be made if necessary in each of the first four years of every succeeding period of five years, containing the alterations which have taken place, and hereditaments affected by them. It must be remembered the term "year" in the Act means the twelve-month commencing with the 6th of April, and ending with the same date in the succeeding year; every person ratable is, when required, to fill up, and make a return on a form supplied by the Surveyor of Taxes to the overseers, as to the rent he pays, the owner of his house, annual value, &c., and the Assessment Committee may also require a return at any time. Objections can be made before the Assessment Committee within 25 days of the deposit of the list, by any person who feels himself aggrieved by reason of the unfairness or incorrectness of the valuation, or by reason of the improper insertion or incorrectness of any matter in the valuation list, or by the omission of any matter therefrom; but the notice of objection must specify the correction the objector desires to be made. Any ratepayer, surveyor of taxes, and any overseer with the consent of the vestry, who may feel aggrieved by any decision of the Assessment Committee on an objection to which he was a party, or by any decision of Special Sessions, may appeal against it to the Assessment Sessions. Every information for these purposes, and on the proceedings on appeals are given in the synopsis of the Act, and the schedule of deductions to be made from the gross value will be found useful in estimating the rateable value. We here give the leading deductions. For houses and buildings or either of them without land, other than gardens, where the gross value is under £20, a maximum deduction per cent. of 25, or 1-4th, is allowed; for houses and buildings valued for the purpose of inhabited-house duty, where the gross value is £20, and under £40, it is from 20, or 1-5th, to 16⅔, or 1-6th; for buildings not liable to inhabited-house duty, and are of a gross value of £20, and under £40, the deduction is the same; land with buildings (not houses), the deduction is 10, or 1-10th, and land without buildings 5 per cent., or 1-20th. Mills and manufactories are a class for which a rate of deduction of 33⅓, or 1-3rd, is fixed.

Some important decisions in respect of the rate of deduction to be made from the gross value are furnished; Messrs. Waterlow and Sons' appeal in 1871 is a typical instance of the blunders made by the earlier Assessment Committees, especially in the deductions allowed for repairs to machinery; other decisions concern the notice to be given to the ratepayer whose assessment has been increased by the committee without the notice required by the Act; in one case cited the Court gave the appellant's costs. A more useful case to the surveyor or valuer, called upon to value property, is given in the appeal of the Corporation for Middle Class Education, against the assessment of the Holborn Union Committee. The Committee had assessed the property upon the basis of cost, the land being assessed upon a calculation of 3 per cent., and the school-buildings at 5 per cent. upon cost, or £1,500 gross, and £1,250 rateable value. Mr. Clifton had valued the property at £750 rateable value, as the highest rent the place would fetch in the market for any purpose; the building measured 7,344 superficial feet, and contained 30,000 super. feet of floor-space, the playground measured 37,200ft. The building he valued at £600, the playground at £300, making a gross value of £900, and deducting one sixth, £150, the rateable value was £750. Mr. Ryde, estimated the gross value at £300, and the rateable at £250. On the other side the respondents took the actual cost of land at £25,000, and the building cost of £15,000. The court altered the list by reducing the gross value to £1,080, and the rateable to £900, clearly showing that cost was not made the measure of rateable value. There is more reliance to be placed on rent actually paid, and the decision in case cited, of Lord Carington's appeal against the assessment of

* Metropolitan Rating: A Summary of Appeals heard before the Court of General Assessment Sessions. By EDWARD RYDE and ARTHUR LYON RYDE. 3rd Edition. London: Crosby Lockwood and Co.

his house, shows that the rent paid was considered nearer the value. In another instance, the judge expressed an opinion that the parish should show that the extra value belonged to the situation. The drift of these decisions of the Court appears to show that the rent which a tenant can afford to pay for certain premises is a more correct criterion of rateable value than the actual rent paid in all cases.

The rating of railways forms a large part of the appeals against Assessment Committees, and the cases cited by the authors, particularly the details furnished of valuations, are extremely useful. Mr. Ryde's evidence given in the appeal of the South Eastern Company, against several assessment committees, may be mentioned. He there estimates the cost per carriage mile of maintaining and renewing narrow-gauge ordinary carriages and waggons at a farthing, and the rateable value of all the stations on that line is estimated at 5 per cent. on the gross receipts of the company. "It was always his practice to consider that the tenants' capital required in each parish was a sum equal in amount to the gross receipts in that parish, and as a practical man he believed this to be infinitely the most practical and satisfactory method of treating the subject." This method of arriving at the tenants' capital was adopted by the Court, which reduced the rateable value of the line in the parish of Lee, the decision ruling many others. The Court decided that maintenance and renewal of way should be calculated on the *carriage*, not the *engine*, *mileage*; also that where interest on cost of construction is taken to be the rateable value of a station, the rate should be 5 per cent. An important reservation, however, is made by the author, who shows that this rate cannot fairly be taken as applicable to all stations, such for instance as the little-used Blackfriars Station, of the London, Chatham and Dover Railway. To assess such a station as equal to 5 per cent. upon its cost, would be to "assess it at an annual value which it would be unreasonable to expect any tenant to pay for it." Mr. Ryde's valuations of the London and South Western Railway Co's. stations at Waterloo and Vauxhall afford a useful hint. The valuation made on behalf of the Assessment Committee showed that nearly half the rateable value assessed was made up by adding the cost of the brick viaduct upon which the station stands, but, as Mr. Ryde points out, the most valuable station for a tenant is one on the natural level of ground, and any expenditure to bring the station up to its level is a deduction from, rather than an addition to, its value. In this case, the rating was reduced from £22,040 to £14,134. The rating of water-works is exemplified by the citation of several cases, and the evidence given on the question of productive mains—those which are tapped by service pipes, and unproductive mains, those not so tapped—is very important.

The rating of gas-works, canals, residential chambers follow, after which are given the supplements containing brief abstracts of cases heard before the Court of General Assessment Sessions, from the year 1872 to the last Court. In these we find many decisions of value, as that on the appeal of the governors of St Thomas's Hospital, in which the assessment was made upon the structural value of the property. Mr. Ryde's figures, supported by Mr. H. Currey, and Mr. E. N. Clifton, put a gross value of £6,000, reckoning 600 beds at £8 each, and a ratable one of £5,000, after making the statutable deduction of one-sixth. Among the numerous decisions of the Court, we find a detailed account and valuation given on an appeal of the London Tramways Company. It is obvious that the principle of dividing the earnings among so many distinct parishes, in proportion to the mileage of the route in each, is the one that is most agreeable to common-sense. In another instance, the School Board for London appealed against the rateable value of their schools in Tower-street, the land of which had been estimated at more than the Board's valuation, but the respondent's valuation was accepted.

The case of J. Willing and the Assessment Committee of St Pancras, argued in the Queen's Bench Division, and the judgment of Mr. Justice Mellor, shows that the granting of a license for a mere temporary occupation of the land, such as advertising, is not the kind of occupation to be rateable. These summaries embrace a variety of cases concerning different kinds of ratable property, which will be found of considerable use in future appeals. From what we have already said, and from the evidence furnished in the cases throughout, it is quite clear that the outlay of capital furnishes no satisfactory basis for ratable value, but that the valuer must make an independent estimate of the rent the property should yield. A man or a company may spend thousands of pounds unprofitably and foolishly, and what once might have been valuable may have so far deteriorated by circumstances that it is not safe to assume a fixed or an old rental value. Several cases proving the above remark are mentioned, and the appeal of Sir Dudley Coutts Marjoribanks, is an instructive example of the assessment of a large West-end mansion.

Business premises, factories, and a variety of other buildings, the premises of water-companies, etc., will be found in the summaries of the book, and a useful appendix is given showing the gross and rateable values of the "valuation lists" of the several metropolitan parishes and unions. A comprehensive index is added, and generally the new edition of Messrs. Ryde's work may be accepted as a safe and reliable guide by all surveyors and valuers of property in the metropolis.

SANITARY SCIENCE IN RELATION TO CIVIL ARCHITECTURE.

AT the meeting of the Royal Institute of British Architects, held on Monday evening, the discussion of this subject, arising out of Mr. E. C. Robins' paper, was resumed. The President, Mr. J. Whichcord, F.S.A., occupied the chair, and, in inviting observations, suggested that in the first part of the proceedings members should confine themselves to the general question of sanitation, reserving the consideration of warming and ventilation till a later period of the evening.

A letter was read from Professor HAYTER LEWIS, who had moved the adjournment of the discussion, expressing regret that his somewhat sudden departure from the country would prevent him from being present, for he had proposed to treat the subject in a somewhat different manner from that adopted by Mr. Robins. He would assume that they had a town—London, if they pleased—in which sanitary requirements were perfect, according to modern theories; in which, 1st, the soil and other offensive pipes should be well ventilated; 2nd, the admission of foul air from the sewers into the house-drains should be prevented; 3rd, the sewers themselves should have their foul gases carried off by ventilating openings; 4th, the storm-waters should be conveyed away by a separate system of drainage; 5th, the smoke nuisance should be abated; and 6th, the foul contents of sewers should be returned to the land in place of being hurried away from it to poison our rivers. There were in London about 550,000 houses, and they would have in that case nearly two million ventilating pipes discharging into the air. These pipes must be prominent, and yet could scarcely be treated æsthetically, so as to indicate their purpose. He ventured to think that these pipes would not have a much more agreeable aspect than the present chimney-pots. Further, from the absence of storm-waters, the contents of sewers would be less diluted, and more liable to become offensive. The absence of carbon and sulphur from the air, caused by the abolition of smoke, would deprive the atmosphere of many of the oxygenising properties it now possessed, and make it more unhealthy for people to breathe. It seemed to the writer that they ought to put before engineers a problem of how the germs of disease could be destroyed before passing into the air, and the method adopted by Major-Gen. Scott for making cement seemed to him to be a step in the right direction, in connection with the use of earth-closets and dry systems of removal.

Mr. GILBERT REDGRAVE read a communication from Major-General Scott, C.B., who said it was important to prevent the creation of sewer-gas. In the small-pipe system of Mr. Isaac Shone this evil was reduced to a minimum; but the danger existed in every water-carriage system, and it was desirable to obviate the formation of gas as far as possible. Any plan by which the foul liquid could be deodorised at an early period of its flow must have advantages. His proposal was to clarify the sewage at the highest point of the town, and so to neutralise its noxious qualities at an early stage, instead of at the outfall. The writer went on to explain in detail his plan, as carried out in the Ealing experiments, showing how lime could be poured, in measured quantities, from hoppers into the sewers at numerous points, and claimed that a clear effluent would result, while the residuum could be utilised for cement-making.

Mr. ROGERS FIELD, B.A., C.E., remarked that the letter from Prof. Lewis seemed to go to the root of the whole question of true sanitation. He had asked: You have a great number of ventilating pipes from your houses poisoning the air of the metropolis; can you find no means for preventing the exit of foul gases? He believed that it was perfectly easy to prevent these foul gases from being formed. They resulted during the decomposition of organic matter, and hence the aim should be to immediately remove all effects of organic matter before it had time to decompose. The simplicity of this was so great that its paramount importance was in danger of being overlooked. If sewers were properly constructed, flushed, and ventilated, there was practically no smell from them; any offensiveness proved that the discharge was impeded. It was a mistake to imagine that the foul emanations arose exclusively or principally from the sewers; they occurred quite as frequently in the house-drains, and he had seen instances in his own practice. The house-drains should always be so cut off from the sewer that the former could be dealt with separately, and even then keeping it sweet, while practicable, was not easy of accomplishment. The endeavour should be to make everything self-cleansing. It was foolish to have too large a drain, as then it retained more foul matter. No absolute rule could be laid down; but he did not find it desirable to make the house-drain or siphon in a large mansion more than from 4in. to 6in., and for ordinary houses the size might be considerably less. With reference to the fall of drain, the rate allowed by many builders, and even architects, 1½in. to 10ft. was quite insufficient to keep the drain clear; about twice as much fall should be given. If a self-flushing apparatus were used, however, the incline might be very much less; in a large mansion with a 9in. pipe flushed once a day he had been successful with a fall of but 1 in 330. The only mode of insuring that drains should be truly laid was, he had found, to adopt Mr. Rawlinson's suggestion, that all drains should run in straight lines from point to point, with facilities for inspection and cleansing at every change of direction. It was not enough to deal with the drains only; the w.c.'s should be self-cleansing. The D-traps were terrible offenders in retaining foul matter, and the use of these and of pan-closets should be forbidden. He was glad to see they were not allowed by the new regulations issued by the Local Government Board, and he hoped they would soon become obsolete—except in London, where the Public Health Acts did not operate. The modern difficulty in sanitation was that there were such an immense number of apparatus that few people could tell which were good and which bad, but they could always be tested by the smell—by applying the nose to the ventilating pipe. The Sanitary Institute had organised an exhibition, in which prizes would only be given to closets after trial, and he called attention to this mode of adjudication as furnishing some guide

and guarantee to the public. He could not agree with Mr. Robins that the sanitary principles now insisted upon were carried out by architects many years ago. Only five or six years since the plan of disconnection was met by a series of objections, which might now be said to have been effectually answered. He had found, from inquiry, that in no case where an external soil-pipe was well constructed was it ever frozen up, and this was the experience of Mr. Norman Shaw, Mr. Eassie, and others.

Mr. EWAN CHRISTIAN asked how individuals could deal with the water-companies; because if the public were compelled to adopt the waste-preventers, or rather "waste promoters," stipulated by the companies, people would either be unable to adopt the flushing recommended by Mr. Field, or would be tempted to alter their fittings directly the inspector turned his back on the house. The Legislature would have to deal with these gigantic monopolies, in order that we might adopt flushing, which he agreed with the last speaker, was very necessary.

Mr. WALLACE PEGGS spoke of the advantages of disconnection of soil, bath, and sink pipes, and of providing manholes for inspection. The latter could be cheaply built in Portland cement, but for the future he should line them with white glazed bricks. He stated that he had recently found in a 16th-century house what he believed to be the earliest-known instance of disconnection. Beneath the sink he found a hollowed stone ending outside the house, with open chamfered lip, from which the waste water fell into an open trough. He thought, from a recent inspection of the Bedford-park estate at Turnham-green, that Mr. Norman Shaw's system was there placed under a disadvantage.

Mr. ROBERT RAWLINSON, C.B., chief engineering inspector to the Local Government Board, said he thought he might claim some credit for the system of house-drainage now generally adopted —small pipes laid in direct lines, with manholes at all changes of direction, for he had advocated it since 1850, and several points in it had been suggested to him by one of his best assistants, Mr. Hugh McKie, now borough surveyor of Carlisle. It had been wisely said that to know our mistakes was the first step towards correcting them, and he would, therefore, mention a few which had come under his supervision. One of these was to carry the drains entirely under the basement of a house. He could refer to a house in Kent, built within the last six years for a Cabinet Minister, which became so unbearable within twelve months from the state of the drains and their bell-traps, that he could not live in it. The speaker could not tell the architect's name, for he had never inquired. When he was called in he had it remedied, first by having every drain that could be reached pulled out, and in the cases where they could not be reached under the floors to fill them up solid with concrete to the outside wall. All the bell-traps were removed, the cesspools emptied and filled up, and ventilators put on to the pipes. Another case was the seat of the Duke of Sutherland. When he was requested by his Grace to visit it, he found every w.c. in the castle except one stopped with brown paper, and it was explained to him that when company were staying there the stench had been so awful that it had been necessary to get rid of all the guests and close the building. He found a splendid fall from the house to the sea; but there were several cesspits, and the drains went under the premises, and a clerk of works had carefully closed every opening from the cesspools with Portland cement, so as to hermetically seal the foul gases within the drains. He at once had all the cesspools laid open and the closets reopened, and the housekeeper told him next day that the house was as sweet as possible. On his advice every cesspit was filled up with concrete, the drains relaid, and a ventilating shaft, freely open, was carried up in a plantation. The remedy had proved effectual, and the total cost was less than £50. He had come to the conclusion that it was not necessary to place a drain-pipe beneath a house, even if it were as large as that in which he was unfortunately situated. He was supposed to teach the public on sanitary matters, and they came to consult him along a corridor which was pervaded by a most abominable stench. He complained to H.M. Office of Works, and they referred the matter to the Treasury, and the consequence was that he was told he was a very improper public servant, and was called upon to apologise. No part of a drain should be laid in such a position that it could not be examined or tested except at great expense and inconvenience. By the introduction of manholes it was quite possible and easy to provide such means of inspection that the householder was always master of the situation. As to the ventilation of sewers, the letter from Professor Lewis read that evening only showed how dangerous was a little knowledge. There were hundreds of miles of sewer in London, most of it well laid; but, unfortunately, where the fall was least, as in Belgravia, it was often in the worst condition. If London was not dealt with by some system of flushing, the main drainage works would, in future dry summers, prove a curse, and not a blessing. Such a system could easily be arranged, and would not necessarily be very costly. The cause of emanations from sewers was bad construction — either leaky joints which allowed the liquid to escape into the surrounding soil, and retained the solids, or the dimensions were too great for the volume of water to scour them. But a sewer need not be so foul, and he remembered hearing a distinguished chemist at the meeting of the British Association at St. George's Hall, Liverpool, state that he had analysed the air in the large main sewers, which were well ventilated, and found it actually purer than that in their meeting-room. It was constantly objected that sewer-ventilators stank, and no doubt they did; but it was a thousand times better that the ventilators should stink than that the foul smells should be sealed up in the sewers. When sewers were first laid down, about half a century since, they were followed by outbreaks of typhoid fever, in consequence of the omission of ventilators, and the result was that people were forbidden to drain into them, and cesspools were made, in compliance with an Act of Parliament. Some people wished to introduce the pail, dry or wet earth, and other so-called dry systems; they had his cordial sympathy, but he was convinced they would soon abandon the attempt. The pail system was at once troublesome, inconvenient, and costly. A few weeks ago, when at Rochdale, he was told by the town clerk and surveyor that the town suffered a dead loss of £10,000 a year, although the refuse sold at from £3 to £4 per ton. They were often told that it was wasteful to throw into the sea the material that would enrich the soil; but it needed but a slight knowledge of political economy to understand that if 20s.-worth of sewage cost 30s. to put upon the land, there was little advantage in utilising it. Many towns still utilised the sewage, but in no case was there a resultant profit. The small-pipe system of water-carriage was the most economical yet introduced, and it had been carried by the Americans further than here, as at Memphis, where a town of 40,000 inhabitants was sewered by 9in., 6in., and 4in. pipes, the rain-water being carried away over the surfaces, and the plan worked admirably. Small pipes were adapted at Alnwick Castle in Northumberland, although subject to violent floods, where an 8in. pipe carried away the sewage, where a 12ft. tunnel would not have sufficed had the storm-waters been permitted entrance. A good instance of the advantages of the system he was advocating was Earl Spencer's mansion in St. James's-street, which was now as free from the sewers of London as if it stood in the middle of a park ten miles away.

Professor KERR declared it was very clear that the engineers, and not the architects, had brought about this most pestiferous system of sewerage of which they had heard, and that the blame should and ought to rest on them. But as an architect he must be allowed to confine his attention within the four walls of the house. Looking at the question, then, as architects of houses, there was no need to consider these prodigiously complicated appliances which opened out an ever-lengthening vista of increasing cost, increasing trouble, increasing ingenuity, and increasing failure. There should be none of these appatus nor any plumbing inside the house; they should be driven out, bag and baggage. It was those ingenious gentlemen who talked about scientific plumbing—a modern race who had sprung up within his own recollection—who had caused all this trouble, a nuisance which had gone increasing till they were actually asked to look at a number of w.-c.'s which had been tried and tested for prizes. The speaker exhibited and described a large plan, showing the mode in which he proposed to deal with the drainage plan of an ordinary London house. It was of no use telling people they must keep their drains outside. They could not do it in London, for the water and sewering pipes came in from the street in front and caution required that the sinks, closets, lavatories, and other places where the water was used and poured away should be at the back. The pipes must, therefore, go from front to back, and this he should do in a subway carried under the basement. At the rear of his ordinary house he had planned an annexe containing all the plumbing, the closets, sinks, bath-rooms, &c., and having over it the cisterns. In one external shaft open at the top he could carry up all the gas and water-pipes, the soil-pipe, &c., and at the street end of the subway the engineers could arrange all their own appliances. This arrangement, combined, of course, with the air-proof concrete bed under a house, now compulsory in the metropolis, would enable the architect to keep all filthy appendages at the rear of the premises, and outside the better part of the house. He was aware that to make an impression on the public it was necessary to exaggerate the case; but he must deprecate the immense amount they had heard during that discussion; and he would plainly say he did not believe what Mr. Rogers Field and others had said about sewer gas. He had never yet known a case of typhoid fever which could be distinctly traced to the drains. Still he fully agreed that sewers and drains should be ventilated as fully as possible; if people did not like the smell, they must submit to it, for it was their own fault.

Mr. R. B. GRANTHAM, C.E., remarked that his occupation was that of constructing main sewers, and he must leave the consideration of house-drains to others. The difficulty of ventilating sewers through long and narrow streets was very great. He had now to construct sewers in an Italian town of this character, where he was trying ordinary ventilating pots set on shafts in the streets, and if they did not answer he should place the ventilators by the sides of the house-chimneys. He was acquainted with the experiments at Ealing, made by General Scott, and described that evening in his communication; but although he had frequently discussed the matter with General Scott, he had not yet heard that the plan was a success. An apparently clear effluent was produced, but at a great expense, and he was not sure that a sale could be found for the cement. He was in favour of small sewers, if good flushing could be depended upon; but this was often exceedingly difficult to obtain, as the lowest parts of sewers were laid to a flat gradient.

Dr. G. V. POORE deemed Professor Kerr's plan of an annexe a good one, but could not see any reason why it should not be brought to the front and treated æsthetically. The last speaker appeared to doubt if there was a connection between sewer-gas and fever; but some three or four years since he saw a boy at a master's house in a public school who was dying from inflammation of the lungs. Finding that another boy had died, and others had suffered from similar symptoms, he examined the drainage, and found that near the boy's cubicle of the dormitory was a sink. This passed outside, and was said to be disconnected; but examination showed that the intelligent builder had connected the waste-pipe to the mouth of soil-pipe, so that the boy had been sleeping with his nose over a cesspool. In reference to Professor Lewis's suggestion that the sulphur and carbon in the air destroyed the germs of disease, he would point out that the proportion of those antiseptics was at any time very small, and he doubted if any respirable air was sufficiently charged with those substances to affect the germs.

Mr. WILLIAM WHITE, F.S.A., thought Mr. Robins's paper ought to have been confined to matters affecting architects. At the recent sanitary congress at Exeter there was a strong desire apparent on the part of several persons to affix the responsibility for defective sanitation on architects, but the attempt completely failed. He carried out in his own house very nearly the plan suggested by Professor Kerr, but there were obvious reasons why he had placed the annexe at the back and not next the street. He had brought the 4in. soil-pipe down to the basement in a 9in. shaft, and provided open-ventilation at the bottom and top; these were inside the house, but had no communication with it. Experiments showed that the current in his soil-pipe was always upward, even during a thick fog and with a low temperature. He attributed

the success of the shaft to the fact that it received the warmth of the house. Mr. Woodhead, of Leeds, and others, declared that there would always be a down-current in ventilated soil-pipes, but he had not found it so. A serious matter was that there were so many diverse opinions upon all sanitary matters, and the whole range of sanitary science was at the present moment in so tentative a condition that it was not easy to decide what was correct and what wrong. In consequence of this, people were undecided in reference to many points laid down as infallible by reformers. At the recent Sanitary Congress they were told that the old pan-closet was the best thing, but that it ought to be burnt out once a year—a pleasant idea for plumbers, but not for householders. How could sanitary reformers expect to influence the public when they heard so many different opinions advanced, and when they saw advertised in their journals side by side very bad and very good contrivances both supplied by some of the best makers in the kingdom?

Lieut.-Col. JONES, V.C., of Wrexham, said he had regretted to hear the remarks of Professor Corfield in the first evening's discussion, exaltiing science and spécialité at the expense of the public, and speaking as if householders who acted on their own responsibility, and to the best of their judgment, must come to grief. He had himself had considerable experience in rectifying the drainage of mansions, and had always experienced great assistance from talking matters over with the occupiers and with their servants. The aim of sanitary reformers should be to spread the knowledge of the very simple rules of health that it was desirable to get as much oxygen as possible by a free circulation of air. There was a great danger of darkening counsel by words. If people were incessantly to be told that they must call in the "prince of sanitary engineers," as some gentleman had been entitled elsewhere, the cause of sanitary science would not make much progress.

Mr. DAWSON moved the adjournment of the discussion, which was agreed to, the President announcing that its resumption would take place on the 14th February.

"BUILDING NEWS" DESIGNING CLUB.

A BLOCK OF ALMSHOUSES.

SEVERAL creditable designs have come to hand for this subject, though we are unable to say that any author has proved fully equal in plan and external treatment. (1) The design which appears to us to most nearly combine the two requirements is certainly that by "Black and White," though we cannot admit it quite satisfies our ideas of concentration or compactness of grouping. The author shows six one-story tenements on one frontage and two on the other. The frontage of each house is 22ft. There is to each a recessed porch with a seat, an inner-lobby, taken out of the living-room 12ft. by 10ft., a small bay-window, a bedroom, 10ft. by 9ft., also in front; and behind, leading out of living-room, scullery with coals and pantry, an enclosed yard, and an earth-closet and dust-bin. The external porches are placed in pairs, and the author has cleverly combined them by a wooden arcaded treatment which is made to stop against each pair of adjacent bay-windows. These also are made features of the elevation; they are simply square in projection, and have gables, which are made to break the main roof. It would have been more economical to have reduced the frontage and have placed the bedroom behind; but, taking the arrangement as it is shown, we find each tenement to be convenient in its internal planning, suitable for either an old man or woman, and self-contained in the back-offices. The rooms are shown 8ft. high, hollow walls are proposed, and the general treatment is plain and suitable. The least satisfactory part of the plan is the corner, which might have been managed more artistically. The seat in the bay-window is useful, and the position of doors is well considered. (2) "Nemo" has also a good plan, based on a similar principle of arrangement, the tenements being one story high, with a living-room and bedroom, one on each side of a lobby-entrance, though frontage is taken up unnecessarily by the 3ft. entrances which are obtained independently of the rooms, instead of being placed together and taken out of the rooms, as in the former case. The block is in one row of six houses, the end ones being intended for two persons, which would be a desirable method of reducing cost, and the author has thus been able to dispense with a return-block. The objection to the plan is that it is only one room deep, nearly all frontage—not the best form of building for comfort or warmth. Another defect is that the bedroom forms a distinct apartment, not communicating with the living-room, but separated from it. In almshouses and cottages; the great point to bear in mind is the reduction of labour in cleaning, and the principle of intercommunication becomes not only admissible, but desirable. Distinct and separated rooms entail labour in attendance, fuel is wasted, and comfort, especially of old folk, sacrificed. The author shows a tub-closet to each house. In elevation the block is suitably treated, with bay-windows and gabled centre and ends, in a plain brick Old English style. (3) "Such a Dog" shows a more economical plan, with a well treated elevation in brick-and-timber work that would make an artistic block; but we find fault with some points of detail. The porches are recessed and taken out of the rooms of each pair of cottages; there is a small pantry in a convenient position, with small windows opening into porch; but the scullery is cramped, and would have been best placed outside, while one water-closet to each pair of houses is not desirable; added to which, the position is objectionable. The corner-house is squeezed up unnecessarily, and its offices placed in an unsuitable position. (4) "Cui Bono" sends an ingenious plan contrived in a small compass and depth. Each entrance-porch is common to two houses. There is a living-room 12ft. by 11ft on either side, a small scullery with fuel-bunker common to both, and the bedrooms, except at the ends, are arranged in pairs between adjacent houses, so that the front bedroom belongs to one house, and the back to the next. Each water-closet, besides scullery and fuel-store, is shared between two tenants; but to this arrangement we demur, as elderly people, once in better circumstances, who are forced by adversity into these domiciles, have a right to expect regard for their individual comforts in such matters. The design is simply and suitably treated externally. (5) "Jack" has produced a characteristic stone treatment of one story, with some good features, separate entrances are provided. The bedrooms are arranged to be lighted from the front, but the separate lobby entrance to them is unnecessary, and the aim the author seems to have had in view is to get all the accommodation in a depth of 14ft. 6in. The living-room is 14ft. 6in by 12ft. 6in; but we do not think the recessed fireplace a good plan in rooms of this kind. One w.c. is placed to two houses. (6) "Nitor" is another single-story arrangement; the author has divided the blocks, one being for men and the other for women. The plan, like others we have named, is shallow in depth; but the living-room, 20ft. by 13ft., is too large, and the bedroom is reached in the same manner as the last described. The pantry on the men's side answers for a scullery. The elevation is pleasingly simple and well adapted; the gables and intervening porches are effectively combined, and made to break the roof along the frontage. (7) "Beta" shows a row of small houses, two stories high, in a trim Queen Anne style. Each house has an entrance leading into a large living-room, with scullery and pantry at back, and two bedrooms over; but the treatment partakes more of a row of small tenements than a block for aged people. (8) "Peace" adopts an economical plan, though rather ill-digested. The living-room, or kitchen, 12ft. 6in. by 12ft., opens into a bedroom 8ft. 3in. by 10ft., one being arranged in front, and the next behind. The pantry and scullery are combined; but there is only one w.c. to a pair of houses. The elevation in half-timbered work is rather ornate. (9) "Edgar." This is a two-storied block, comprising four dwellings on each floor. A common entrance and stairs is provided for the four houses; the bedroom is small, and only one closet shown for two; the arrangement otherwise is compact, and the elevation plain, though rather uncharacteristic. (10) "Lex" is a plan which shows study, but is rather too elaborate. Two-storied blocks for able-bodied men and women form centres in the two respective frontages, the single-story dwellings being devoted to old people. The scullery is reduced to the size of a pantry with a sink; but the objection is the distance of the living-room from the bedroom. (12) "Pupil J." sends a compact block of four dwellings, two stories high, which has the resemblance of a country inn rather than a block of almshouses. The sexes are divided; each tenement has a living-room, with bed recess and pantry; a scullery and w.c. in rear; but the arrangement, if self-contained, lacks room, and there is no distinct outlet to each house, which seems dssirable. "Black and White" (No. 2) divides his block into four parts, two tenements being set apart for married couples, two for males, two for females, and the end tenements for one of either sex. The plan of each tenement shows a chimney-corner to the fireplace which, though cosy, rather cuts up the room; the scullery and pantry are behind, and the bedroom on one side; the houses thus interlap in some cases. Elevation is in a fanciful Jacobean style. "Weaver" arranges his bedrooms in the roof, lighting them by back dormer windows. In this manner he economises area, but the scullery and yards are cramped, and the stairs too narrow and awkward. We do not like the manner the two separate blocks join at the corner. The porches and seats are well-managed and made external features, hipped back to roof. "Arnold" designs a compactly-planned block, or rather two blocks, one being intended for men (two stories) and the single-story block for women. The living-room and bedroom are arranged *en suite*, and there is a common front and back entrance to each pair. The pantries are well-contrived between the dwellings in the women's block; fuel-stores and a wash- and bake-house (the latter in the women's yard) are provided in the rear. External elevation is half-timbered Gothic; drawings are neatly executed. "Snow Flake" is a clever one-story arrangement; the porch and bay window of each tenement is made a projection, and hipped back to main roof; the elevation is neat, in a rather prim style, the details lacking character. We can only pass in rapid review several other designs of merit, but which have lost sight of the primary idea of compact planning and appropriate treatment and grouping. Amongst these we must place "Frank," an arrangement with a canted corner occupied by two dwellings, the bedrooms being obtained in an upper story, clever, but intricate, in the offices; "Bonus Hominus," too costly in character, also planned with a canted corner dwelling; "Hexagon in Circle," a two-storied arrangement in half-timber work; "Clarior e Tenebris," two stories, expensive in style, and more suited for a small villa; "Rex," awkward in planning, and not characteristic in style; "Fortes fortuna juvat," too ornate, with wasted passage-room and cramped scullery; "Endymion," pleasingly grouped and artistic, but not convenient bedroom approach; "Ralph," fairly planned and artistic, but crude in drawing; "Noel," scattered and disjointed in the rooms; "Ambition," "Kismet," bad position of bedroom; "Juvenis," ill-contrived doorways, and too costly exterior; "En Avant," corner arrangement of offices faulty, and uneconomical in entrances, &c. Of other designs which miss the purpose of almshouses, and are meagre and unsuitable in detail, we can only name Sub Judice, B. J., Kairon in Circle, Trial, Norman, Good Luck to your Fishing, Nil Desperandum, Edmund, Lancaster, Utile Dulci, Motto A.

The designs sent in for lectern and font-cover are few and disappointing, leaving us no choice for selection. "En Avant" is the best of the three, though the details are poor. We have received also "Con in Circle," whose design for a lectern shows an enormous stem, with an absurdly small desk. The four struts leaning against the octagonal base have a meaningless appearance, and we can hardly appreciate the artistic value of such appendages. The fleur-de-lis on the font-cover, in stamped leather, are also drawn without reference to the axes or lines of angle-ribs; the details are below par. "Nil Desperandum" No. 2 sends a sheet of more elaborate designs, of the quality of which we forbear to say more than that we are at a loss to know what style they are supposed to be drawn in. The draughtsmanship also is not faultless.

METROPOLITAN BOARD OF WORKS.

AT the meeting of this board on Friday, the Right Hon. Henry Fawcett, M.P., accompanied a deputation, and addressed the board with reference to a memorial presented by the Committee for the preservation of Kings-

land-green, asking that this open space, about an acre in extent, may be maintained as a place of public recreation. There was also a memorial from the Vestry of Paddington, complaining of the sinking by Mr. Brass, builder, of basements to certain warehouses in Queen's-road, Bayswater, to a greater depth than sanctioned by the vestry. A report was presented by the Works Committee, relative to the amendment of the Artisans and Labourers' Dwellings Improvement Acts, and submitting a sub-committee's report and return on the subject, which the committee had been directed to forward to the Home Secretary. The return showed that fourteen schemes had been instituted. In four cases, the schemes for Whitechapel and Limehouse, for Bedfordbury, for Great Wild-street, and for Old Pye-street, the sites had been entirely cleared of buildings, and possession given to the Peabody trustees, under the agreement for sale, and in all but the last case, the new dwellings were in course of erection. The Great Pear-court area had been, and that in White-cross-street was being cleared, and possession would, in both cases, soon be given to the Peabody trustees. In the areas of Goulston-street, of St George the Martyr, of Essex-road, and of High-street, Islington, the final award had been issued, and in the remaining schemes, those of Bowman's-buildings and Wells-street, Poplar, were before the arbitrator; and in those of Little Coram-street and Great Peter-street, claims were being sent to the Peabody trustees. Up to the 30th November last, 9,538 persons had been removed, and 13,126 persons remained to be displaced. The total cost had been £824,497, and a further outlay of £847,871 was anticipated, making a total of £1,166,372. Towards this, £355,894 would be probably recouped, and £80,036 would be saved in the Little Coram-street and Great Peter-street schemes, where the total cost, except about £10,000, would be paid by the Peabody trustees. The nett cost to the ratepayers of the fourteen schemes would then be £1,225,442. The sub-committee reported that they had arrived at the conclusion that no mere amendment of the existing Acts on the lines hitherto followed would avail to render their operation within the metropolis satisfactory, they being both unnecessarily dilatory and costly, and that nothing short of a complete alteration in the whole method of procedure would effect the object in view. In any new enactment the Board should be empowered to draw up plans of unsanitary areas to lay before the Home Secretary. A Government inspector should then hold an inquiry, on oath, in the district, and the Home Secretary should have the power on his report to authorise the Board to acquire all interests in the property. The Secretary of State should also have full power to allow the Board to appropriate any portion of the areas purchased to commercial and other purposes. With regard to the abatement of nuisances, the Board should be appointed the authority for the metropolis, and all expenses should be paid out of the metropolitan consolidated rate. An official referee should be appointed, before whom the owners of unsanitary property should be summoned, and the referee should have the power of ordering that the property be closed within one month if not fit for habitation. Within six months the Board should have the power to remove such property if it still remained unfit for habitation.—The report was approved. It was agreed to enter into a new agreement for the erection of other buildings, instead of an opera-house, on the site between Cannon-row and the Victoria-embankment. A letter was read from Mr. C. Forster Haywood, district surveyor for St. Gile's-in-the Fields, requesting the Board to afford him legal assistance in obtaining the removal of wooden hoarding in front of a house used for advertising purposes, and was referred to the Building Act Committee. It was decided to erect a new fire-brigade station on land belonging to the Board in Great Scotland-yard, adjacent to the building of the Christian Knowledge Society, in substitution for the present station in Chandos-street, reported to be small and inconvenient.

WEB STRAINS IN SIMPLE TRUSSES.

THE current number of the *Transactions* of the American Society of Civil Engineers contains an interesting paper by Elnathan Sweet, member, on "Web Strains in Simple Trusses, with Parallel or Inclined Booms." The author claims to investigate, by a more correct method, the strains in braced structures, than those given in the usual handbooks. The ordinary method of determining the maximum effect of a moving load upon web measures of trusses, "assumes that as the moving load passes over them, each panel is fully loaded before the adjacent triangle in advance bears any part of the load." In single systems of triangulation, this assumption is regarded as erroneous, for the "instant the head of the load passes a panel-joint of such a truss, a part of it is transmitted by the floor system to the adjacent triangle." The author then proceeds to investigate the maximum vertical stresses produced by uniform moving loads in trusses of this kind. Trusses divided into panels of equal length are readily calculable, as the panel-length becomes a convenient unit, and if, in designing the truss, the height and the panel-length are made to have a simple numerical ratio, the panel-length unit facilitates the calculations. The author shows by diagram the mode of finding the greatest shearing strain at any panel-point, and he proceeds to investigate analytically the subject and the stresses on the diagonals. The maximum shears having been found by an equation, the graphical method is applied to determine the resulting stresses in the web members, a method rapid and direct. The author works out a strain sheet for a wrought-iron bowstring girder 90ft. span, with a clear roadway of 18ft., and two sidewalks 6ft. wide, having a rise of 10ft. The arch is supposed to be in the points of a curve of equilibrum, divided into 9 panels, the moving load assumed being 80lb. per sq. ft. of floor-surface, the uniform dead-load of the truss being 400lb. per lineal foot, and of its arch 75lb. The diagram of the frame is drawn to a convenient scale with the diagonals required to transmit the panel-weight to the abutment. The force polygon is drawn to a scale of 10,000lb. per inch. This resolves itself into a very simple figure of radial lines, the vertical line representing to the assumed scale the whole dead and live load. This line is subdivided into eight equal parts (the number of loaded panel-points), and through the points lines are drawn parallel to the several members of the arch, intersecting at a common point. These represent, in direction and magnitude, the stresses in the members of arch to which they are respectively drawn parallel. The horizontal line represents, to the same scale, the stress in the lower chord and horizontal members.

The other subjects discussed are inter-oceanic canal projects, with additional information obtained from recent surveys in Nicaragua, giving maps of proposed canal routes between that lake and the Pacific Ocean, with profiles or sections of the canal, besides minutes of meetings, and reports on uniform tests of cement.

THE LONDON INTERNATIONAL MEDICAL AND SANITARY EXHIBITION, 1881.

THIS exhibition, which has now been definitely entered upon by the Committee of the Parkes Museum of Hygiene, will be held at South Kensington, from July 16th to August 13th, inclusive, Her Majesty's Commissioners of 1851 having granted space for it in their Exhibition buildings. The Medical Congress, which holds its seventh session in London in August this year, has given its cordial support to the undertaking; but the Exhibition Committee have decided not to make any appeal to the medical profession to join in the guarantee-fund, on account of the heavy expenses which the members of the profession must incur in connection with the Congress. All others who are interested in the progress of medical and sanitary science will be appealed to to subscribe to the guarantee-fund, of which the first list, amounting to £655, has just been published.

At a meeting of the Exhibition Committee on Wednesday (Jan. 19) the classification was decided upon as follows:—

MEDICAL SECTION.—1. Surgical Instruments and Apparatus. 2. Appliances of the Ward and Sick-Room. 3. Drugs, Disinfectants, Medical Dietetic Articles, and Mineral Waters. 4. Electrical Instruments and Appliances. 5. Microscopes and other Optical Apparatus. 6. Apparatus of other kinds used in the Investigation of Disease. 7. Appliances used for the Treatment of Sick and Wounded during War. 8. Appliances used in Teaching Medicine; Books, Diagrams, Models, &c.

SANITARY SECTION.—1. Domestic and Hospital Architecture. 2. Planning and Construction. 3. Ventilation, Lighting, and Warming. 4. Water-closets, Sinks, and Baths. 5. Sewerage and Drainage. 6. Water Supply and Filtration. 7. Health Resorts and Sanatoria; Books and Diagrams. 8. Miscellaneous.

All inquiries and communications respecting the Exhibition should be addressed to the Secretary, Mr. Mark H Judge, Parkes Museum of Hygiene, University College, Gower-street.

THE RUINS OF RABBATH AMMON.

IN his new book, "The Land of Gilead," Mr. Laurence Oliphant gives a graphic description of the ruins of Rabbath Ammon as follows:—

For picturesqueness of situation, I know of no ruins to compare with Ammon. The most striking feature is the citadel, which formerly contained not merely the garrison but an upper town, and covered an extensive area. The lofty plateau upon which it was situated is triangular in shape: two sides are formed by the wadies Nuegis and Hadeidah, which diverge from the apex, where they are divided by a low neck, and thence separating fall into the valley of the Jabbok, which forms the base of the triangle, and contained the lower town.

Climbing up to the citadel, we can trace the remains of the moat, and crossing it find ourselves in a maze of ruins. The massive walls—the lower parts of which still remain, and which, rising from the precipitous sides of the cliff, rendered any attempt at scaling impossible—were evidently Ammonite. As I leant over them and looked sheer down about 300ft. into one wady, and 400ft. into the other, I did not wonder at its having occurred to King David that the leader of a forlorn hope against these ramparts would meet with certain death, and consequently assigning the position to Uriah. The only possible point from which that officer could have advanced was at the apex where the low neck connects the citadel with the high plateau beyond, but even here he would have had to charge up an almost hopeless escarpment. This is confirmed by the account of Joab's messenger to David describing the incident, who says, "We were upon them even unto the entering of the gate. And the shooters shot from off the wall upon thy servants; and some of the king's servants be dead, and thy servant Uriah the Hittite is dead also." (2 Sam. xi. 23, 24.) Portions of this colossal gateway, and the massive wall flanking it, at the point where the low neck joins the apex of the triangle, still remain to attest the truth of this narrative, and to identify the spot where Uriah met his fate. Joab afterwards took the lower city, which he called "the city of waters," indicating very probably that the Jabbok was dammed into a lake near the lower city, to which the conformation of the valley would lend itself; but that the citadel still remained, and was upon the point of being taken, doubtless because its water-supply was cut off, and the provisions, after a siege which must have lasted nearly two years, had become exhausted. So David arrives to take part in the final capture of the citadel, and avenges their pertinacious resistance by putting "the people that were therein under saws, and under harrows of iron, and under axes of iron, and made them pass through the brick-kiln." (2 Sam. xii. 31.)

The citadel in all probability contained a temple to Molech "the flame-god," who was the supreme object of Ammonite worship, to whom they offered up human sacrifices; and the brick-kiln here alluded to may be conjectured to have been literally the "burning-place of Molech," where sacrifices were offered, and the children of Ammon made their sons pass through the fire. Perhaps where the temple of Molech once stood the Romans reared that magnificent edifice, the ruins of which still remain to attest its grand proportions; it faces to the east, and was doubtless dedicated either, like that of Baalbec, to the sun, or to Hercules. In either case the religious idea was closely allied to that which is embodied in the worship of Baal and of Molech. The foundations of this temple were about eighty yards by forty, and its façade was composed of four colossal columns the pedestals

of which are still standing, while the columns themselves, measuring about five feet in diameter, are prostrate at their base. Not far distant is what appears at first to be a square tower, but it is in reality a very perfect specimen of a Byzantine church, the external walls of which measure about seventy-five feet each way, and are comparatively in good preservation. The carving and ornamentation inside are very beautiful, but three of the arches which formed recesses have been built up, leaving only one by which it may be entered. Near it was a building which seems to have been a mosque; and there can be little doubt that, though we have no evidence of its ever having been permanently occupied by the Turks, the Arabs have from time immemorial made temporary habitations here, and had a place of worship. It is possible that the massive square tower may have been once a central keep, which was converted by the Byzantines into a church. The columns of another temple were still standing, and near them was an old tower still in a sufficiently-good state of repair to be inhabited by a Circassian family. The citadel seems to have been largely dependent on the lower town for water, o judge by the accounts of its sieges; but there an be doubt that numerous subterranean assages to the valley of the Jabbok existed—the calcareous nature of the rock offering peculiar facilities for excavations of this nature. One cistern, which I measured roughly, was eighty yards in circumference, and about thirty feet deep; and I also saw the remains of a well. The view from the citadel was neither very extensive nor interesting, beyond affording one a bird's-eye view of the ruins in the valley below; the rest of the landscape was so nearly on a level with the fortress that it was somewhat circumscribed. No trees were visible in any direction; and the rolling prairie, though affording good pasture, was bare-looking enough. The hillsides in every direction were honeycombed with caves, which, in former days, doubtless formed the dwelling-places of a very considerable population. Some of these under the citadel apparently extended for some distance, but we had neither the time nor the lights to enable us to explore them.

It would take days to do justice to the ruins of Ammon; notwithstanding the examination to which they have already been subjected, there can be little doubt that a little excavation would unearth interesting results; and that under the heaps of *débris* that strew the valley lie buried antiquarian treasures. The stream, now alive with fish, once evidently flowed between massive masonry embankments, and in places was covered over, for the single arch which now spans it has rather the appearance of having once formed a portion of this tunnel than of a bridge. Near it stand the lofty walls of the grand basilica, its arched entrance leading into a court, now grass-grown, where once the worshippers assembled.

A GUIDE TO THE CATHEDRAL CHURCH OF GLOUCESTER.

THIS is a second edition of the guide-book, published in 1867, by the Rev. H. Haines, M.A., which has been revised and corrected up to the present time by Mr. F. S. Waller, architect, F.R.I.B.A. The present edition has been illustrated with plans and sketches by Mr. Waller, who has introduced several new paragraphs, giving particulars of important additions that have been made to the cathedral since the first issue. These have been introduced into the body of the text, and are distinguished from Mr. Haines's work by marginal letters. The historical notes and chronological table of the dates of the kings and abbots, with the brief descriptions of the various styles, will be found very complete and useful to the archæological student. Thus we have, in one tabular view, the Anglo-Saxon and Norman parts described. Of the work of Aldred, who rebuilt the cathedral in 1058, no remains are left, but the Norman work of Abbots Serlo, Peter, Godeman, Walter de Lacy, and their successors, the crypt, main walls, piers, and round arches, vaulting of north aisle, flanking turrets of transept (except their spires), chapter-house, and abbot's cloister yet exist. The isometrical sketch introduced by Mr. Waller is an important illustration, and shows the remains of the old Norman church as it existed in the 12th century, which have now been encased with additions of later centuries. In the view all these additions have been removed, so that the visitor or student may see at a glance the existing parts of the old Norman church of the 12th century. Mr. Waller, in the appendix, makes some useful comments upon this sketch. He shows that the builders who made additions subsequent to the 12th century, made use of the old Norman foundation without misgiving. "The original Norman tower," says the author, "was probably somewhat similar to that at Tewkesbury Abbey, and might have been about one square in height above the apex of the then roof of the choir. This tower was taken down, and in the 15th century the present tower was erected, of much less thickness of masonry, no doubt, but of at least double the height, as measured from the choir-roof; and the whole of it is borne on the original 12th-century foundation, assisted, it is true, by flying buttresses carried skilfully and with great picturesque effect across the openings in the transept-walls." Another instance of re-use was the casing of the choir in the 14th century. The remarks on the Perpendicular casing of the Norman choir have been made very intelligible to the general reader by the sketch given, showing the method of casing adopted by the 14th-century builder, and the way in which the circular Norman pillars were cut down in front, and the Perpendicular shafting introduced. When the Later work overtopped the Norman walls, these latter afforded the base for the Perpendicular buttresses which assist to carry the choir vaulting. The plan of the precincts shown in outline give the positions of the cloisters, the gateways, Roman wall, &c.; while the larger sketch-plan of the cathedral is sufficient to afford the visitor every particular. The addition of the sections indicating the relative levels of the nave and choir is also of value. It appears that the Norman mortar is yellow in colour, with only a small proportion of lime, and this imperfectly incorporated with the sand, and very friable, while the mortar of later periods is hard and good, and very white, as the lime has been well mixed. Of course, in every part, the Norman stone has been reworked and introduced into the masonry.

Referring to the chapter on "Chief Points of Interest," we find some interesting notes added about the south porch and its statues; the new granite font in the south aisle by Sir Gilbert Scott, executed by Farmer and Brindley; the new reredos, also erected from Sir Gilbert Scott's designs; the restored sedilia, &c. The description of the various painted windows forms another chapter, in which reference is made to the wall-paintings executed by Mr. Gambier Parry in his "spirit fresco," in 1866. Chapter V. describes the ancient paintings of the Last Judgment, discovered on the east wall of nave in 1718, and other remains in the vaulting, which are detailed by Mr. Waller. Notes on the old destroyed parts of the monastery have been added, which considerably enhance the value of the hand-book, and make it one of the most perfect we know of the kind.

THE SOUTH KENSINGTON DRAWING-BOOK.*

THE excellent series of drawing-books, issued under the sanction of the Committee of Council on Education, will be welcomed by all who are endeavouring to impart sound principles of instruction to art students, especially in our ordinary schools. For a long time schoolmasters have been left to their own resources to furnish suitable copies to their pupils, and we know what, as a rule, these copies generally are. Professor E. J. Poynter, R.A., the director for art, has, in the books we are noticing, selected progressive examples of some of the simpler and more popular class of subjects, chiefly taken from the Kensington Museum. The books on elementary freehand ornament consist of elementary forms common to ornament of all periods, though chiefly taken from a collection of Japanese design. Many of the former are of a purely geometrical character, beginning with simple squares and triangles, and other rectilinear figures, and proceeding to forms with curves, floral and other designs conventionalised. The two books published, if followed by the pupil, will give him a good insight into the composition of ornament in its simpler elements. The guiding outline and means of setting out by the eyes are indicated by faint dotted lines, and cannot fail to train the eye of the pupil to the delineation of curved and symmetrical figures.

The books on Freehand, first and second grade, contain examples selected from the Museum, and are arranged with considerable discrimination, so as to afford not only instruction but interest to the student. We have before us six books of the first grade, and we find that the subjects vary considerably in kind and degree of difficulty, so as to meet various tastes and capacities. Thus, in the first book, there is the simple outline of a sixteenth-century house, certainly not a very good model, but useful to train the eye in dimensions and proportions; next come heraldic shields, a Greek fret in the simplest form, a woven pattern intersecting Arabian patterns; in the second book are a few very excellent outlines of pottery, old English silver candlesticks, coffee-pots, Japanese fans, &c., each subject having its title given and the date. In the next book, the Eddystone lighthouse, varieties of ornament in outline, such as the fleur-de-lis, and some good outlines of Greek ornament and vases are given; these are followed by more decided varieties of architectural ornament, as the guilloche, the patera, the anthemion, acanthus foliage, Greek and Italian ornament. Some very elegant fictile forms appear in Part V., many of them taken from Greek, Chinese, and Italian examples; and domestic objects, furniture, &c., are given in Book VI.

A few instructions are appended to each book, in which it is advised that "measuring should not be resorted to unless to test the accuracy of the drawing after the copy has been made." The forms are intended to be lightly sketched in at first, after the centre or guiding lines are fixed, these being indicated in all the examples. We may add that not the least useful feature of these copybooks is that the examples are placed on the pages so that the pupil may copy them underneath, or on the next page, to a larger scale; the paper is a fine cartridge, well adapted for drawing on, and the examples are well printed. All the drawings have been made by pupils of the National Art Training School—a sufficient guarantee of the character of the copies.

* The South Kensington Drawing-Book; issued under the direction of E. J. POYNTER, R.A. London: Blackie and Son, publishers.

BOOKS RECEIVED.

Popular Lectures on Scientific Subjects, by H. Helmholtz, translated by E. Atkinson, Ph. D., &c. (London: Longmans and Co.) is one of the most useful books of its class we have ever seen. We especially direct attention to the 3rd lecture "On the Relation of Optics to Painting."——*Rules for Engine Drivers*, compiled by M. Powis Bale, M.I.M.E. (London: Wyman and Sons) is a handy, comprehensive, and accurate sheet of instructions, which should be hung in every room where an engine is at work.——*Engine Driving Life*, by Michael Reynolds (London: Lockwood and Co.), will be read by railway men and all desirous of knowing what the life of the engine-driver is. Some of the episodes are quite dramatic.——*A Descriptive Account of the Recently Discovered Villa near Brading, Isle of Wight*, by Cornelius Nicholson, F.G.S., F.S.A. (London: Elliot Stock), will be read with interest by all archæologists.——*Tuning and Repairing Pianofortes*, by Charles Babbington (London: The *Bazaar* office) seems a useful treatise, so far as we are able to judge.——*A Complete Course of Problems in Practical Plane Geometry, &c.* New and enlarged edition, by John William Palliser, late Second Master of Geometrical Drawing at the Leeds School of Art, &c. London: Simpkin, Marshall and Co. —A complete course of problems in plane geometry, intended for the use of students and others preparing for the examinations conducted by the Science and Art Department in the different grades, with an introduction to elementary solid geometry, has been brought out by Mr. John William Palliser, late second master and lecturer on geometrical drawing at the Leeds School of Art and Science The new and enlarged edition before us is published in a cheap form (price 2s.). The pages are bound as in a drawing-book, and each page, ruled into four columns, includes the diagrams and their solutions. This arrangement saves time to the learner and teacher, for the definitions and pro-

blems are well classified in sections, under particular heads. Thus we see right lines and figures, circles, measurement of angles, proportionals of lines, ellipses and curves, &c., separately treated. The diagrams, we find, from a general glance at the pages, are accurately engraved, and the working lines are shown, which is a great help to the beginner. A glossary of terms, and the elements of solid geometry, will be found useful, and the book very serviceable, by all artizans and students who may wish to have a complete text-book to assist them to prepare for the examinations in the first, second, and third grades. ——*Street's Indian and Colonial Mercantile Directory for* 1880-1 (London: G. Street and Co., 30, Cornhill, E.C., and Street Brothers, 5, Serle-street, 1880), in addition to the trade returns, tariffs, population, &c., contains full particulars (with rates and times of transit) of the steam and other communications with the various places treated of, wherever anything like a regular mode of conveyance or correspondence exists; and the average time of transit by sailing vessels is also given. The leading merchants and traders of every class, likely to be of any use to manufacturers and all engaged in commerce, are fully enumerated, together with the leading professional men—*e.g.*, physicians, surgeons, solicitors, &c. Concise descriptions of each country and town are furnished, with a view more particularly to show their commercial capabilities and peculiarities. The principal products, and details as to the articles of which the trade returns chiefly consist, will also be found; also tables of the local weights and measures, and the value in English money of foreign coins. The number of towns and cities has, we notice, again been increased. The new places include Montevideo, Winnipeg, Lagos, Aden, and several minor but not unimportant commercial towns. Maps are given of all the principal countries of which particulars are furnished in the letter-press. The work is certainly indispensable to every merchant, manufacturer, and exporter.——*Laxton's Price Book for* 1881. (London: Kelly and Co.), is issued for the sixty-fourth time, carefully revised and corrected, with much new matter added. We note especially a new section on p. 242, devoted to sanitary work; the work undoubtedly maintains its old position as the acknowledged standard to which in disputed cases in the various law-courts reference is made.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—An ordinary meeting was held on Tuesday evening week at the Rooms, Queen's College, under the presidency of Mr. R. B. Morgan, chairman of the association. After the business of the meeting, a paper on "Decoration" was read by Mr. W. H. Kendrick, of West Bromwich.

LIVERPOOL ARCHITECTURAL SOCIETY. — The fourth meeting of this society was held at the Royal Institution, Colquitt-street, Liverpool, on Wednesday evening, Jan. 12, the president, Charles Aldridge, F.R.I.B.A., being in the chair. After the usual routine business, the secretary announced that the sub-committee appointed to go into the merits of the measured drawings of the north vestibule of St. George's Hall, submitted by the students as recess work, had reported to the council that, in their opinion, those by R. Holt were the best, and those by C. R. Chidson, were second; they also highly commended the drawings sent in by J. H. Havelock Sutton. The council had approved of the award of the sub-committee, and the prizes would be given accordingly. The death of Mr. George Goodall, one of the oldest members, was announced, and a vote of condolence with his widow was passed. Mr. Samuel Huggins, also a very old member, who had sent in his resignation, owing to ill health, was elected an honorary member. Mr. J. W. Gibbs read a paper on "Domestic Sanitary Economy," illustrating it by means of large plans and sections, showing a thorough system of warming, ventilating, and draining on Boyle's system, and also by chemical experiments. A meeting of the students' class of design and construction was held, previously to the ordinary meeting, when a large number of designs for "a small stable" were handed in. Mr. Arthur P. Fry was the visitor for the evening.

SCHOOLS OF ART.

ROYAL ARCHITECTURAL MUSEUM.—The annual meeting of this school of art was held on Wednesday evening, Mr. J. P. Seddon occupying the chair, in the absence, through illness, of the president of council, the Right Hon. A. J. B. Beresford Hope, M.P. The chairman congratulated the students on the continued success of the School, both in numbers and in results at examinations. There were last session 92 members of evening-classes, 37 of the life class, and 12 of the ladies' class, making a total of 141 students. The numbers had gradually augmented, till it had become necessary to provide more accommodation. Alterations were consequently being made to the premises, by which a new antique room would be provided, and accommodation provided for an additional modelling-class. During the session the lease had been purchased at a cost of £500, so that the museum is now held directly from the Dean and Chapter of Westminster, with half-a-century to run, at £80 per year. He congratulated the students that, for three years successively, they had carried off one of the Plasterers' Company's prizes; the 2nd prize by Walter Allan in 1878, and the 1st prize in 1879 by Andrew Garbutt, and again in 1880 by William Kitson, who, like the prize-taker last year, had also been awarded a gold medal at South Kensington. The Chairman mentioned that the Council had been hampered by the smallness of their funds, and appealed for additional subscriptions. In connection with the museum sketching-club, the council offered a prize of five guineas, and the curator a second prize of two guineas, for sketches, in chronological order, of ornament illustrated by examples in the museum. He then distributed the prizes, including the Science and Art Department's gold medal and Plasterers' Company's 1st prize of £7 to William Kitson, for a modelled design of picture-frame in ceiling; Department's silver medal to F. K. Brown, and books instead of silver medals to W. G. Thomas and W. Catchpole; three national book prizes in the 3rd grade, and in the 2nd grade six book prizes and three certificates. In the museum sketching-club competition, J. Coates Carter took the prize, and T. Frederick Pennington and Walter Hammond received hon. mention. The Council's prizes were divided—James Smith and J. Treleaven æq. 1st, and R. A. Bell and Geo. Lawrence æq. 2nd. The chairman also spoke in terms of high commendation of a modelled capital, of 13th-century character, by Turner, and expressed surprise that a work so full of Mediæval feeling and expression, and without a redundant stroke or line, had not met with the approval of the Department examiners. Mr. Lomax, in proposing a vote of thanks to the chairman, said Mr. Seddon was one of the earliest supporters of the museum and school of art, having actively helped and advocated it since 1853; as its first secretary he expressed his pleasure that, after 30 years' struggling, it had become successful. A similar compliment was paid to Mr. Brown, head-master, and Mr. Druce, curator.

PARLIAMENTARY NOTES.

LIGHTING THE BRITISH MUSEUM.—Mr. D. Grant, on Monday, asked the right hon. the member for the University of Cambridge, as one of the trustees of the British Museum, whether any steps had been taken towards lighting the main portions of our great national collection, so as to allow it to remain open to the public until 10 o'clock at night every week-day throughout the year. Mr. Walpole was understood to say that the trustees had considered the subject of the hon. member's question; but that to carry out the hon. member's suggestion would involve great expense and a complete reorganisation of the staff.

THE TEMPLE BAR MEMORIAL.—On Tuesday notice was given by Mr. Labouchere on that day week to ask the Chief Commissioner of the Board of Works whether it is his intention to take steps to deal with an obstruction consisting of an heraldic beast, alleged by the Corporation of the City of London to be a griffin, and elevated above two statues professing to represent Her Majesty and the Prince of Wales, which has been erected opposite the New Law Courts in the centre of a public highway.

SUPPLY OF WATER TO LONDON.—In answer to Mr. Ritchie, Sir W. Harcourt said on Tuesday, that he hoped to be able to introduce a Bill on this subject this session.

COMPETITIONS.

FOREST HILL.—Plans have, during the past week, been submitted, in a limited competition, for the New Church of St. Paul, which is to be erected at Forest Hill.

HARROGATE CONSERVATIVE CLUB AND PUBLIC COFFEE-HOUSE COMPETITION.—In a limited competition of six *Conservative* architects practising in Harrogate, the awards have been made as follows: viz., First premium, to Mr. A. Hiscoe, East Parade, Harrogate; second premium, to Mr. R. Dyson, 10, Parliament-street, Harrogate; and third premium, to Messrs. Perkin and Bulmer, Park-row, Leeds, and Harrogate. It was suggested to the directors that a professional referee should be asked to adjudicate upon the designs, but the directors considered themselves equal to the task of awarding the premiums.

PONTEFRACT TOWN HALL SCHEME.—The Corporation of this borough held another specially summoned meeting, on Tuesday evening, to consider a requisition signed by ten members, to take immediate steps in the rebuilding of the town hall, &c. The majority at the last division, when the scheme was thrown over, now proposed that the old hall should be cleared away and important street-improvements should be carried out. This was met by an amendment, that the corporation should be empowered to spend £7,000 in the erection of a new assembly-room, with surveyor's offices, and additional police-cell accommodation, to include the purchase of additional properties—the old vicarage and dispensary—and the architect's commission. The amendment was carried by 11 to 10 votes, so that virtually the original scheme will now be carried out. The £3,000 subscribed by the public will be devoted to the purchase of the old property, and the £7,000 to the building. Only a portion of the dispensary, for which the corporation has paid nearly £1,500, will now be required, and the other portion will consequently be for resale. The assembly-room it is proposed to slightly curtail in size, and also to adopt the plans of "Straight and True," with some modifications; the main front will be of brick instead of stone. It was decided to award the premiums to the two sets of plans selected as best, and to return the remainder to the competitors.

CHIPS.

The church of St. Cuthbert, at Pond, near Newcastle-on-Tyne, was recently opened. It has been erected from the plans, and under the supervision of Mr. A. R. Gibson, of Newcastle, and the fittings, including altar-rail and standards, brass gaselier and gas-brackets, were supplied by Messrs. Jones and Willis, of Temple-row, Birmingham, and Euston-road, London.

Mr. Baldwin Latham, C.E., has written to the Croydon local board of health, and also to the local newspapers, complaining that after he had entered upon, and been successful in, a limited competition for the drainage of South Norwood, another committee of the local board had advised the board to adopt a scheme by Mr. P. Walker, of which proposal Mr. Latham says, "the authorship was exclusively and solely my own," made in 1878, when a member of the local board. By the conditions of competition, £20 was proposed to be paid to each of the five engineers invited, a premium which, Mr. Latham says, was insufficient to cover the cost of surveying the district, and it was added, "the committee will not bind themselves to accept any scheme which may be offered, but in the event of the approval of either scheme as suitable for their requirements the commmittee will most probably recommend its adoption by the board."

The town council of Dover adopted on Tuesday a report and plans prepared by the borough surveyor, for the improvement of the waterworks, and decided to invite tenders from a few selected firms. The estimated cost is £7,000.

The Hackney board of guardians again discussed last week the question of employing Messrs. Lee and Smith, of Queen Victoria-street, E.C., as architects in preparing plans of the new workhouse. At a previous meeting it was stated that that firm had had a claim on the guardians for £2,000, and the clerk was directed to inquire into the truth of the assertion. In reply, Messrs. Lee and Smith wrote that they had a claim for preparing plans that had not been used; but in consideration of the kindness of the board to them, they would waive it. Some surprise was expressed by members, but it was eventually resolved to instruct Messrs. Lee and Smith to prepare block-plans for a new wing, for 300 persons, to the workhouse.

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ILLUSTRATIONS.

ALTAR AND REREDOS, ST. MARTIN'S CHURCH, BRIGHTON.—CHISWICK SCHOOL OF ART.—OFFICES AT BRADFORD.—DESIGNS FOR AN ARTIST'S STUDIO AND RESIDENCE.—SKETCHES FROM MELROSE ABBEY.

OUR LITHOGRAPHIC ILLUSTRATIONS.

REREDOS AT ST. MARTIN'S CHURCH, BRIGHTON.

THE unusual dimensions of this reredos arose from the fact that it was the desire of Mr. Arthur Wagner, who, with his two brothers, founded the church, that the east window should be kept as high as possible, in order that space might be left for an elaborate work below, such as we so frequently find in the churches in Spain. We have, however, in our own country four or five great reredoses still remaining—those at Winchester, St. Alban's, St. Saviour's, Southwark, Christchurch Priory, and in an Oxford College, and these have been followed rather than foreign examples. The total width of the chancel is 40ft. in the clear, and the height to the window is about the same. The whole is constructed of wood, and the main portion is divided by towers into three divisions. At the foot of the centre division stands the altar, 12ft. long, and above it is a series of canopied niches, with figures of the Apostles and our Lord in the centre. Above there is a slightly overhanging cove surmounted by an open carved cresting. The towers on either side contain niches. On the right we find five figures, St. Nicholas, St. Barnabas, St. Stephen, Lazarus, and St. Ann. On the left, St. Martin, St. Paul, St. Alban, St. John Baptist, and St. Elizabeth. On either side of the centre picture in the upper range are fine small niches, with figures of angels playing on various instruments. The large flanking towers, which are hexagonal on plan, display two ranges of niches towards the spectator. The tower on the right containing figures of Seth and Enoch, Noah and Job, Miriam and Moses, Melchisedec and Abraham, Isaac and Joseph, Joshua and Jonah, Hannah and Samuel, David and Isaiah, Daniel and Ezekiel. The tower on the left contains figures of St. Athanasius and St. Basil, St. Gregory Nazienzen and St. John Chrysostom, St. Polycarp and St. Clement, St. Lawrence and St. Ignatius, St. Boniface and St. Augustine of Canterbury, St. Richard of Chichester and St. Wilfred, St. Elphege and St. Anselm, St. Chad and St. Edward the Confessor, St. Dunstan and the Venerable Bede. The paintings are in a double range. In the upper row of compartments the subjects are as follows: Centre, the figure of Christ the Conqueror, triumphant in expression and crowned; below him stand St. John and the Blessed Virgin, on the left are St. Mary Magdalene and Mary the wife of Cleophas, and on the right the Good Centurion and the Penitent Thief. Then in the first panel to the left, we have St. Mark and St. Matthew, in the next and outermost, St. Luke and St. John, and behind, St. Paul with Phœbe and Priscilla. The first panel on the right of the centre contains Adam and Abel, the next Abraham, Moses, Elijah, Isaiah, and Ezekiel. The centre panel of the lower row is occupied by the Nativity with St. Joseph and St. Anna, the Infant St. John, and one of the Holy Innocents. The three kings are in the act of adoration. The panels on the right of this are devoted to the chief personages of the Old Dispensation not represented in the upper row; 1st. Judges: Joshua, Gideon, Deborah; 2nd. Priests: Samuel, Aaron, Eleazar; 3rd. Kings: David, Hezekiah, Josiah; 4th and 5th, Minor Prophets. On the left are found personages notable in the history of the Church. 1st. The Fathers: SS. Jerome, Gregory, and Ambrose. 2nd. The monastic orders: St. Francis of Assisi, St. Thomas Aquinas. 3rd. Royal Persons: St. Elizabeth of Hungary, St. Margaret of Scotland, St. Louis of France, King Charles I. In the fifth panel we come to modern times, the object being to set forth the missionary character more particularly of the Church of England, in the persons of the first bishops of her five daughter churches. In the sixth are represented modern worthies of the Church. These two panels have, in the drawing from which this illustration is made, been transposed by mistake. The small compartment, on the wings closing the lower range left and right, contains the champions of truth against Paganism: St. George, St. David, St. Andrew, St. Patrick, Judas Maccabæus, Judith, and the Three Children. These paintings were all executed by Mr. H. Ellis Wooldridge. The major part of the woodwork of the reredos is gilt. The walls surrounding it are to be diapered with tones of green; but at present the work suffers much from this very necessary part of the design not having been completed. The figures were carved at Ober Ammergau, many of them by Joseph Mayr, of whom we have lately heard so often. The reredos was carved and constructed by Mr. J. E. Knox, of Doris-street, Kennington Cross, who has just completed the pulpit and canopy, of which we hope shortly to give an illustration. The work was designed by Mr. Somers Clarke, jun., F.S.A., 6, Delahay-street, S.W., who was also the architect of the church.

CHISWICK SCHOOL OF ART, BEDFORD PARK.

THE new School of Art, now in course of erection at Bedford-park, is situated on a commanding site, having a frontage of about 90ft. in the Bath-road, almost adjoining the Bedford-park stores and church. To-day we have reproduced the plans and front elevation of the portion now being built. Larger class-rooms are proposed for erection at the rear of the present structure, and extending to the frontage secured to the site by the roadway at the back of the premises. The purposes for which the several studios are intended will be found written on the plans. The office of the care-taker commands the entrance on all sides, and the hall and staircase are arranged with a view, not only for present requirements, but for their ultimate uses when the future extension is completed. The stairs are 5ft. wide, and have teak treads. A heating-chamber is provided under the gentlemen's lavatory, and hot-water pipes will warm the entire building, excepting the master's room, where an open fireplace is to be used. The style chosen for the school is in harmony with the houses and other public buildings erected on the estate, though rather a later type of old English building, has, perhaps, been taken as a suggestion for the elevations. To secure harmony with the surrounding buildings, which are from Mr. Norman Shaw's designs, the plans for the new school of art were submitted to Mr. Shaw, and received his approval before the work was commenced. The entire building is being built in red brick, with cut-brick archways, pediments, strings, and copings, the sills and upper surfaces being covered with lead. The roof is to be covered with green slates, and the windows throughout are to be glazed with clear glass, in square quarries, larger in size really than the scale of those shown in our present elevation. The architect from whose designs, and under whose superintendence, the school is erecting is Mr. Maurice B. Adams, A.R.I.B.A. Mr. E. S. Burchett, of South Kensington Museum, is to be the head-master, in conjunction with Mr. F. Hamilton Jackson, of Bedford-park, and late of the Slade schools. The Duke of Devonshire is the president, and among the vice-presidents are Lord George Hamilton, M.P., the Marquis of Bute, Leopold Rothschild, Esq., and the Right Honourable A. J. B. Beresford Hope, M.P.

OFFICES IN SUNBRIDGE-ROAD, BRADFORD.

THESE buildings, now approaching completion, have been erected next the public stairway connecting Sunbridge-road with Miller-Gate, a position which has been taken advantage of to secure side-lighting, and also to acquire two lower stories between the different levels of the two streets, available for warehousing. The principle façade is to Sunbridge-road, a new thoroughfare, which, in course of time, must become one of the main arteries of the town. The style adopted is a free treatment of the Queen Anne period, a style not hitherto introduced into any of the buildings of the town. The main fronts are built in cleansed ashlar of uniform colour, from the quarries of the neighbourhood, Messrs. Waugh and Isitt are the architects, and the work has been carried out by local contractors.

"BUILDING NEWS" DESIGNING CLUB.—AN ARTIST'S HOME.

A RESIDENCE, with studio, for an artist was the first subject chosen for competition in this series of designs by members of our club, and already we have published the selected design.* To-day we have lithographed "Cui Bono's" design, to which the second place in the competition was awarded. In this plan the studio is on the ground-floor, which, for suburban sites at any rate, presents a difficulty not easily overcome if adjoining houses are to be erected, because the light would in that case be seriously interfered with. Trees, also, if near the studio-windows, as in "Cui Bono's" sketch, would also be much objected to by the painter. When the studio is placed on the first floor, both these difficulties are mostly to be overcome. The general arrangement of the house now illustrated is not good, as we have already pointed out. To enter the studio the staircase has to be passed under, and the way to the kitchen is far from admirable. The architectural treatment of this design has much to commend it.

MELROSE ABBEY.

MELROSE ABBEY, which the genius of Sir Walter Scott has rendered the most celebrated of Scottish monastic buildings, owed its foundation to the munificence of King David I., who, from his attachment to the Church and the frequent liberality of his endowments, is reputed to have been "a sore saint to the Crown." The original building was erected during the decade ending 1146, but of this no trace now remains. It was too near the borders of England to escape during the disputes with that kingdom. The neighbourhood was the repeated scene of warfare between the contending hosts who were

> "Keeping the rights of the border side,
> Warden to warden, and man to man."

Edward II. destroyed it during his retreat in 1322. It was restored by the liberality of King Robert the Bruce; given to the flames by the army of Richard II. in 1385, and sustained repeated injuries from other inroads. It was tenanted by the Cistercian monks who, whatever may have been the original severity of their order, appear ultimately to have gained the reputation of being anything but ascetics, for

> "The monks of Melrose made good kale
> On Fridays when they fasted,
> And wanted neither beef nor ale
> So long 's their neighbours' lasted."

The abbey was rendered uninhabitable during the destroying zeal of the Reformation, and the building seems subsequently to have been looked upon as a quarry for the erection of private and public buildings, and the repair of mills and sluices. In the early part of the 17th century the nave was fitted up, and for some time used as a parish-church, and a vault, which still remains, thrown over it with the stones of the old building. The ruins are now carefully preserved and placed under charge of a keeper. There are several different designs shown in the clerestory openings, of which two are shown in our illustration. Their capitals, together with the pateras and boss, are excellent specimens of the characteristic carving of the building.—W. C.

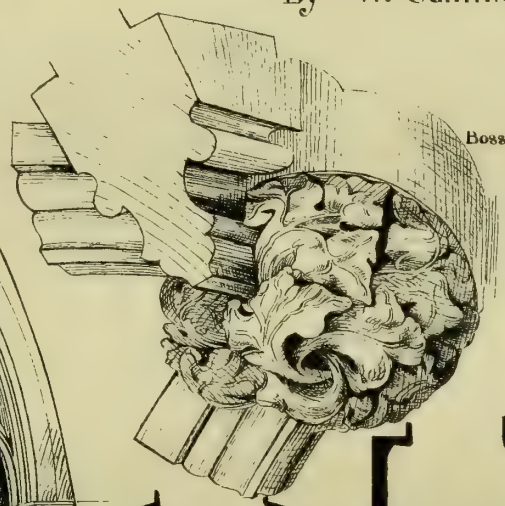
* See BUILDING NEWS for December 31, 1880.

BRARY

Sketches from Melrose Abbey

By W. Canning.

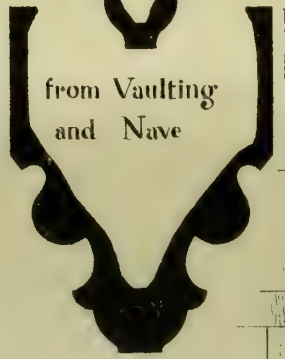
West Clearstory of South Transept



Boss 10½ Ins. Diar.

Groin Ribs of Vaulting and of Boss from Aisles

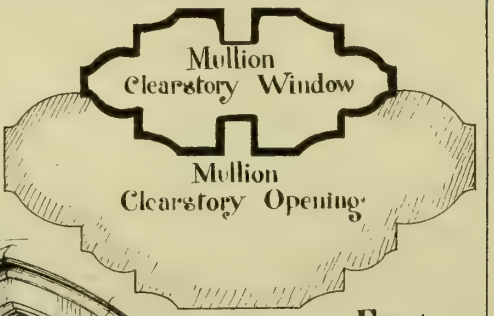
Groin Ribs of Transept



from Vaulting and Nave

Scale to Sections

0 1 2 3 4 5 6 7 8 9 10 11 12 Inches



East Clearstory of North Transept

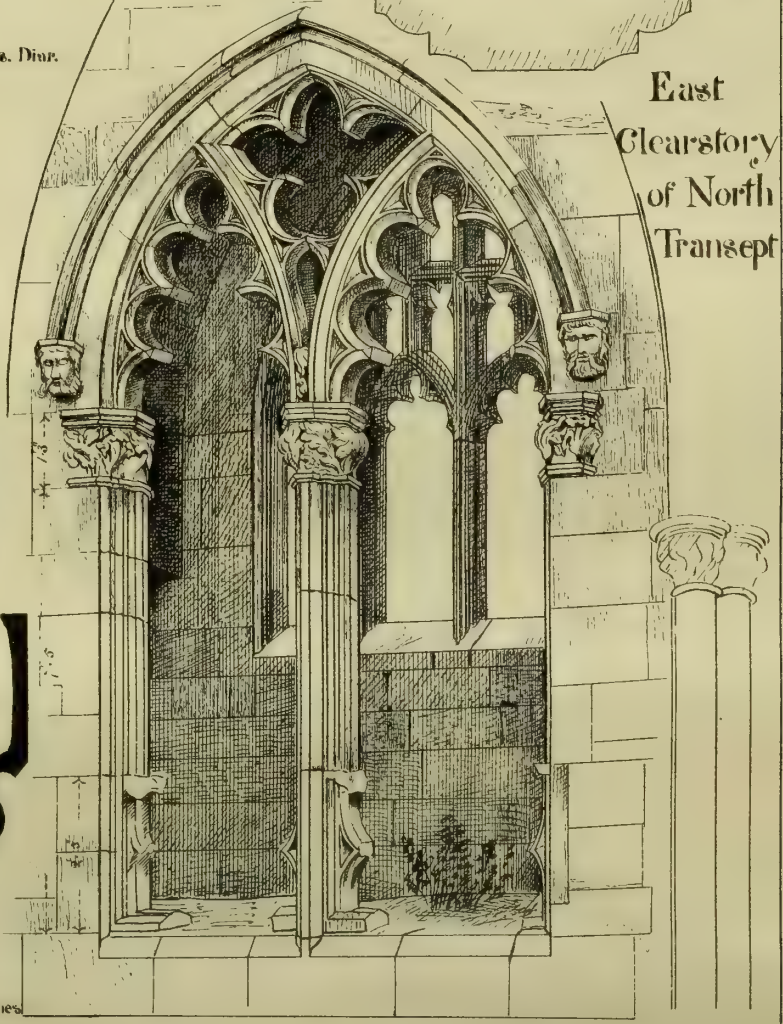
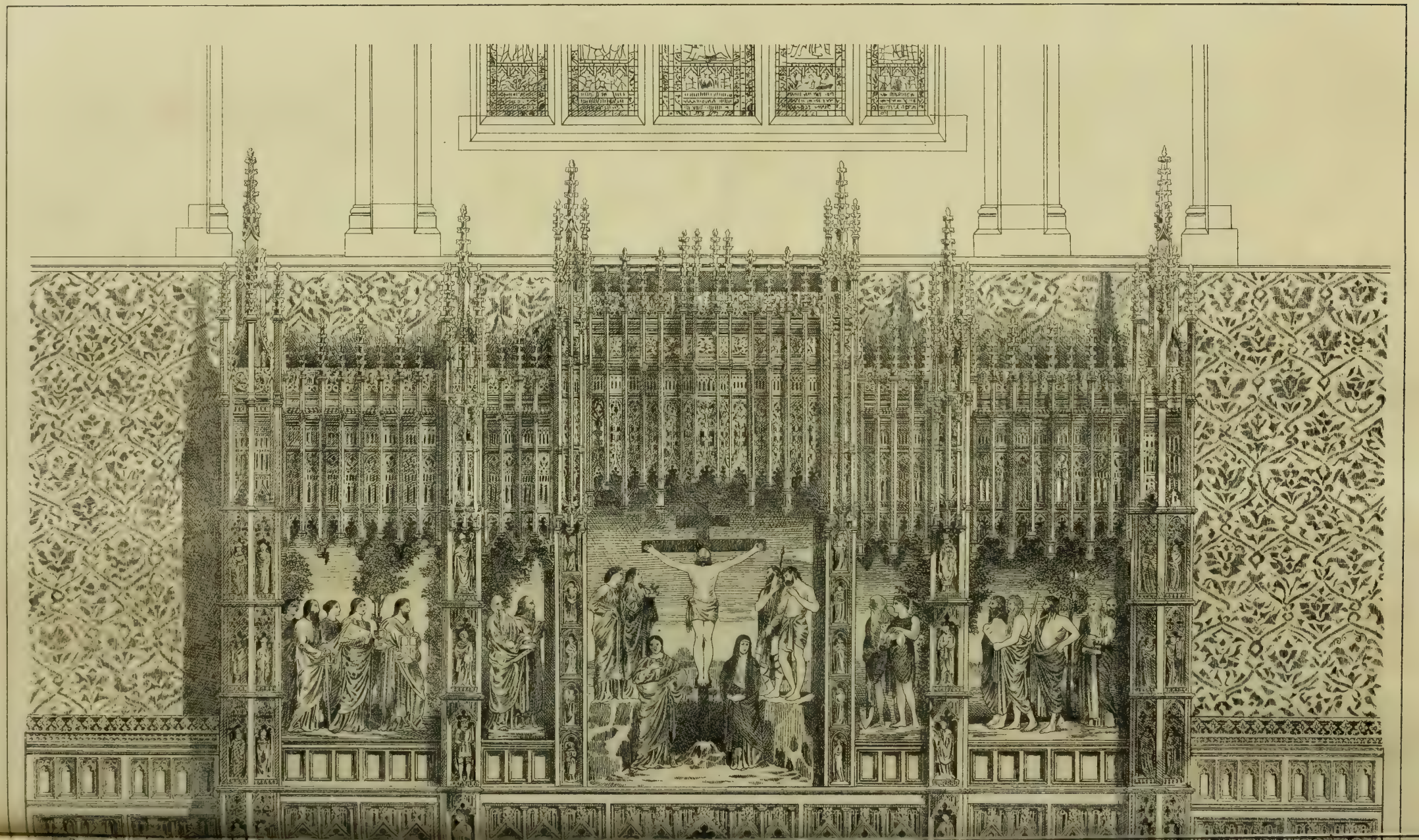


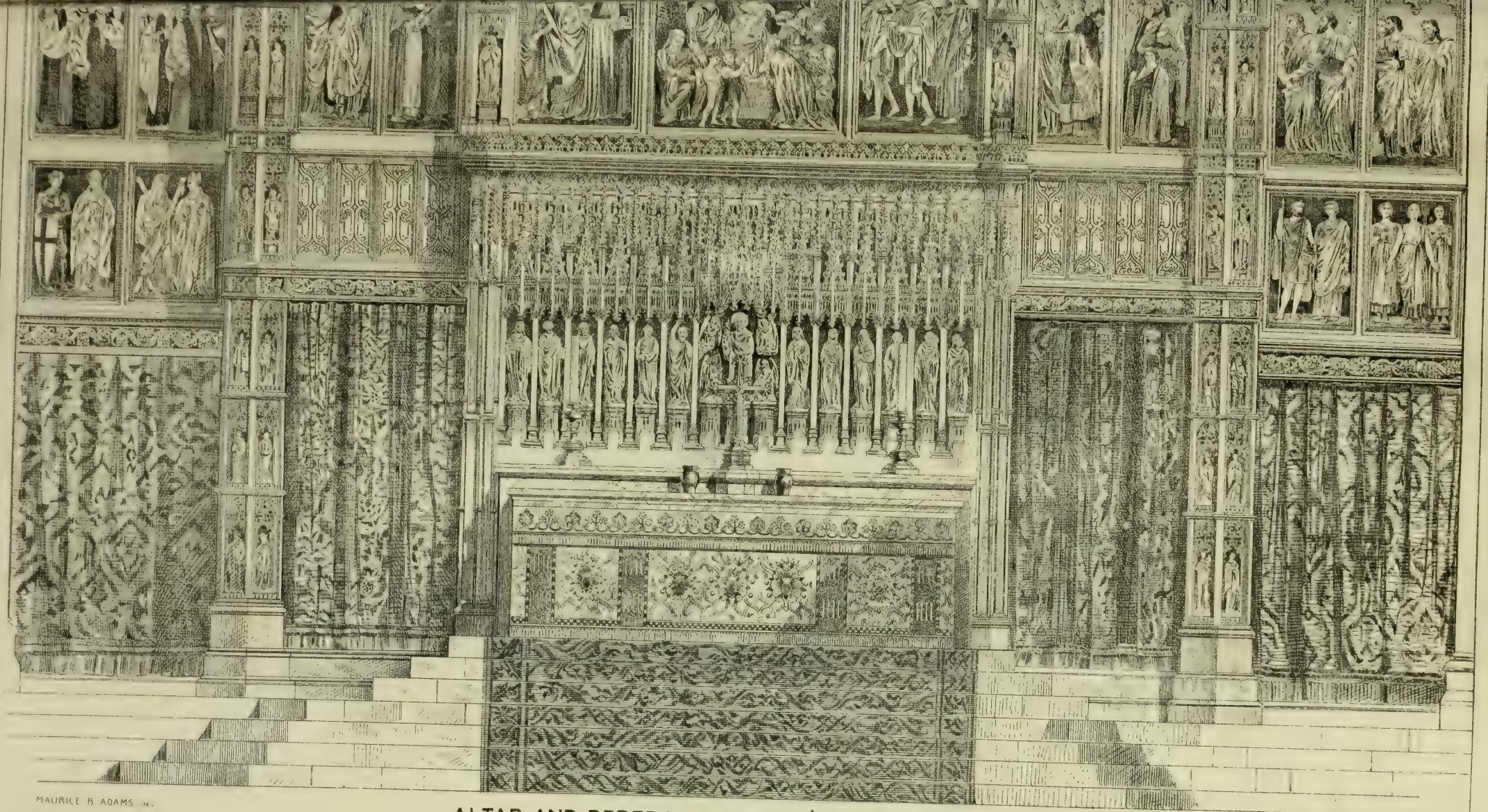
Photo-Lithographed & Printed by James Akerman, 6, Queen Square W.C

Photo Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

OFFICES IN SUNBRIDGE ROAD - BRADFORD

WAUGH AND ISITT, ARCHITECTS





MAURICE B ADAMS del.

ALTAR AND REREDOS S MARTIN'S CH. BRIGHTON

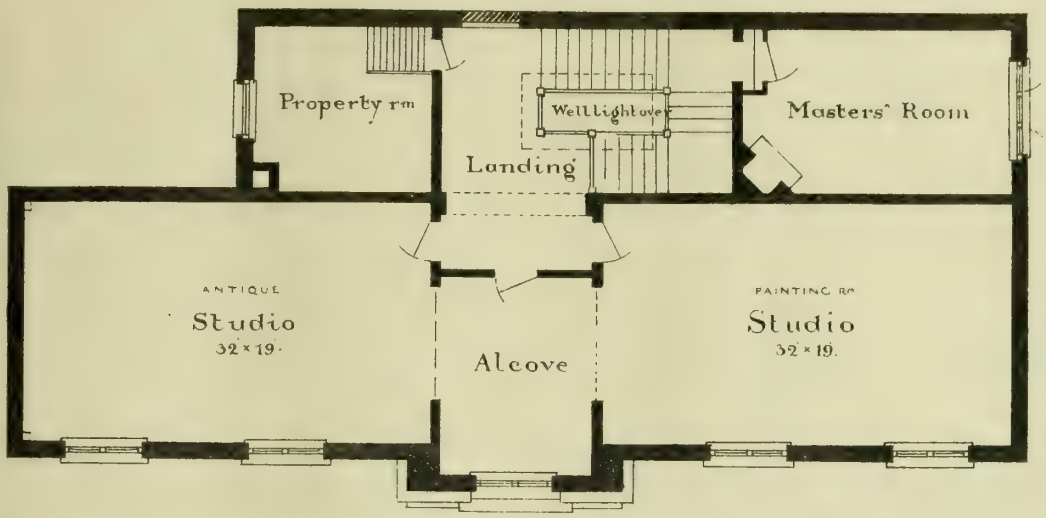
SOMERS CLARKE JUNR ARCHITECT.

Photo Lithographed & Printed by James Akerman, 6 Queen Square, W.C.

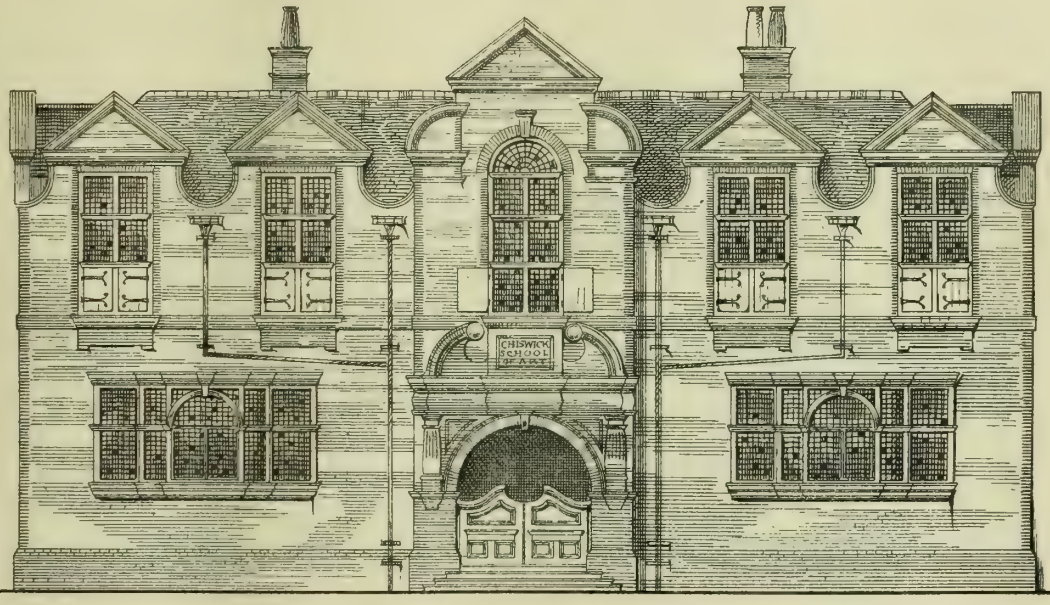
Chiswick School of Art

Bedford Park

Future Extension



First floor Plan

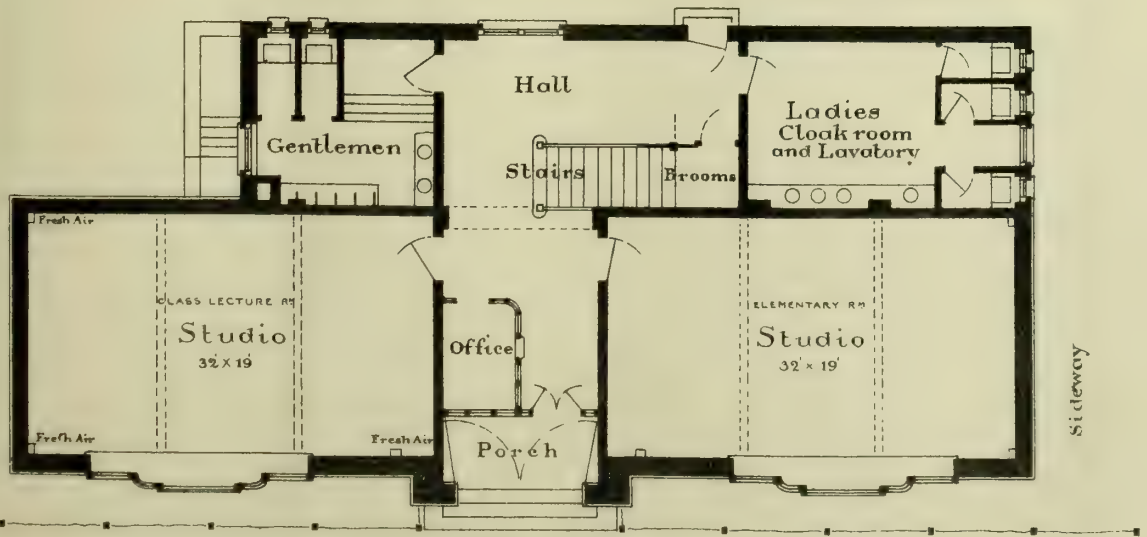


floor

floor

Front Elevation

Future Extension



Ground Plan

Scale of feet

10 0 10 20 30 40 50 60

MAURICE B. ADAMS A.R.I.B.A.
ARCHITECT BEDFORD PARK W.

Photo-Lithographed & Printed by James Ackermann, 6, Queen Square W.C.

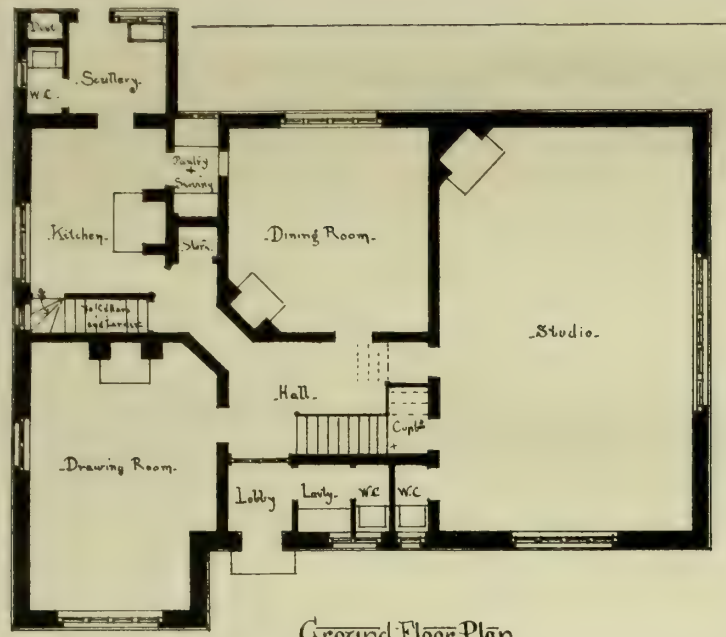
"Building News" Designing Club.

An Artist's Studio and Residence.

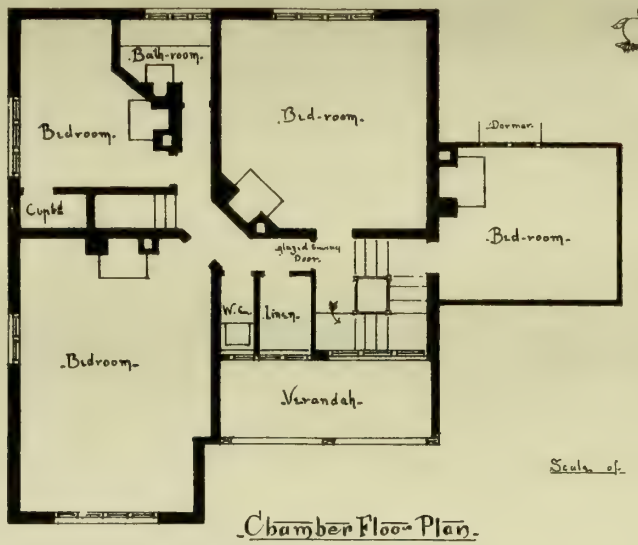
Note. The verandah over Lobby etc is entered from Landing at a and the window lights continued down to that level which would give plenty of light to Hall. Reclaimed glass light to be put over the bathroom door. Sufficient light would get up the servants' staircase to light the junction of the passages. Materials red brick, tiles. All wood-work to window to be painted white.

"Cui Bono"

SECOND DESIGN

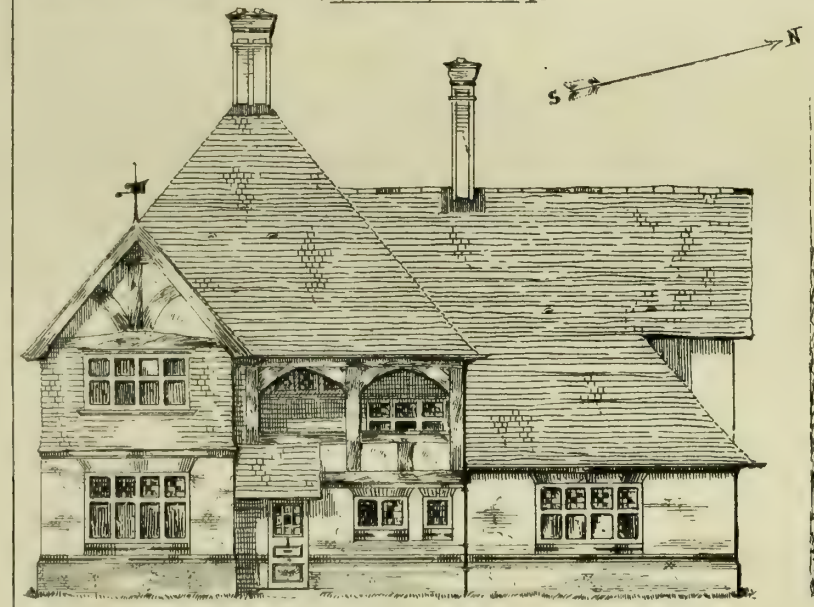


Ground Floor Plan.



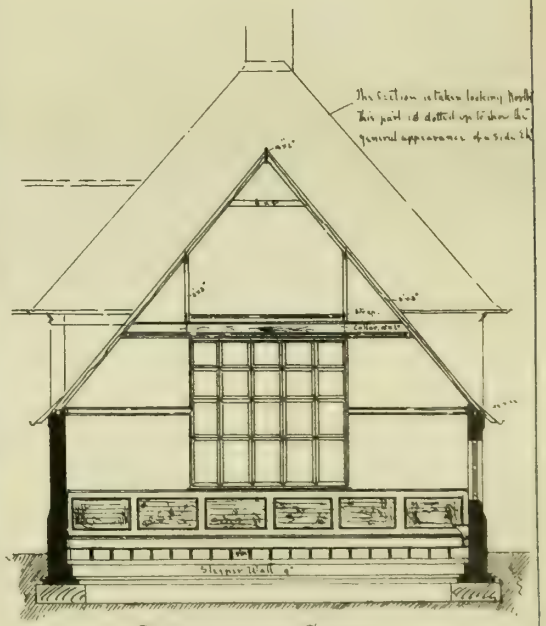
Chamber Floor Plan.

Scale of 0 1 2 3 4 5 10 15 20 Feet.



Elevation.

Sketch.



Section thro' Studio.

Photo-lithographed & Printed by James Ackermann, 6, Queen Square, W.C.

OBLIQUE BRIDGES.*

A NEW edition of Mr. Buck's well-known treatise on Oblique Bridges has just been brought out, in which we find that the original essay has been thoroughly revised by his son, Mr. J. H. Watson Buck, and several inaccuracies which had crept into the plates and letter-press have been corrected. In the present edition also, a simplification of the analysis of the developments for obtaining the dimensions of the twisting rules has been attempted; in other respects, the book does not materially differ in appearance from the old edition. The subject is well illustrated. No less than 12 plates of diagrams accompany the descriptions, leading the student from the elementary principles to the method of construction. The oblique arch is not a modern invention, as some have imagined. In Italy, the art of oblique bridge construction appears from Vasari to have been known as early as 1530, when Nicola, called Il Tribolo, erected a bridge over the river Mugnone, near Porta Sangallo at Florence, on the main road to Bologna. Few writers on the subject have investigated the principles of the art in this country before Nicholson, who was the first to elucidate the subject, and to explain the method of constructing skew arches with spiral courses. Mr. Buck's treatise is, however, recognised as a standard text-book; and the author's treatment has divested the subject of many of the intricacies supposed to belong to it. The first chapter contains a concise geometrical exposition of the subject, from which the student will obtain a correct idea of the elements of the oblique arch. The development of the surface of an oblique section of a cylinder lies at the root of the oblique arch, and the explanations given of the diagrams on plate 3 are sufficient to convey the principles to the student and to remove any preliminary difficulty. At the same time, any one who attempts to make working-drawings of the joints in the development of the extrados, or the elevation of the face of an oblique arch, will find the projection of lines tedious and troublesome, and any great degree of accuracy will be impossible. To facilitate the construction of bridges of this kind, it becomes necessary, therefore, to resort to computation. Mr. Buck enters into the investigation of the formulæ for determining the dimensions and angles, and shows that the means of determining the point at which the joints of the arch face meet, also lend other valuable aid. Of course, trigonometrical knowledge is required in working out the formulæ. In another chapter, the method of working the voussoirs, or the winding beds of the voussoirs, obtained by the use of the "twisting rule," is described, and the manner of finding the dimensions of the two rules employed by the mason or bricklayer given. But the most useful part of the treatise is devoted to practical examples of the application of the formulæ. The numerical values attached are those suited to actual bridges, and the first example given illustrates the case of a bridge of 33ft. span, of semicircular form, to carry a railway over a road at an angle of 50°. The results are tabulated, and the author shows how they are to be applied in the construction of the twisting rules, and templates for the workmen. The mode of erection is the subject of another chapter; after which, some useful rules follow for the making of moulds for drawing oblique bridges; these are cut out of thin wood or cardboard. Some valuable observations are made in the concluding chapter, on the extent or degree of obliquity, to which it is safe to construct an oblique arch, and the calculations made lead the author to the conclusion that an angle of 25°, "is the natural limit of obliquity to which an arch can, with scientific propriety, be constructed, when composed of an entire semicircle on the direct or square span." The angle of 45° has been considered as the greatest degree of obliquity at which it is safe to construct an arch; but, as the author observes, such an opinion has been formed from the practical difficulty found of making semicircular arches safe at that angle, and because this difficulty increases from 90 to 45 degrees, it has been assumed to increase from the latter, downwards; whereas, the contrary is the case. The work is confined to oblique arches, which are cylindrical upon their right section; those with elliptical direct sections are not considered, as the author just considers them deficient in stability! Mr. W. H. Barlow's description and diagrams for facilitating construction, are valuable auxiliaries in saving computation, and add greatly to the practical value of Mr. Buck's labours. As a guide to the engineer and architect on a confessedly difficult subject, Mr. Buck's work is unsurpasseed.

* A Practical and Theoretical Essay on Oblique Bridges. By GEORGE WATSON BUCK, M. Inst C.E. Third edition. Revised by his son, J. H. WATSON BUCK, M. Inst. C.E. London: Crosby Lockwood and Co.

Building Intelligence.

BATH AND WELLS DIOCESAN SOCIETIES.—The quarterly meeting of these societies was held at Wells on Tuesday week, when the following grants were made:—St. Lawrence Church, Priddy, for extensive repairs and restoration, £100; to St. Lawrence Church, West Harptree, for extensive repairs and re-roofing, £100; new mission church in the parish of St. John, Bridgwater, £100; to St. Mary's Church, Norton-sub-Hamdon, towards restoration, £10; to St. Michael's Church, Timberscombe, towards restoration £10; to school at Wellow, near Bath, £10 towards new class-room. The report of a sub-committee was read as to the appointment of honorary architect in succession to the late Mr. Benjamin Ferrey, F.S.A. Out of 17 candidates Messrs. E. B. Ferrey and J. D. Sedding, both of London, had been selected. On being put to the vote, Mr. Sedding was elected.

ELTHAM.—The opening services of the Bible Christian Chapel, Eltham, took place on the 13th inst. The building is Gothic. The front is faced with red bricks, and has a large five-light window filled with tinted glass, the tympanum being filled with diagonal bricks and terra-cotta tiles. The sides are in best stock bricks with red bands and arches; the building being covered with Broomhall tiles. The open benches are in pitch-pine, and the rostrum (part ornamental) is of the same material, but polished. The whole of the roof-timbers are exposed, together with the work, and varnished, the principals and purlins being stained. The whole of the works have been well executed by Messrs. Watts and Davies, builders, of Foot's Cray, Kent, from designs and under the superintendence of the architect, Mr. Wm. Theobalds, London.

SALISBURY DIOCESAN CHURCH BUILDING ASSOCIATION.—The first quarterly meeting of this association for the present year was held on the 4th inst. There were only two cases which could be dealt with. The first was an application for a grant towards the restoration of the parish-church of Tidcombe, in the archdeaconry of Wilts, which is in such a dilapidated condition as to require re-building. The proposed works are estimated to cost £700, of which £300 has already been provided, and an increase of accommodation to the extent of twenty-two additional sitttngs being secured, a grant of £60 was made. The other case was from the tything of Chicksgrove, in the parish of Tisbury, in the archdeaconry of Sarum, a grant being required towards enlarging the existing school-chapel there, by adding to it a chancel, which will give seventy additional sittings; the proposed works to cost about £300. A grant in aid of £25 was made.

STAMFORD.—The new banking premises at Stamford, for the Northamptonshire Banking Company, have been in progress during the last 18 months, and were occupied for the first time on the 22nd ult. They are situated in High-street. In them is contained all the accommodation required for an extensive banking business, including a residence for the manager. The main front, of Portland and Bath stone, rises to a height of 50ft. above the pavement, and is designed in the English Renaissance style. It is divided into four bays, the two side ones of which project slightly from the main line and contain the entrances to the bank and manager's house. The banking-room is lighted by two large windows in the main front. The fittings, consisting of desks, vestibule, wainscoting, doors, &c., are of American walnut, with mahogany panels and oak mouldings, all from special designs of the architect, as is also the chimney-piece, consisting of a marble mantel, with walnut, &c., overmantel, containing a clock. The wall above the wainscoting, and the panelled ceiling, have been decorated in colour. The space allotted to customers is laid with marble mosaic, by Messrs. Burke and Co., of London. The manager's and strong-rooms are situated at the back of the banking-room, into which they open; there is an extra strong-room for plate, valuables, &c., in the basement. The manager's residence has dining and drawing rooms, kitchen, pantry, and the necessary domestic offices, several bedrooms and a bathrom on the first and second floors, approached by a staircase in pitch-pine and mahogany, with a separate staircase for servants. The whole of the works have been most efficiently carried out by Messrs. Roberts Bros., of Stamford. The architect is Mr. W. Talbot Brown, A.R.I.B.A., The Square, Wellingborough.

STONYHURST COLLEGE.—The college of the Jesuits at Stonyhurst is being further enlarged. Two years ago a new wing was erected at the north end, and now a new wing on the south end is nearly finished, and other important additions have yet to be made before the scheme of enlargement is complete. Some idea of the scale upon which the new part is designed may be gleaned from the fact that the academy-room is 98ft. long and 50ft. wide. The ceiling in this room will be one of the richest examples executed in modern times. The style is Jacobean, and the modelling is founded on the type of those famous ceilings at Aston Hall; but in addition to this a deep plaster frieze, composed of shields, animals, fruit, flowers, and arabesques, will be carried along three sides of the chamber. It is computed that the total expenditure upon the proposed additions will be a little over £120,000—that is, exclusive of the stone, which is quarried upon the college estate. The architects engaged are Messrs. Dunn and Hansom, of Westminster, and the whole of the sculptured details and modelling are entrused to Mr. Roddis, of Aston. The contractor for the building is Mr. Thos. Craven, of Blackburn.

WYNARD'S ALMSHOUSES, EXETER.—This rather interesting block of old buildings, standing just without the site of the city's ancient south gate, has been restored. They were built by William Wynard, the third recorder of Exeter, in 1436, but some of the original buildings were destroyed during the sieges in the civil wars in the 17th century. The group consists of a chapel, and houses for 12 indigent men, built in a square with an open courtyard in the midst. The buildings, having become somewhat ruinous, have just been carefully restored under Mr. Edward Ashworth, architect, of Exeter. The north front of the quadrangle has been nearly all reconstructed in Heavitree stone, and the chimney-shafts of the dwellings are rebuilt in brick and Bath stone. The walls have been raised 18in., thus giving additional comfort in the heretofore low-ceilinged bedrooms. The roofs of the north, east, and west sides of the quadrangle have been reconstructed of new timber. The coating of roughcast has been beaten off the fronts of the houses, and the facing of Heavitree stone repaired and made in conformity with the chapel. The bell-turret and the labels and string-courses have been made good where need be. The woodwork was done by Mr. Vicary, the masonry by Mr. R. Mitchell, the carving by Mr. Harry Hems, and the painting and glazing by Messrs. Kingwell and Son; all these tradesmen being of Exeter.

At the West Sussex Quarter Sessions, held on Thursday week, a report was received from the highways committee as to the appointment and duties of a surveyor for the division. The report stated that there were four duties falling upon the surveyor as an officer: those of inspecting every county bridge, and to report on its state; to inspect and report on other bridges when called upon to do so; to inspect police-stations and other county buildings; and to inspect the main roads at least four times in every year. It was recommended that the duties required for bridges and county buildings should be separated from those relating to roads, and that the two offices be discharged by different persons—the one to be a member of the Institution of Civil Engineers, and to be called the county-surveyor; the other to be a competent county road-surveyor. The pay of the former should be an annual retaining-fee of 50 guineas, with 1½ guineas for each attendance to inspect bridges and buildings, and 5 per cent. commission on all contracts above £20; commission to include plans and specifications. The county-road surveyor should be paid £100 a year, including travelling and all expenses.

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[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

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A. D. (No.)—J. R. (One of Boyle's or Milburn's cowls.)—ENQUIRER. (Of course it is not honest, but there is no legal remedy.)—A CONTRIBUTOR. (Yes; there is no law about it. 2. From the square of the sum of the top and bottom circumferences subtract their product. Multiply the remainder by one-third of the height. and by ·07958. The result is the cubic content. See a treatise on Mensuration.)

"BUILDING NEWS" DESIGNING CLUB.

F. HARRISON AND OTHERS. (The height of floors we gave was intended for the inn at the corner of site, but we think 11ft. would be better. If there is no room for a section in the sheet, it may be omitted.)

Correspondence.

SANITARY PROTECTION ASSOCIATIONS.

To the Editor of the BUILDING NEWS.

SIR,—Judging from the evidence now available, it is undeniable that room exists for the formation of a sanitary protection association, based upon sound principles, for the metropolis, where, if we may rely upon one statement made during the discussion on Professor Jenkin's paper at the Society of Arts, 50,000 new houses, unfit for habitation, are annually added to the enormous number believed to exist already within its limits. Although the discussion does not appear to have been upon any very extensive scale, one or two remarks were offered in criticism of the proposal, which many will be unable to regard as having been satisfactorily disposed of by the author of the paper in his reply, and on which it might be well to elicit the opinions of outsiders to whom the subject of house-sanitation is familiar.

Mr. Cresswell, in expressing his disappointment at the insignificant proportions of the association's operations, doubtless had his own more extended scheme of sanitary assurance in view, and it may, indeed, fairly be urged that if domestic sanitary inspection be necessary at all, it is a subject with which nothing short of compulsion and universal application can effectually deal. A purely voluntary association, such as that advocated in the paper under review, will obviously fail to bring within its scope that large class of anything but sanitary property which owes its origin to speculative building, a circumstance which, while it may not affect the value of the association to its actual members, clearly detracts from its efficiency as a means of improving the sanitary condition of London as a whole. It is evident, therefore, that the largest possible measure of success which may attend the new association will not imply more than the merest nibbling at the fringe of the domestic insalubrity known to abound in the metropolis.

This much being premised, it will be well to consider, in greater detail than the promoters seem to have devoted to the question, how far the objects of the association are likely to be attained, even for its members, by the proposed system of inspection. In this matter the objection raised by Mr. Rogers Field may be said to be well-nigh fatal to the practical success of the scheme. Mr. Field's experience in house-drainage, both in and out of London, is almost unique, and certainly entitles him to be heard on such a point as the amount of time required for the perfect examination of a house previous to the preparation of a report on its sanitary condition. He evidently considers the terms of the association too low to secure proper attention to this very important preliminary, and is supported in this respect by Mr. Collins, who regards the matter from a thoroughly practical point of view, especially in condemning the idea that a young and inexperienced man can be trusted to deal with this question under the merely nominal supervision of a consulting engineer, no matter how eminent the latter may be. Professor Jenkin, it is true, partially anticipated this objection in the body of his paper by arguing that the resident engineer of the parent association in Edinburgh "is paid at the rate common for men of his standing," and that "the consulting engineer receives a fee which, *having regard to the call on his time*, is remunerative." Now, our examination of the figures in the Edinburgh association's balance-sheet for the second year, as appended to the paper, shows that a salary rising from £150 to £170 per annum has there been paid to the resident engineer, and that the annual remuneration of the consulting engineer (Prof. Jenkin himself) is £52 10s. The association has been in existence not quite three years, during which time 1,200 houses are stated to have been improved, the total cost of Professor Jenkin's services being thus £157 10s. at most, an amount which, divided by 1,200, yields the munificent average of 2s. 7½d. per house, as the remuneration of the consulting engineer, by whom, as he himself states, this amount is considered "remunerative." The explanation of this seeming paradox may possibly be that in the large majority of cases the projected alterations are never brought under the notice of the consulting engineer at all, but effected upon the sole responsibility of the resident and subordinate official. But if this be so, the fact assuredly militates against the fundamental idea of the association, by which the aid of co-operation is invoked in order to secure eminent and authoritative advice in contradistinction to the counsels of second-rate and inexperienced persons. Pursuing the financial question still further, and taking the salary of the Edinburgh resident engineer at £150 per annum for the first two years, and £170 for the third, it will be seen that a total of £470 for the three years is to be considered under this head, which, treated as before, yields an average of 7s. 10d. per house for the 1,200 which have been improved. Making every allowance for the benefits of co-operation and the extolled absence of pecuniary gain for the association, it is simply impossible that sums such as these can be considered sufficient to secure the requisite amount of engineering supervision over works under execution, especially when the peculiarly detailed nature of house-drainage work is considered. On this point I would just draw attention to a flaw in the argument advanced by Mr. Robins, who quotes a case in which certain recommendations of the Edinburgh Association were carried out at St. Andrew's by local workmen, and *afterwards inspected*, presumably by the officers of the association. No one with any knowledge of the subject would wish to depreciate the advantages, and even the necessity, of good design in work of this class; but it would be idle at the same time to ignore the fact that faultless execution is just as much to be kept in view, and this it has over and over again been found impossible to secure by any so-caled system of final inspection, or, in fact, by anything less than the most minute and skilled supervision over such items as pipe-laying and jointing, and the setting of traps and other fittings. No adequate inspection of such work, can, by any possibility, be performed by one man who, as stated with regard to Edinburgh, has been expected to visit 450 or 500 houses per annum, in most of which, as the figures show, structural alterations have been in progress at the time referred to.

There is one other objection which, it seems, has already been raised against the formation of the London Association—that of unfair competition with professional men as sanitary advisers. This, while Professor Jenkin alludes to it in his paper, he takes no pains to meet in any effective way, although it will probably be admitted that the figures already quoted constitute a remarkable confirmation of the charge. An association which tacitly claims to be in a position to supply the engineering advice and control requisite for the sanitary improvement of a house for an average sum of 10s. 5½d. can hardly be said to leave much scope for remunerative charges by professional men for their evidently more deliberate and exhaustive treatment of a residence. Neither can it be held that the Edinburgh Association, in undertaking to advise in sanitary matters beyond the limits of that city, has been careful to avoid a similar charge of interference with professional interests. The same report from which Professor Jenkins has extracted the balance-sheet to illustrate his paper, contains the names of several public and private establishments in various parts of Scotland in regard to which the advice of the association's officials has been obtained, and there is even one case named in the report in which an *English* infirmary was favoured in the same way. Under these circumstances, it would have been but fair to waive all claims of commercial disinterestedness on the part of the Edinburgh Association at least, and to state, also, whether the London Association proposed to extend its operations in a similarly objectionable manner. There is an essential difference between a mutual protection society and a huge trading association, and it can hardly be expected that those who would favour the one would necessarily be inclined to further the aims of the other. This must especially be the case when, as has been shown, defects in principle exist in the organisation, from which either the work or the members must eventually suffer.—I am, &c.,

JOHN S. HODGSON.

Hexham, Jan. 17, 1881.

SHEFFIELD FONT COMPETITION.

SIR,—In reply to "A Last Resource," I can state that the *premium* and *work* for the above have been given to a "local modeller" for a *semi-Classic design*, introducing *stone* and *bronze*.

The principal architectural firms in Sheffield refused to compete, for reasons given in your paper by a former correspondent.—I am, &c.,

NOT A COMPETITOR.

SIR,—I, too, was a competitor in the Sheffield Font Competition. My drawings were duly returned, carriage paid; but, unlike "A Last Resource," I was informed that the execution of the font was given to a sculptor of Leeds (I think), and the £5 premium to a gentleman of Sheffield.—I am, &c.,

HENRY TERRY.

34, Crawshay-road, North Brixton.

MODERN DOMESTIC ARCHITECTURE.

SIR,—Some seven years have elapsed since the cry went forth that Queen Anne should reign, and that all noble Goths should be felled to the ground. That cry has, in great measure, been fulfilled; but have we much cause to be proud of the result? When one thinks of some of the work which was being palmed off on the world as Gothic, he need not wonder that a change was welcomed. But now, having given our "lady help" a fair trial, we may well ponder on the past, and ask ourselves whether we should not be wise in letting the venerable Goth have another opportunity of redeeming his character; for was he not the very best of servants for ages before Queen Anne was born, and also after her death; therefore, do not let an upstart with a fictitious name have it all her own way.

A well-known architect once made the absurd remark that we could not have Gothic without pointed arches; but, as the same man has since written a book in which there is so much in praise of my old friend (notwithstanding his evident desire to tread him underfoot), I forgive him.

I trust that no one will jump to the conclusion that I have no sympathy with the so-called Queen Anne revival or mania, for such is not the case, and my belief is that it has done us a vast amount of good; but whilst we appreciate its many successes, we cannot but deplore its numerous failures; and I am convinced that we are losing much by trying to ignore a style which has served us so well in the past, and which is capable of doing so again in the future. My strong conviction is that it depends much more upon the man than the *style*, as to whether a fabric is pleasing or the reverse, and I am of opinion that there is no style of architecture in existence out of which a clever man would not be sure to produce something interesting.

Skill and common-sense will work wonders, and a Gothic house in good hands would be no more costly, and could be made equal in every respect to the very best in the Queen Anne style which ever has or will be built.

Some prejudiced people will doubtless say: Show us some good Modern Domestic Gothic. True, it is more rare than it should be; but if any one will go to Burleigh-street, Strand, he will find there a little house, designed by Mr. Butterfield, and erected about 15 or 20 years ago, well worth the visit; from there, let him go to those Queen Anne Mansions at the back of Sloane-street, and in their midst, at the corner of a square, he will find a charming Gothic house designed by Mr. Street (without small panes dotted all over its front, like some of its neighbours) thoroughly domestic and thoroughly modern. I know of only few successfully treated modern stone-mullioned windows; but the Gothic part of a house on Campden-hill, designed by Mr. Norman Shaw, is well worth study for this kind of fenestration; and the other day I came across a truly delightful example glazed with plate glass near the Castle Bar Estate, Ealing. Gothic windows generally look well with large-sized sheets of glass, but Queen Anne windows do not; and, as a proof that this fashionable style owes its popularity in a great measure to the colour of the materials used, and its small panes with thick white sash bars; I cannot do better than draw attention to the unsightly appearance of a dormer in cement, and a window minus its white bars, in a block of buildings on the Chelsea Embankment. Mr. Waterhouse's Red Gothic in Holborn may be studied as a successful link between what is purely domestic and ecclesiastical. Trusting that these musings will, to some extent, be the means of arousing those giants of the pen, and others who, for a time, battled with the insidious tempter, but who now seem to be revelling in her fascinating arms.—I am, &c.,

W. GALSWORTHY DAVIE.

5, Pembroke-gardens, Kensington.

HOTEL DE VILLE, BRUSSELS.

SIR,—In your issue of Dec. 24, 1880, there appeared a view of the Grand Place, Brussels, taken from a drawing by M. Brandling.

No doubt the picture would be "telling," on account of the subject, and it is extremely interesting to anyone who has been in Brussels.

But will you allow me, sir, to point out some of the discrepancies which appear between the plate and a photograph which I got in Brussels some six or eight years ago. I shall only mention some of the most obvious differences in the matter of detail, and can assure you the drawing is quite unreliable.

To begin with, the photo. shows five double bays between the nearest (south, I expect) turret and the tower, each bay having two arches in same, i.e., ten arches and windows over; the double bays are separated by stronger piers and double statues. A sort of niche apparently is formed in the parapet to finish the pier between bays. All this is ignored in the drawing.

At the other side of tower the arrangement *really* is quite different from what it is on the south side; but the drawing shows the same, and also two or three windows in excess. The parapet here ought to be quite different to what it is on south side.

The ground-floor arches in south turret at angle and in tower are very different to what is shown by photo.

According to photo, in order to make way for some entrance steps, two pillars carrying arches on south side of tower are omitted, and the arches apparently carried by a mere pendant.

From the drawing one could not gather that there is a beautiful series of statues between first and second floors, as well as others on the piers between the windows.

The photo. shows a clock, apparently, on the turret at south-east angle; the drawing a large one on tower.

The tower itself is anything but correct. The large pinnacles are shown connected by cusped arches in photo., and that which is corbelled out over the ridge looks graceful, whilst in drawing it is most awkward. Indeed, the corbelling out of the first parapet to tower is anything but correct.

There is only *one* gable at the south end of building, the roof being returned past that gable, same as in front. The turrets at each side of said gable are shown much too high—in photo they appear to be just in line with highest point of "steps" to gable.

It is needless to call attention to minor points; I have said enough to show that the drawing is of no use to architects as a study of the grand building it so *unfaithfully* represents. The series of Belgian town-halls is unrivalled, and I have wondered sometimes that we have had no reliable drawings of some of them among your generally invaluable plates.—I am, &c., M.

WESTWOOD HOUSE, SYDENHAM.

SIR,—Mr. Lawrence's statement in your issue of the 7th inst., that the bricks for the cornices were moulded by him, is not correct. The whole of the pilasters, cornices, and other architectural features are of red brick, supplied by Mr. Lawrence, but rubbed, gauged, and moulded by hand on the job. A few bricks of different sizes were made to suit the detail of the cornices: hence the mistake. The balustrading to terraces and verandahs are built up in brick and turned. The carving is being done by Mr. Nicholls, of Lambeth.—We are, &c.,

VEITCH AND CLOSE (the Builders).

89, Stanhope-street, N.W., Jan. 18.

CHIPS.

The annual prize distribution at the Gloucester School of Science and Art took place on Tuesday week; the report showing a slight increase in the number of students, and that 20 more certificates were gained in the examination than last year, while there were 13 fewer failures; 12 Queen's prizes, and 54 certificates were gained.

On Thursday in last week a fatal accident occurred at the stone quarries of Messrs. S. and L. Cliff, at Lanehead, Brighouse. Eight men were being drawn by a crane and chain and box, from a quarry 120ft. deep, and when half-way to the surface a link in the chain opened as it passed over the jib, and the box and men fell to the bottom. All were seriously injured, and one named Heaps died soon afterwards. The chain had been used for hauling loads of stone weighing about five times as much as the men and box.

A massive tomb has just been erected in Folkestone Cemetery in remembrance of the late Mr. J. H. Challis, of Shorncliffe. It is constructed of the finest Carrara marble, weighing 19 tons, as worked, exclusive of the lining of vault, &c., and is 14th-century in character. On the principal face of the monument is a medallion portrait in statuary marble of the deceased, surmounted by his coat of arms, crest, and motto. Mr. George Prebble, of Folkestone, was the builder.

A master cabinet-maker, named William Blackwell, carrying on business in Shoreditch, was sentenced, on Tuesday, to 21 days' imprisonment by the magistrate at Worship-street, for an assault on one of his journeymen, Robert Everett.

The improvement commissioners of West Hartlepool were offered, and accepted, on Tuesday on behalf of the town, 17 acres of land to be laid and maintained in perpetuity as the Ward-Jackson Memorial Park.

The night watchman emp'oyed at the establishment of Messrs. William Cubitt and Co., builders, Gray's Inn-road, was found on Tuesday morning frozen to death.

The body of Mr. Montague Pritchard, son of Mr. Pritchard, civil engineer, of London, who was drowned by the capsizing of a boat off Montfirth on New Year's Day, was recovered on Thursday last.

The water-side premises of the Burham Brick, Lime, and Cement Company, in Belvedere-road, Lambeth, were destroyed by fire on Tuesday. The occurrence resulted from the abnormally high tide slaking the stores of lime.

A new café and hall, to be known as the Dalrymple, are about to be built at Fraserburgh, from the designs of Messrs. Jenkins and Marr, architects, Aberdeen.

Intercommunication.

QUESTIONS.

[6361.]—**Sewage Sludge.**—I should be glad if some of your able correspondents will give us the latest information on the treatment of this plague of sanitary engineers. I have seen and read of almost every form or process of mud manipulation, but what I ask for more particularly is practical results and facts. Much has been said and written about native guano, special manures, and cement-making. Will some correspondent kindly say where a valuable and saleable manure as a product of sewage sludge is being made, what price it sells for, and how much has been sold at this price, bonâ fide, during the past year? Also as to the cement manufacture, what price per ton does the cement sell for? Has it been sold in large quantities for important works, and where used? Practical information and facts are wanted. I can filter a gallon of crude sewage and make it clear as spring-water. I can make a ton of excellent manure or of cement, but what do these processes cost, and what is the amount realised in the sale? Four or five pounds per ton for manure reads very well, but if anybody wants a few thousands of tons of sewage sludge to operate upon I can find it him gratis, and leave him all the profit,—J. B.

[6362.]—**Damp Walls.**—The front door of my house opens into a small entrance hall, about 15ft. by 10ft. Out of this is an open staircase, leading up to the first-floor, and off the landing of this floor another open staircase leading up to the next floor. The walls of the hall and first stairs are paper, and varnished. Above this the walls are colour-wash. Whenever there is a fall in the temperature the whole of the varnished walls are streaming down with wet, and although there is nothing of this to be seen on the colour-washed walls on the top stairs and landing, the dampness seems to spread throughout the whole of the house, so much so that I fear the health of the family suffers from it, and I should feel extremely obliged if some kind friend could suggest a remedy. Would a stove placed in the hall, and a ventilator in the ceiling do any good? I have not tried anything of this sort, for I have felt afraid of introducing warm air, lest it should have the effect of drawing out the damp. I ought to state that the walls are stone, and were built without a damp-course, but the excess of moisture only shows itself when there is a change in the weather.—W. G. C.

[6363.]—**Choir Stalls.**—In the choir of Bangor Cathedral, as fitted up some years ago by Sir G. G. Scott, the westernmost stall on each side is canted on plan, so as to face their occupants, the Dean and Residentiary, towards the N.E. and S.E. corners of the chancel respectively. I see in Bowman and Crowther's "Churches of the Middle Ages," that a similar arrangement exists at Nantwich, Cheshire. Are there any other old examples in England?—V. M.

[6 64.]—**Flitch and Truss Beam.**—I shall be greatly obliged if some of your numerous readers would favour me with the safe load a flitch beam (for a store) of the following dimensions will carry, or a formula for calculating the same:—Length of beam, 25½ft.; distance between supports, 24ft.; two 12¾ by 4½ Baltic fir planks, with ¾in. wrought-iron plate in middle, bolted at every 2ft. The beam is also trussed on both sides, with inch tie-rods, which pass underneath two cast-iron plates, which form two struts 12in. deep, and dividing the beam into three equal parts, the truss rods rising at ends of beam to within 3in. of top.—W. McB.

[6365.]—**Party-Wall.**—Thirty-four years ago A. and B. owned two two-story cottages, the gable ends of which (each half-brick wall) abutted upon each other and supported the floor and roof-timbers of the respective dwellings. A. pulled down his cottage and erected on its site a malt-house of greater height. In the progress of the work A. removed the half-brick gable wall and put up another wall of half-brick as high as the gable of the cottage belonging to B. Above that height he built a one-brick (9in.) wall, one half of which hung over and rested upon the wall of B. 1. Is this one-brick wall a party-wall? 2. Is it, or half of it, the wall of B? or (3) is it the wall of A.? A. having acquired an easement to the extent of 4½in. over the property of B., who has now pulled down his cottage, and is intending to erect a higher building; and (4) has B. a right to insert timbers in the 9in. wall erected by A. thirty-four years ago?—PARTY WALL.

[6366.]—**Churches with Thatched Roofs.**—*Notes and Queries* for the current week quotes a number of churches with thatched roofs. In Cambridgeshire, that of Coveney. In Norfolk, Tivetshall, St. Margaret (chancel only), Ingworth (nave), Thurgarton, Trimingham (chancel), Paston, Ridlington, Ormesby, and Norwick St. Ethelred. In Suffolk, Middleton, Pakefield, South Cove, and Fritton. I do not remember having met with any thatched churches save in the Eastern Counties. If such in other parts exist, it might be interesting to record them.—HARRY HEMS.

[6367.]—**Frost Prevention.**—The *Standard* of 17th inst. says: "There are small mechanical contrivances by which we can easily enough prevent the bursting of pipes, the freezing of cisterns, and the blowing up of boilers." Safety valves I know, but what are the other mechanical contrivances alluded to?—ZERO.

[6368.]—**Bricklayers' Charges.**—Mr. Laird, a bricklayer, contracts to do the brickwork of seven cottages and one shop, all to be finished in a workmanlike manner, to the satisfaction of any competent judge. This shop-cellar is built, but a flood comes, caused by the river, and consequently the cellar alluded to is washed down by it. These cellar-walls are again built by this bricklayer. Now, are we justified in paying this bricklayer extra money for the rebuilding of this cellar or not?—A. S.

[6369.]—**Thrust of Vault.**—Will one of your readers inform me whether the following method for finding the thrust of a vault is correct? Calculate the weight of the arch or vault comprised in one compartment or between two adjacent piers; then the thrust may be considered equal to this weight multiplied by the length of diagonal groin, divided by 16 times the rise of the arch.

If correct, please explain what is meant by "compartment" in such a case?—S. M.

[6370.]—**Chambers' Proportions.**—Are Chambers' Proportions of the Modern Orders the usually accepted ones?—S. M.

[6371.]—**Stone Work.**—We have been doing stonework to some offices where quantities were given. The stone used exceeds that given in the quantities. Can payment for the extra quantity be legally withheld?—YORKSHIRE.

[6372.]—**Architects' Charges.**—I have carried out plans for villa, the total cost of which, as per estimates, was £500. Since the building was commenced several additions have been made by the proprietor in the different trades, which will bring the cost to considerably more than the £500. What must I charge for the extras? Can I calculate for the commission on the total cost at finish over and above the £500?—JUVENILE.

[6373.]—**School Plans.**—It would greatly oblige me (a reader of your paper for several years) if some one could tell me the number of boys each class-room is intended to seat in the new City of London School. There are 20 class-rooms, and general size is 24ft. × 22ft. Is 40 the number? If so, 13ft. 6in. is about the surface space per boy. Is this a good allowance? In some schools I find a much larger allowance. What space should be allowed in class-rooms where a large school-room is also provided in a large boarding school?—NOR.

REPLIES.

[6351.]—**Openings.**—The openings mentioned by "Rombald" are all large ones, and, in the ordinary course of measuring, would be deducted, especially the stage opening 22ft. by 20ft., unless a great deal of extra labour, not stated, has been performed. If it is stated in the contract that openings are not to be deducted, a different construction, of course, must be put on the matter; but the case is hardly fully stated enough to enable a satisfactory answer to be given.—G. H. G.

[6352.]—**Wall.**—The answer to "Leo's" question would depend on the crushing resistance of the bricks of the lowest course. This being obtained, the problem is reduced to ascertaining the height to which a section of the wall, say. 1ft. square, could be built before its weight equalled the crushing weight per foot. Practically the crushing of the bottom course would presuppose the bricks all to be of the same degree of hardness (a by no means possible thing) and an equal bonding in the brickwork of the wall.—G. H. G.

[6352.]—**Wall.**—Taking the crushing pressure in lbs. per square inch of brickwork to be 800, and the weight of a cubic foot of brickwork 112lb. Let x = ht. above bottom course of BW in feet. Then $x \times 15 \times \frac{3}{4} \times 112$ = weight of BW resting on bottom course. Area of bottom course = $15 \times 12 \times 9$, and this × by 800 gives pressure that bottom course will support, $\therefore x \times 15 \times \frac{3}{4} \times 112 = 15 \times 12 \times 9 \times 800$, $\therefore x = 1{,}028$ft. 6in., and 3in. added to this will give height from ground = 1,028ft. 9in. —H. S., Belfast.

[6354.]—**Measuring Zincwork.**—A 6ft. chimney-pot, with a bend or elbow in it, is usually charged as 6ft., and the bend extra on, according to the amount of extra work in it.—T. E. JULIAN.

[6358.]—**Stone Shield.**—If a "Constant Reader" will refer to Cussans' "Handbook of Heraldry," page 51 (chapter on Tinctures), he will read that:—"Ermine is represented by an argent field, powdered with sable 'spots,' whilst ermines is the reverse of ermine, being sable, powdered with argent 'spots.'" Such being the case, his course is simple. No. 1, 2, 3, and 4A being ermine, the ground (field) is left perfectly plain, argent (silver) always being shown so in carved work, whilst 2A and 4, being ermines, their fields are sable (black). In engraving and sculpture, sable is denoted by parallel and perpendicular lines crossing each other at right angles, each line being separated from its neighbour by about the width of itself.—HARRY HEMS.

[6359.]—**Mathematical Question.**—AB = 15, BC = 9, AC = 12. Cos. $A = \frac{AC^2 + AB^2 - BC^2}{2AC \times AB}$. Cos. $A = \frac{144 + 225 - 81}{2 \times 12 \times 15} = \frac{288}{360} = \frac{4}{5}$. $\therefore$ cos. A = ·8000 = cos. 36° 52′.—D.

CHIPS.

A new drill-hall, for the use of the 1st North York Artillery Volunteers, was opened in Grange-road, Middlesbrough, on Saturday. It measures 114ft. by 45ft. in the company-drill part, and 90ft. by 30ft. in the portion used for gunnery exercises. It is built of bricks with white facings, and is open-timbered. Adjoining is an officers' room, with sergeants' room above, and a clothes-store next the roof. Captain S. E. Hill prepared the plans and designs, and Mr. Balsher, of South Bank, Middlesbrough, was the builder.

A new block of public buildings is about to be erected in Boscawen-street, Truro, the principal thoroughfare in the city; indeed, until modern improvements took place at Plymouth, it was considered the widest street in Cornwall. The new buildings will consist of a corn-exchange, post-office, and a private shop, and will be Classic in style, agreeing with the adjoining market and town-hall. The ground-story will be of granite, and the upper portion of the street frontage of freestone. The corn-exchange, which will be placed to the rear, will be 70ft. by 25ft. Mr. Silvanus Trevail is the architect.

The chancel of the Episcopal Church at Kirkwall, Orkney, was destroyed by fire on Sunday morning, owing to an escape of gas ignited by the heating apparatus.

STAINED GLASS.

BIRMINGHAM.—Another two-light window in the north aisle of the New Church, Wretham-road, Soho Hill, has been filled with a subject in stained glass. The subject selected is from Matt. xix. 13, 14. It depicts, in the right-hand light, Our Lord, while in the act of receiving two children (who are bending before Him), rebuking His disciples for their endeavour to keep them from Him. In the immediate front is the mother of the two children, with her back to the spectator, gazing in adoring wonder at the act and words of Our Lord. To Our Lord's left is a group of children, one of whom is nestling in the folds of His robe, betokening the confiding and simple faith of a child. To the right-hand of Our Lord are the Apostles, Peter, James, and John, who evidently feel the rebuke, and a mother presenting her child for the Divine blessing. In the foreground are wild roses, lilies, and other flowers; in the middle distance and over Our Lord's head are trees, boldly treated, and between their trunks are seen the walls of a city and the evening sky. The subject is placed beneath a lily canopy. In the quartrefoil tracery an angel holds a scroll with the text: "Suffer little children to come unto Me, and forbid them not." The work has been executed by Messrs. Camm, Bros., of Smethwick, at whose establishment the whole of the other windows in the church were also produced.

BINGLEY, YORKS. — A two-light stained-glass window has just been erected in the old parish-church; the scheme of the design being an illustration of the "Te Deum," each light containing groups of figures representing respectively angels, apostles, prophets, martyrs, and the Holy Church. The principal piece of tracery contains the "Agnus Dei," and the smaller traceries the sacred monogram. Below the window is a handsome memorial brass to the children of Mr. S. Wildman, of Bingley, in whose memory the window is erected. The window and brass were designed and executed by Messrs. Shrigley and Hunt, John o'Gaunt's Gate, Lancaster, and 28, John-street, Bedford-row, London.

BUCKNALL.—A stained-glass window has been presented to Bucknall Church, and was unveiled on Christmas Day. It consists of the central light of the three east lancets. The subject is "St. Mary and St. John in contemplation of the Ascension." It is the work of Messrs. Camm, Brothers, of Smethwick.

HALIFAX.—The Wesleyan Church of St. John has been engifted with a handsome stained glass memorial rose-window, from the atelier of Powell Bros., Leeds. It contains four large figure-subjects, surrounded by ornament of a very rich description, both in colour and detail. The subjects are the calling of Samuel, Solomon building the Temple, Christ blessing little children, and St. Paul preaching at Athens. The wall-space beneath the window has also received some slight decoration from the same artists.

HEMINGBOROUGH, NEAR SELBY, YORKSHIRE.—A stained-glass west window (memorial) has just been erected in this fine old 15th-century church, some portions of which are of even anterior dates. The subject, which occupies the whole of the five lights, is "The Crucifixion," with some of its more salient accessory features. The notable feature of the treatment of this window, admirably suited to the tone of the surrounding architecture, is that it is in the style of, and reproduces the characteristics of, the celebrated York-minster glass. The artists are Messrs. Powell, Bros., of Leeds.

HODDESDON CHURCH, HERTS.—A two-light window has just been erected in this church. The subject selected by the donors was "The Sermon on the Mount." In the dexter light is a seated figure of Our Lord, surrounded by his Apostles, delivering his sermon to the multitude, which occupies the sinister light. Each subject is surmounted by a rich canopy. In the base, beneath small canopies, are seated figures of the four Evangelists. The tracery contains a floriated cross with the text, "Blessed are the pure in heart," &c. The window was designed and executed by Messrs. Shrigley and Hunt, John o' Gaunt's Gate, Lancaster; and 28, John-street, Bedford-row, London.

QUERNMORE CHURCH, NEAR LANCASTER.—A two-light stained-glass window has been placed in the church, containing two single figures of the Angels of the Resurrection bearing trumpets. The tracery contains the "Agnus Dei." The window was designed and executed by Messrs. Shrigley and Hunt, of Lancaster and London.

WYKE, YORKSHIRE.—A memorial stained-glass window has just been erected in this church, dedicated to the memory of the late Rev. C. W. Houlbrook, formerly vicar of the parish. The subject is from Matt. xiv., 30—viz., Peter, whilst walking to Jesus on the sea, fearing and beginning to sink, cries, "Lord, save me," which is the legend text in base. The window is from the studio of Powell Bros., Leeds.

STATUES, MEMORIALS, &c.

"A GOOD NAME IS BETTER THAN RICHES."—Under the above heading the *Exeter and Plymouth Gazette* for January 1st, 1881, says:—"As the last ray of sunshine in the expiring year streamed fitfully through the painted windows of the south aisle of Heavitree Church yesterday afternoon, it illumined momentarily the forms of the workmen who rested from their finished labour. On the wall of that aisle, near to its eastern end, they had just placed a mural tablet of pure statuary marble. The superscription thereon reads: 'Stephen Shute, 13 years a member of the choir of this church. He was—as a working statuary, singularly skilful; as a foreman, beloved by man and master; as a Christian, humble and sincere. Called away September 3rd, 1880, aged 42. This tablet was erected by one in whose service he died, and who mourns him as a brother.' The monument is a parallelogram measuring about 3ft. by 2ft. Its statuary marble slab is moulded and polished, and quietly enriched by incised ornament. Around the whole is a border of grey dove marble." Mr. Shute's almost sudden death from cholera, just after his return home from Belgium last autumn, was recorded in these columns at the time (Sept. 17th). A widow and nine children were left to mourn his loss, and for these a subscription started realised nearly £100. Amongst those who helped in the good work are the names of numerous architects and clergymen, with whom poor Shute (in his capacity of travelling-foreman for Mr. Harry Hems) came into contact with in different parts of the country, as well as not a few of his old operative friends. Amongst the latter are the clerks of works of two new cathedrals at present in hand—Mr. J. Willis, now representing Mr. G. Gilbert Scott, M.A., F.S.A., in that capacity at the cathedral building at St. John's, Newfoundland, and James Bubb, the clerk of works at Mr. J. L. Pearson's, R.A., new cathedral at Truro. It is possible that other of our readers who may not have already contributed may like to do so.

LEGAL INTELLIGENCE.

A BOROUGH SURVEYOR ON THE CHEMISTRY OF PLASTER. — ADAMS v. ARMSTRONG.—This claim, heard on January 13th before the County-court Judge at Margate, was for £10, balance of account in respect of the building of two cottages for the defendant.—The case was adjourned from last court day, when it was stated by the defendant that inferior mortar was used, and that, consequently, the walls of the cottages were damp. An adjournment was ordered, that the Borough Surveyor (Mr. Albert Latham, C.E.) might report upon the matter. The following report we take from the *Thanet Guardian* of the 15th inst. The Judge (to Mr. Latham): You have investigated this work, have you? Mr. Latham: I have, your Honour.—The Judge: And what is the result you have arrived at?—Mr. Latham: Do you wish me to report on the subject?—The Judge: If you please.—Mr. Latham: Generally? or specially as to the quality of the plaster? The Judge: As to the quality of the plaster and generally also. Mr. Latham: In company with the plaintiff and defendant, I took an opportunity of visiting the premises, and of obtaining samples of the plaster. The difficulty arises from the fact of the efflorescence of nitre, commonly called saltpetre, upon the surface of the plaster. The question is, "From what cause does this arise?" To my mind, from the presence of *salt in the work* and of *organic matter in the materials of which the plaster is composed.* The organic matter in the material was in the *shape of nitrogen;* therefore, we have salt, water, nitrogen, and atmosphere; and the result is that the *vapour crystallises* and is deposited in the *shape of saltpetre,* and has blown off or raised from the surface the wall-paper, which is practically destroyed. The Judge: Quite so. Mr. Latham: I have had given to me a copy of the agreement. I believe it is acknowledged by both parties to have been correct, and the fourth section says that the plaintiff "is to render and set all external walls with good hair-mortar." I have been told by Mr. Adams that, although this was the letter of the contract, there was also an implied contract that he was to use garden-mould. It is the presence of this garden-mould, together with salt, which has brought about all this trouble. The Judge: Quite so. Mr. Latham: Then comes the question as to whether the words "to be set with good hair-mortar" mean that it is to be of the best class of workmanship, or what is usual in cases of this class? The Judge: I shall put the latter construction upon it. Mr. Latham: It is a fair sample of work for cottage property. The Judge. Do you call the work average work considering the class? Mr. Latham: As a professional man, perhaps I am inclined the other way. There is hair in the mortar, but not so much as I should like to see in good work, and the setting is tender. The Judge: Quite so. Mr. Latham: I should say that the sample of mortar produced last court day is not a fair sample. The

Judge: Still, you say the work comes up to the conditions. Mr. Latham: I should hardly like to say so; but, having talked the matter over with the plaintiff and the defendant, I have come to the opinion that it would be advisable for them to come to a compromise in the re-papering of the house, which would cost about £4 each. The Judge (to the plaintiff): Are you willing to assent to that course? The plaintiff: I hardly agree, as I told the defendant it was too early to paper the walls. The paper has been blown off the walls by the damp. Mr. Latham: I don't agree with that, as the damp only would not cause efflorescence. The defendant: You have not reckoned the stair-walls. Mr. Latham: That will be £1 each. The Judge (to Mr. Latham): I am obliged to you for your valuable assistance and report. I shall adopt your suggestions as to the case before me. The plaintiff sues for £10; I shall give him judgment for £6. The plaintiff: And the costs, please? The Judge: The usual costs; to be paid in seven days.

A CLIENT'S DIFFICULTIES WITH HIS BUILDER AND ARCHITECT.—At Derby County-court, on Tuesday, before Mr. Woodforde, judge, the case of G. Pemberton *v.* F. Parkes was heard, in which £39 4s. 9d. was claimed for work done. Defendant is a medical galvanist, who, desiring to build premises in Burton-road, Derby, employed Messrs. Sheffield and Hill as architects, the work being performed by the latter. The contract was taken by builders named Birkumshaw, and on their failure a Mr. Bakewell was called by the trustee to complete the work; but after a time he declined to go further, and a difference arose between defendant and Mr. Hill, his architect. Plaintiff then took up the contract, and he set his men to work from the 3rd to the 10th May, for which £10 4s. 9d. was now sued for. An altercation then took place between plaintiff and defendant, and the former took his men away but defendant having called at his office, plantiff consented to recommence work, which reached the sum of £29, in addition to the sum already incurred. Plaintiff was referred by defendant for payment for the recommenced work to Mr. Hill, against whom defendant's counsel now made allegations of neglect. After a long hearing, it transpired that an action had been commenced against Parkes by the trustee for Birkumshaw's, the original contractors, and his honour eventually gave judgment of non-suit.

A CURIOUS VERDICT.—WORTHINGTON v. SUDELL.—This case was tried on Monday in the Queen's Bench Division (before Mr. Justice Bowen and a common jury,) and was brought by an architect to recover £151 as remuneration for preparing plans for repairing and rebuilding a publichouse in the Gray's Inn-road. It was agreed by counsel that the amount, if any, to be paid to the plaintiff should be £151, being 5 per cent. on the proposed outlay, and also some out-of-pocket expenses. The defence was that the plaintiff was instructed to prepare plans which would represent an outlay of from £1,500 to £1,800, whereas those which were prepared could not be carried out for less than £2,400. The plans were prepared in 1875, and no claim was made until five years afterwards. The explanation given for this was that the defendant had left the neighbourhood, and his address was not known to the plaintiff. The jury retired to consider their verdict, and when they returned the foreman said that the jury had agreed upon a verdict for the plaintiff for £45. His Lordship, however, explained to them that the parties had agreed upon the amount, and that he cou'd not take the verdict for the amount which they mentioned. They then retired to consider their verdict again, and in the result they returned and found a verdict for the defendant. His Lordship stayed execution.

ALLEGED INACCURACY OF CONTRACT PLANS.—An arbitration took place at Newmarket, on the 13th inst., in reference to the sewerage works in course of construction at Exning, between Messrs. Saint Brothers, of St. Ives, the contractors, and the Newmarket local board of health, the sanitary authority. In February, 1880, tenders were invited for levelling and draining about six acres of land for sewage utilisation. The lowest tender was accepted, that of Messrs. Saint, at £380, and the contract was entered into in due course, the contractors basing their estimates upon the plans and specifications furnished by the surveyors to the local board, Messrs. Clark and Holland, of Newmarket. Soon after the works had been commenced, it was discovered by the contractors that a larger quantity of work would have to be done than was anticipated by them when they estimated for the tender, and it was alleged by them that the plans and specifications supplied by the board were inaccurate. In accordance with a clause in the contract, the dispute was referred to two arbitrators and an umpire. The umpire appointed was Mr. Angel, architect, of London; while Mr. R. R. Rowe, of Cambridge, diocesan architect for Ely, acted as arbitrator for the claimants, and Mr. C. Pritchard, of Birmingham, civil engineer, was agreed to in the same capacity for the local board of Newmarket. The plans and specifications having been put in, the claimants called Mr. Pooley, civil engineer, of Cambridge, who deposed that the plans were inaccurate and misleading. Mr. Rootham, builder, of Cambridge, confirmed this evidence, and the Messrs. Saint detailed what had occurred between them and the surveyors to the board. On the part of that authority it was contended that inasmuch as the advertisement had stated how much levelling would have to be done, the plaintiffs ought to have known what they were about, and that if they had entered into an improvident contract it was their fault, and not the board.—Mr. J. F. Clark, of Newmarket, one of the surveyors to the board, gave evidence in favour of the plans. In cross-examination he admitted that certain transverse sections on the plans were incorrect. They had been made by a clerk in his office.—At the close of the inquiry the umpire and arbitrators announced that the award would be given on or before the 1st March.

A SURVEYOR'S CERTIFICATE NOT NECESSARY TO PROVE COMPLETION.—LEWIS v. HOARE.—This was an appeal to the House of Lords, on Tuesday, from a judgment of the Court of Appeal reversing the judgment, after trial, of Mr. Baron Huddleston. The action was originally brought by the respondent against the appellant upon a guarantee to the following effect:—"In consideration of your advance to Mr. Thick's authority of this date, I hereby promise to pay you £110 on completion of six houses, in accordance with a contract of this date between myself and Mr. Thick." It appeared that Mr. Thick was a builder, and that he had agreed to erect certain houses, for which he was to be paid on obtaining a certificate from the surveyor that the buildings were complete in accordance with the contract. The question left to the jury at the trial was, whether or not the houses could be said to have been completed before action brought, the builder not having received the certificate to that effect from the surveyor. The jury found that the houses had been completed as a matter of fact. Mr. Baron Huddleston, on further consideration, decided against the plaintiff, on the ground that the houses were not completed in accordance with the contract, the builder not having received the surveyor's certificate, and directed judgment to be entered for the defendant. The Court of Appeal reversed that decision, on the ground that the finding of the jury on the question of the completion of the houses was conclusive, and that the question whether or not the certificafe had been given did not arise. At the conclusion of the arguments, their Lordships (the Lord Chancellor, Lord Blackburn, and Lord Watson) affirmed the judgment of the Court below, on the ground that the form of the verdict made it imperative to hold that the jury found that the houses were actually completed in accordance with the contract in every particular except the actual issuing of the certificate. The issuing of such a certificate would not make the houses complete if they were not actually completed, and the withholding of the certificate would not make them incomplete if they were actually complete. The appeal must therefore be dismissed with costs.—Judgment affirmed, and appeal dismissed with costs.

IMPROPER BUILDING MATERIALS.—At the Edmonton Sessions on Wednesday, Andrew Nichols, builder, of Shacklewell-lane, was charged upon two summonses with violating the 106th bylaw of the Tottenham Local Board of Health, the material used by him as mortar in the construction of two houses in Deleview-road, Eastbournia, Stamford-hill, within the jurisdiction of the Board, not being of a character to solidly bind the bricks together. Mr. de Pape, surveyor to the Board, said he personally visited the houses on the 3rd of december, and took the four samples of mortar produced from the brickwork. He also gave notice that the walls were in a dangerous state, and they had been partially taken down. The samples were handed to the justices, who with the greatest ease crumbled the so-called mortar into dust between their fingers. The Bench ordered the defendant to pay £5 and a continuing penalty of 2s. 6d. per day for 40 days in respect of each house (£20 altogether) and costs, intimating that they were determined to assist local authorities in enforcing their bylaws.

A meeting of the local board of Bridlington was held last week, to consider the plans forwarded by Messrs. Brierley and Holt, civil engineers, to whom the premium of £100 had been awarded in a recent drainage competition. After two hours' discussion, it was decided to write to Messrs. Brierley and Holt, and suggest that the amount of tunnelling be reduced, with a view to reduce the cost of execution.

Mr. Eli Johnson, a sculptor of some repute, died at Northampton, on Friday last, of congestion of the lungs. His chief works were a bust of the late Mr. Charles Gilpin, and another of Mr. George Palmer, M.P.

Our Office Table.

THE death is recorded, at the age of 70 years, of the distinguished French architect, M. Hector Lefuel, who was born at Versailles. The pupil of his father, a capable member of the same profession, M. Lefuel early attracted notice by his diligence and accomplishments; he obtained the Grand Prix, first class, in 1829, and consequently studied at the Villa Médicis. He succeeded Visconti as architect to the Palais de Fontainebleau, and was employed to continue the works which united the Louvre with the Tuileries. In 1855 he was elected a Member of the Institute; and appointed Commander of the Legion of Honour in 1867.

THE Society of British Artists, having placed their fine galleries in Suffolk-street, Pall Mall, at the disposal of the Sunday Society, the Winter Exhibition, consisting of 945 paintings, 17 pieces of sculpture, &c., was opened to the members of the society on Sunday last between the hours of 5 and 7·30 p.m. On Sundays, January 23rd and 30th, the exhibition will be open to the public free by tickets, which will be issued by the Sunday Society to those applying by letter and sending a stamped and addressed envelope to the hononary-secretary, 8, Park-place-villas, W. This is the second time that the Society of British Artists have generously seconded the efforts of the Sunday Society.

THE death is announced of Auguste Edouard Mariette, better known as Mariette Bey, the archæologist of the modern school of Egyptology. M. Mariette was born at Boulogne in 1821, and began life as a teacher of grammar and drawing in that town, occupying his leisure in the unaided study of Egyptian hieroglyphics. In 1848 he was attached to the Egyptian Museum at the Louvre, and two years later he was first sent to Egypt on a scientific mission, the object of which was the search for Coptic manuscripts preserved in the monasteries of the country. Mariette found his way to Sakkarah, the ancient Memphis, and there began that series of excavations which will be for ever associated with his name. He discovered the site of the Serapeum, the temple and inclosure dedicated in ancient times to the worship and custody of the sacred bull Apis, as well as the long range of dated and inscribed tombs in which the bulls were buried, and which furnish a check and a verification of Egyptian chronology derived from independent sources. During his first visit to Egypt, Mariette also excavated the buried part of the Sphinx, and demonstrated anew the fact that that stupendous monument is hewn from the solid rock. Mariette remained some years in Egypt, and on his return to Europe was appointed assistant keeper of the Egyptian Museum in the Louvre. Returning to Egypt, he received the title of Bey, and was appointed by the late Khedive as Conservator of the National Monuments of Egypt and Keeper of the Museum at Boulak, an institution which may almost be called of his creation.

THE great success of the Nottingham Castle Museum of Art has encouraged art-lovers in Nottingham to form a society which now has something more than one hundred members. Its objects are the encouragement of art and the dissemination of art knowledge. Mr. S. Dutton Walker, F.S.A., is the hon. sec., and he has been very materially assisted by Mr. G. H. Wallis, the curator of the museum. Lectures have already been given by Mr. Wyke Bayliss, F.S.A., Mr. John Forbes Roberts, Mr. S. Bourne, and by Professor Marshall, of Leeds. Mr. Bourne's paper was most interesting, and described very graphically the dangers and difficulties which he encountered in his expedition for artistic purposes and for photography, in the mountain ranges of the higher Himalayas. After the lecture, Mr. Bourne exhibited his splendid collection of photographs, taken as above described. Other lectures are to follow, and the session will be wound up by a *soirée* at the Castle, when Lord Belper, the President, will preside.

IMPORTANT engineering operations are about to be carried out near the Lake of Constance by M. Honsell. The objects are, to keep the water of the lake from rising above, or sinking below, certain limits (showing a difference of level of

1·8m.), and to prevent future high waters giving a more abundant discharge than the present. The requirements of navigation, the security of the town of Schaffhausen, &c., necessitate this. The project in hand includes two operations: enlargement of the Stiegen channel (by means of wash-boards, so placed that the outflow there will not show an increase on the present till the water reaches their level); and regularisation of the bed by dredging, from the Stein bridge to a little below the confluence of the Biber, a distance of 5·575m. Full particulars of the scheme will be found in the *Archives des Sciences* of December 15.

CHIPS.

An inquiry was recently held at the Tolhouse, at Great Yarmouth, before Mr. Morgan, Local Government Board inspector, with reference to an application from the town council for leave to borrow the sum of £5,000, for paving various parts of the town with wood and concrete.

A new organ and choir-stalls, erected in Chellaston Church, Derbyshire, were used for the first time last week. Mr. Samuel Warren, of Derby, built the organ.

An enthusiastic demonstration took place at Hull on Saturday, in celebration of cutting the first sod of the Hull and Barnsley Railway and Dock. Messrs. Lucas and Aird, of Lambeth, are the contractors for the work.

The town-hall at Newbury has been altered and improved under the direction of Mr. J. H. Money, architect, of that town, by Mr. W. H. Simmonds, contractor, of Reading.

At Birmingham, on Monday week, Benjamin W. Smith, cashier in the employ of Messrs. Martin and Chamberlain, architects, was committed for trial on a charge of embezzling moneys, amounting to nearly £1,000, belonging to his employers.

The Local Board of Stapleton, next Bristol, decided, at a meeting held on Wednesday week, to carry out a complete drainage scheme for the parish, in accordance with a scheme and plans prepared by their surveyor, and at an estimated cost of £15,000.

A new school-house has just been built in connection with Holy Trinity Church, Aldershot; Mr. J. Seabright was the builder.

An inquiry was held on Wednesday week at Preston, Lancashire, before Mr. G. Thornhill Harrison, C.E., an inspector of the Local Government Board, into an application by the Preston Town Council for sanction to borrow the sum of £60,000 for public improvements. At the close of the inquiry the inspector said there appeared no objection to the sanction of the Local Government Board being given.

A new mission church for the North-end of Yarmouth was opened on Tuesday week. It is 84ft. by 26ft., and accommodates 400 persons. Mr. Newby was the contractor for carpentry work, and Mr. G. Nickerson, also of Yarmouth, for the brickwork. The cost has been about £580.

The School-board for the Forest of Dean received at their monthly meeting plans sent in by Messrs. Haddon Brothers, of London and Hereford, and others by Mr. Roberts, of Cinderford, for new schools for Steam-mills, near Cinderford. After a long discussion on the plans, a decision was postponed till the next meeting of the board. The estimated cost of Messrs. Haddon's plans was £900, and for those of Mr. Roberts £1,500.

Mr. Alfred Creer, who for nine years had been deputy borough engineer of Halifax, West Riding, was last week elected borough surveyor of Lancaster, from amongst 176 candidates.

The town council of Carlisle received last week a letter from the secretary to the Royal Archæological Institute, accepting, on behalf of the Institute, the invitation from the council to visit the city in 1882.

Mr. George Rice Jay, for many years borough surveyor of Maldon, died on the 13th inst., at the age of 77 years.

The town council of Hull, on Thursday week, decided to raise the salary of the waterworks engineer, Mr. D. Maxwell, from £350 to £450 per annum.

A Corporation report states the cost of the Temple-bar memorial to be £10,690 6s. 7d. Of this £5,260 is payable to Messrs. Mowlem and Co. for the foundations, scaffolding, granite work, masonry, carving and modelling; £2,152 to Mr. Boehm, R.A., for the statues in marble of the Queen and Prince of Wales; £1,081 to Mr. Birch, A.R.A., for the "Griffin" in bronze; and £1,603 15s. for the basso-relievos.

The annual exhibition of the Dublin Amateur Artists' Society was opened last week, and the newspapers of that city state that the standard of the work is much superior to last year. The judges, Sir G. Hodson, Sir Thos. A. Jones, P.R.H.A., and Mr. Thomas Drew, R.H.A., report that there is shown much careful study and observation of natural effects, and that they were particularly pleased with several studies of landscapes direct from nature, especially with No. 319. Regret is expressed that, as was the case last year, there has been no competition in figure subjects and heads. They award the prizes thus:—Section A: figure subjects and studies of heads—no awards. Section B: landscapes from nature (oils)—1st, Mary Kate Benson (secretary of the society); 2nd, Charlotte E. Benson; commended, Mary K. Benson. Do. (in water-colours)—1st, Mary Kane; 2nd, Charles D. Manley; commended, Dora Martyn and Edith Cane. Section C: animals—1st, not awarded. 2nd, Mary K. Benson; Section D: pictures from sketches (oils)—1st, J. M. H. Todhunter; 2nd, Mary K. Benson. Do. (in water-colours)—1st, Dora Martyn; 2nd, Edith Cane. Section E: flowers (in water-colours)—1st, Miss Godfrey. Section F: illustrations—no prize awarded. Special prize for study of distance, Mary K. Benson.

A new work, entitled, "Chapters from the History of Old Saint Paul's," by Dr. W. Sparrow Simpson, editor of "Documents Illustrating the History of St. Paul's" (Camden Society), is in the press, and will be published shortly by Mr. Elliot Stock.

A new aisle has been added to St. Peter's Church, Galashiels, which will accommodate 180 persons, the previous amount of space sufficing for 300 sitters. The cost was about £1,000

It was reported at the last meeting of the town council for Pembroke, that seventeen replies had been received to the advertisements of the council, offering the munificent premium of £25 for the best scheme for supplying the town with water.

The local board of Torquay last week received the sanction of the Local Government Board to the borrowing of £22,425 for the purpose of forming a new storage reservoir, and extending the water-supply of the town.

Mr. C. Wentworth Wass, who for more than 22 years has occupied the post of superintendent of the picture-gallery at the Crystal Palace, was last week presented with a testimonial consisting of a silver salver and a purse of 200 guineas on his retirement. Regret was expressed that this feature of the palace was likely, for financial reasons, to be discontinued.

Mr. Boehm is actively engaged upon a statue which is to be erected in Waterloo-place, as a memorial to Lord Lawrence. The site is south-east corner, and the size of statue, character of pedestal, are to correspond exactly with the memorial to Sir John Burgoyne, also the work of Mr. Boehm, which stands opposite.

New parochial infant-schools for St. Mary's, Lambeth, were opened by the Archbishop of Canterbury, on Monday week. The building adjoins Lambeth Palace, and is of red brick; it is planned as a large hall, with class-rooms at each end. The cost has been £2,750, and accommodation is provided for 270 children. Mr. J. P. Seddon was the architect.

The parish-church of East Carlton, Norfolk, was opened on Thursday, the 13th inst., after restoration, including a new roof, extensive repairs to walls and windows, and entire reseating.

A stained-glass window has just been placed in the Abbey Church of Romsey, Hants, representing Christ leading the Blind Man.

A mission-chapel is about to be built for the hamlet of Wick, near Lyminster, Sussex, Mr. W. Street is the architect; the building is to seat 200 people at an estimated cost of £1,000.

A new post-office and other buildings have just been erected at Haverfordwest, for the trustees of Sir John Perrott's Charity. Messrs. Morgan and Thomas were the builders.

New business premises, built for the Accrington and Church Industrial Co-operative Society (Limited), at Antley, Accrington, were opened last week. The joiners' work has all been executed by the men in the Society's joinery department, under the direction of Mr. G. A. Whiteside, foreman, and the rest of the work was let to local contractors. Mr. Henry Ross, of Accrington, is the architect employed by the Society.

Lamplough's Pyretic Saline is refreshing, most agreeable, and the preventive of FEVERS, BILIOUSNESS, SMALL POX, SKIN DISEASES, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill. *Use no substitute.*—[ADVT.]

Holloway's Pills thoroughly purify the blood, completely cleanse the lungs, reinvigorate debilitated or vitiated nervous action, strengthen the muscles, and clear the brain. These excellent Pills are particularly recommended to all persons whose occupation is sedentary or conducted in close rooms, and to the nervous, dyspeptic, and the low spirited.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—London Institution. "Problems in the History of Civilisation." By Dr. E. B. Tylor, F.R.S. 5 p.m.

WEDNESDAY.—Society of Arts. "Suggestions for Preventing London Smoke." By W. D. Scott-Moncreiff. 8 p.m.

THURSDAY.—Society of Arts. "A New Mechanical Furnance and a Continuous System of Manufacturing Sulphate of Soda." By Jas. Mactear, F.C.S. 8 p.m.

London Institution. "The Manufacture of Indigo from Coal." By Prof. H. E. Armstrong, F.R.S. 7 p.m.

Society for the Fine Arts. "Book Decoration." By J. W. Bradley. 8 p.m.

SATURDAY.—St. Paul's Ecclesiological Society. Annual meeting. 2 p.m.

Throat Irritation.—Soreness and dryness, tickling and irritation, inducing cough and affecting the voice. For these symptoms use Epps's Glycerine Jujubes. Glycerine, in these agreeable confections, being in proximity to the glands at the moment they are excited by the act of sucking, becomes actively healing. Sold only in boxes, 7½d. and 1s. 1½d., labelled "JAMES EPPS and Co., Homœopathic Chemists, London." A letter received: "Gentlemen,—It may, perhaps, interest you to know that, after an extended trial, I have found your glycerine Jujubes of considerable benefit (with or without medical treatment) in almost all forms of throat disease. They soften and clear the voice. In no case can they do any harm.—Yours faithfully, GORDON HOLMES, L.R.C.P.E., Senior Physician to the Municipal Throat and Ear Infirmary."

Trade News.

WAGES MOVEMENTS.

NORTH WALES SLATE TRADE.—The slate trade of North Wales still continues very dull, and although notices have been given of an extension of full working time at the Oakley quarries, Festiniog, several of the smaller quarries remain closed. The adoption of the Employers' Liability Act threatens to give rise to some trouble. Mr. Assheton Smith, the owner of the Llanberis quarries, has notified to his workmen that in the event of their refusal to contract themselves out of the Act he shall reconsider the arrangement under which he supports the quarry hospital and allows pensions to widows of men killed in his employment. The matter has been referred to the North Wales Quarrymen's Union, the Council of which, after receiving statements from most of the quarries comprised within the district of the organisation, have decided upon recommending the men to adhere to the original resolution arrived at, and not to contract themselves out of the Act.

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Superior to Earth Closets. For Gentlemen's Houses, Cottages, Schools, &c.
NO DRIED EARTH REQUIRED.
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Doulting Freestone and Ham Hill Stone of best quality. Prices, delivered at any part of the United Kingdom, given on application to
CHARLES TRASK,
Norton-sub-Hamdon, Ilminster, Somerset.
—[ADVT.]

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General Repairs and Alterations Executed.
Experienced Workmen always in readiness, and sent to any part of the country.—[ADVT.]

BATH STONE.
SUMMER DRIED,
CORSHAM DOWN,
100,000 Feet Cube.
PICTOR & SONS, BOX, WILTS.
[ADVT.]

TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender—it adds to the value of the information.

EXETER.—For new factory, Fore-street, Exeter, for Messrs. Lloyd and Son. Messrs. C. Shoppee and Sons, 22, John-street, Bedford-row, London, architects. Quantities supplied by Mr. H Shoppee:—

Brass, London	£12,478	0	0
Pethrick and Co., Plymouth ...	10,984	0	0
Stephens and Sons, Exeter ...	10,484	0	0
Jones and Co., Gloucester ...	10,290	0	0
Clark	10,269	0	0
Claridge, Banbury...	10,095	0	0
Stephens and Bastow, Bristol* ...	9,859	0	0
Brand and Co., London	8,300	0	0

* Accepted.

THE BUILDING NEWS.

LONDON, FRIDAY, JANUARY 28, 1881.

THE GOOD AND BAD OF THE SEMI-CLASSIC REVIVAL.

BY the "semi-Classic revival" we mean, of course, the revival of what is commonly, and inaccurately, called the "Queen Anne" style: that half-English, half-Dutch mode of building which seems to have come into fashion round London in or before the reign of William III., and which lingered on till domestic architecture, properly so-called, almost died out amongst us. From the middle of the 18th century till now, plenty of architecture, better and worse, has been applied to domestic buildings of the more expensive class; but the greater part of it has not really been domestic architecture at all. There has been no everyday style, no prose style, no style for common purposes. Nearly everything that pretended to style at all has been put into a monumental style, or a sham monumental style. While the temples of Greece, the palaces of Rome, and the churches of Mediæval Europe have been ransacked to furnish bits of detail for the adorning of city shops and middle-class villas, we have even been assured by those eloquent writers about art, who are so much more abundant in our times than in those when art grew and flourished, that all this is as it should be, and that our only fault lies in not carrying the process far enough. We ought, it appears, to have gone a stage further, and not only to have filled our house-fronts with pointed arches and window-tracery; but to have covered our rooms with cross-vaults in brick or stone, if there was the least intention of making them truly Gothic. Similarly, no doubt, we should never build so much as a cottage without stone lintels and cornices, if we wish our work to be truly Classic; for the Classic-temple style is as essentially based on stone-lintel construction as the Gothic-cathedral style is based on arches and vaulting. It is this sort of teaching, by the way, which led to all the horrors of stucco and sham-fronts,—two devices to get the effect of monumental architecture without its cost; and it is this teaching which has made the most beautiful thoughts of bygone artists trite, if not repulsive, by the perpetual mixing-up of them with the vulgar and the sordid. But is not monumental architecture (people have asked) the highest class of architecture? and when we can copy the highest, why should we, for any purpose, copy anything lower? Is not poetry (it might be answered) the highest class of literature? Why, then, on your principle, should not all literature be poetical? Monumental, or as it might almost be called, rhythmical architecture, is the poetry of building, and the man who feels no incongruity in applying it to shops and banks and warehouses, ought to feel no incongruity in a rhymed *Daily News* or a blank-verse *Times*.

One of the strongest points in favour of the revived semi-Classic is, that it is a reaction against all this misplaced monumentalism. It is an admission that the common-sense of the world is right, when it says there ought to be a radical difference between a cathedral and a cottage. It is a return to a prose style for prosaic subjects, and to a slight and relatively temporary style for slight and temporary purposes. Such purposes there always have been, and always will be, and it ought to be possible, now and here, as well as in other times and distant places, to fulfil them artistically. We have heard plenty of declamation against short building leases, and should be glad enough, were it practicable, to see them done away with. Permanence is a good thing when it can be had; but it cannot be had everywhere, and the architect's business is to do the best under the actual conditions he meets with. To-day he may be dealing with some great national work, meant to last for ages; and to-morrow with some trifling structure likely to vanish before the next generation; the problem is to make both of them fulfil their purpose the more satisfactorily while they last. To do this, the two subjects must be treated very differently in all respects. It is not monumental Gothic alone that does not lend itself with fitness to shops and cottages; it is the monumental phase of every great style that ever existed. We do not get much ocular proof of this amongst the remains of past styles—for the plain reason that the permanent in them has endured, while the temporary, with a few chance exceptions, has passed away. A moment's thought, however, will show that it must have been so. The wildest dreamer of all the dreamers who for the last fifty years have taken upon themselves to direct the workers amongst us, could not imagine that the Egyptian people ever lived in houses constructed as the Egyptian temples were. But ought some art-prophet thereupon to have stood up and testified against them? Should he have said, "It is of no use your trying to build in the Egyptian style, unless you adopt the very same construction all through your dwellings, which you see in the temples?" They built, no doubt, in a very temporary way, with no sort of attempt at the same class of construction; and yet, in an unpretending manner, it is easy to believe that their temporary works harmonised with and gave added dignity to, the almost eternal structures beside them. So it was with the Greeks—so with the Mediæval builders; so it is with the Mahometans almost down to this day. There is, and there was with all, a monumental way of building for monumental purposes, and a temporary or half-temporary way for ordinary ends; a noble vein of poetry for adequate occasions, and a good honest sort of prose for daily life. This is one of the most essential things which the leaders of the semi-Classic revival have recognised, or, to speak more truly, have only half-recognised, as yet.

If there had been existing amongst us a multitude of precedents showing what the early Gothic builders thought suitable for temporary structures, such as those we now have to provide for in London, the Gothic architects of to-day would doubtless have copied these, and not the later ones. Very few such precedents exist, and, for the most part, few ever did exist: since in Mediæval times not one in a hundred of the special requirements of our age had any place at all. The right and consistent course for architects who adopt Early Gothic as their style for permanent works would clearly be to devise another phase of that style for temporary and subordinate works. But while architects are, unhappily, all separated, with every man's hand against his brother, it is out of the question to devise either styles or phases of style. Styles, of necessity, have to be devised by a multitude of artists working together; and all that an isolated artist can do is to work with all the power he has in such styles as already exist. Hence, it will not do to blame too much the isolated artists of our day, because, when prevented by their isolation from developing the phase of Gothic which is wanting, they have fallen back on a phase of mongrel Classic. It is a way of building adapted for ordinary, half-temporary uses, and that is its strength; but it is also a way which harmonises ill with the higher phases of either Gothic or Classic, and that is its weakness. We may, therefore, be said to have once more, as of old, two style-phases, the monumental and the temporary, the poetical and the prosaic; but the misfortune is that the two do not now, as they did and should, harmonise together. Hence we speak of the want having been only half-met, the problem only half-solved, the necessities of the two style-phases only half-recognised as yet.

Another weakness of this revived semi-Classic is, that it does not really know how to deal with any materials but brick and wood. The North and West of England, the great freestone and rubble-stone districts, can, as it stands, hardly turn it to any account. No doubt some architects will get over the difficulty by building in Yorkshire, for instance, just as they would build in London. A man who cannot adapt his ideas to the materials at hand has nothing for it but to adapt the materials to his ideas, and may save himself the trouble of thinking how to make the best of local conditions by putting his client to the expense of bringing bricks and tiles from a distance. This, however, even apart from the doubtful honesty of it, will seldom give satisfactory results. One great charm of good architecture is, that it seems to grow out of its site, to harmonise with its surroundings, to be a part of Nature; and this a brick building in a stone country very rarely seems to be. In the midst of a large town it may pass, for the surroundings then are artificial; but in the country, with rocks and quarries about it, and flagstones, it may be, peering through the turf at its base, the absurdity of importing bricks is a little too glaring. The architects in our stone districts are, however, more fortunate than their contemporaries elsewhere. They have already, if they would have the wisdom to use it, a domestic style far more in harmony with monumental Gothic than is the semi-Classic of 17th-century London. In those districts Gothic traditions have hardly, even yet, quite died out; and we may see what the later Mediæval builders, at least, were accustomed to work in as their everyday style. This, no doubt, needs modification; it is far enough from being a ready-made solution of all our modern difficulties, or a complete model for the cheapest and most temporary of modern structures. But it comes nearer to this than any, save a very few, of those examples in the brick and wood district of England which show a similar amount of Mediæval feeling. The semi-Classic revival, therefore, has no right to spread into places that can so well do without it, and that indeed can so ill do with it. It is a makeshift which we in London may be pardoned for availing ourselves of till we can find or develop something better, but one which we should be far from thrusting on others who have already the germ of a "prose style" incomparably superior. Yet there can hardly be a more palpable or lamentable proof of the helplessness of isolated artists in the matter of building-style, than this very confession. When the same Gothic types are followed for monumental works all over the kingdom, we are driven to advocate as the best thing possible, under the circumstances, the adoption of two other quite distinct styles for temporary and everyday works—one for brick districts, and another for stone ones; and we are driven to this because experience has shown that architects, while they are isolated, may work fairly in old styles, but are almost powerless in devising new ones. Still, as nothing is quite perfect in this world, the present isolation of architects is not absolute and complete; and the measure by which it falls short of being so, is the measure of what can be done in

modifying and giving vitality to the revived semi-Classic. Such mutual helpfulness as there is goes on chiefly through the agency of the professional journals, by which every architect can see what almost every other architect has contributed from time to time towards the solution of the problems which all are concerned with. The Association lectures and the Institute papers have their value,—though the latter society seems to become more and more a business one, and to have few very brilliant suggestions to offer, even from a business point of view. But, after all, the way to study art is to look at it and work at it—not to talk about it and hear about it; and thus illustrations, as being by a long stage nearer to the realities than mere descriptions are, will always take decided precedence of them. So, by one means and another, the revived semi-Classic of our day does show some slight departure almost everywhere from its original form. A modern "Queen Anne" house differs perceptibly enough in most cases from anything that was done in the reign of Queen Anne or her predecessors, and it differs very often in the right direction. Indeed, the final merit which we refer to in the style in question is its great and almost unexampled fitness for modification. Architects may well hesitate to touch the perfect Gothic, or the perfect Greek, by way of alteration; and almost every minor style has a sort of organic oneness about it which makes successful interpolations difficult. It is the crowning glory of the revived semi-Classic, on the other hand, that no one need despair of making it better. Its detail can hardly be worse, and so far it is emphatically the "*corpus vile*" on which, as we have all been taught, experiments should be made.

THE WEATHER AND THE BUILDERS.

THE recent severity of the weather has not only stopped building operations, but put to a severe test the capabilities of those contrivances upon which the art of good building depends. The contractor who has undertaken to complete work has been obliged to take advantage of the clause in his contract which suspends the operation of penalties for non-completion on account of the inclemency of the weather, if he has not already become a loser by the external forces he has had to contend against, causing dislocated walls, fractured stonework, the destruction of mortar-joints and plastering, burst pipes, and a variety of other disturbances. The check to building operations which have only advanced so far as to be still in the hands of the bricklayer is serious enough to create some apprehension in the minds of those who have taken contracts at a low price, though, if the lesson of care and caution is heeded which such a check brings with it, the unusual stress of weather has not been without a salutary effect. But a severe season has a far more reaching application, especially to the large section of the public who build and occupy new houses. It becomes an exacting test of material and workmanship. Even the most substantially-built house must have suffered in some form or another. We are afraid to contemplate the results of the frost and driving snow in the case of the many thousands of new houses which have recently been built and occupied, and especially when the frost abated and the breaking-up commenced. To begin with the roof, it would be an instructive inquiry to discover the percentage of water-tight roofs when yesterday's thaw began. The roof may generally be taken as a pretty sure test of the quality of the house in other respects, though the best-covered roofs are not invariably exempt from the driving of fine snow between the slates or the consequences of a thaw in a confined gutter. The custom of having parapets, which the builder still clings to, despite its manifest evils, increases the risk of an overflow, and invites the accumulation of snow against the front wall, which forms a good lodgment. When the thaw begins the wall becomes saturated with moisture, and the tenant may have to contend with two forms of evil—the leakage through crevices into his ceiling, and a wall sodden with liquefied snow. The gutters get clogged by the drift, and instead of becoming the channels of discharge are converted into troughs, which fill and become a never-failing source of trouble in snowy weather. The change from Classic to Gothic led to the adoption of a more sensible form of roof which the Queen Anne style of building has retained; but, unhappily, architectural style has been as blind to the necessities of climate, as the more arbitrary mistress Fashion in the matter of women's dress. The idea of a roof which shall throw off the rain and snow beyond the walls is in theory a very easy matter; but somehow the architect, in his endeavour to turn it into a picturesque feature, manages to defeat the main object, either by placing two gabled roofs in awkward proximity, or making flats and gutters, where the principal fall would naturally take place. In not a few roofs the architect has done the very thing the hydraulic engineer would do if he wished to form a catchwater basin or a reservoir. He places a huge dam in the shape of a roof right across a valley formed by the slopes or sides of adjacent roofs, thereby penning up the water, and he carries a blind gutter through the obstruction as a relief. What a makeshift! It is nothing but a contrivance to get over a blunder. One often sees a chimney on an outside wall carried up above a roof. When a snowfall occurs a mass of it rests against the chimney, soaking into the warm brickwork and finding its way down appears as damp spots in the ceiling of the bedroom below. The remedy for this is unquestionably a small steep roof with ridge constructed across the angle, the sides of which would throw off the snow on either side. An ordinary gutter is seldom efficient. The ridge connecting the stack with the main roof also helps to support and steady the former. In a letter to the *Times* last week, Mr. Latimer Clark makes a very useful suggestion to prevent melted snow from overflowing the gutters and flooding the rooms below. It is briefly to place inverted troughs of wood or iron, or a simple V-shaped trough with apex upwards along the gutters, so that when the snow melts the water is freely conducted away by the gutters.

We hear of numerous instances of the penetrability of the fine drift-snow of the recent storm, and of many roofs in the metropolis and elsewhere it has found its ways through. Buildings with steep Mansard roofs and parapets have suffered to a great extent owing to the choking up of the gutters, though the least desirable angle seems to be that which is flat enough to afford a resting place for large masses before they begin to slide off, and the wind has more chances of raising the slates of flat roofs. The suggestion of covering the gutters by two inclined boards leaning together at the top is a good temporary remedy; but we might ask why builders do not provide some more permanent form of protection over gutters, into which a large surface of roofing discharges? Movable galvanised wire netting that could be taken off in sections, would be an inexpensive and effectual barrier if placed over these channels. It is needless to say that common tile roofs, if too flat, or the tiles are not laid with a close good lap, are very exposed to the drift of fine snow, and we hear of a church recently built in the suburbs, into which the snow has driven between the tiles to such a degree that the aisle is rendered useless. In specifying roofs of this description great care is necessary to obtain truly-made tiles, and to require close-fitting or pointing in the laying; but when architects have the choice of improved tiles such as the Broomhall Company's, and other forms of Italian tiles, it rests with them whether a perfect roof is the result or not. When snow melts it begins to slide down roofs, and in the case of buildings without parapets some inconvenience, if not damage to glass conservatories, may be experienced by avalanches from lofty buildings—a good reason, it seems to us, for a steeply-inclined roof. One suggestion is to arrest masses of snow, by inserting short pieces of galvanised hoop-iron under the slates at intervals, the ends being made to turn upwards.

These observations lead us naturally to a question which has always taxed the ingenuity of architects and plumbers—namely how to render skylights water-tight. It is not too much to say that an effectual skylight is more the concurrence of good workmanship and favourable conditions than design, for a well-planned method of hingeing the lights, and forming well-grooved rafters and water-tight rails may be rendered completely abortive by the carelessness of the joiner or plumber, in fitting or in dressing the lead round the kerb. A wooden skylight is, moreover, subjected to the most trying circumstances. Alternately wet and dry, scorched by a hot sun, or sodden with moisture, few parts of the joiner's work are apt to decay so soon. These conditions require the most seasoned materials; but in actual house-building perhaps less regard is shown, in this respect, than for other more visible specimens of the joiner's work. The consequences are soon apparent. Either the kerbing shrinks, loosening or otherwise cracking the lead, the sashes become warped, and do not closely fit, or the shrinkage of the stiles and rails leave openings which admit rain on every occasion. Natural decay sets in, and completes the work of destruction. The inconveniences and discomforts arising from wooden skylights are chiefly due to the parsimonious manner in which speculative houses are built. Instead of 2in. or 2½in., they are seldom more than 1¼ or 1½in. thick; no capping is provided to cover the joints, no tongues are introduced, and the glazing is imperfectly performed with putty which is constantly giving way through shrinkage. Of course, metal skylights avoid many of the risks to which wood is exposed; but to all skylights there is the objection that the first heavy snowstorm throws the hall, staircase, or landing of the house in darkness, or shuts out the light from any room which is lighted entirely by its aid. During the past week, many of our railway-stations were obliged to be lighted by gas during the day owing to the late snowfall; but in the case of a skylight, surely the skill of the architect or builder might be called upon to devise some outer protection in the form of a steeped-pitched open-metal grating or net, to throw off the snow as soon as it falls without obscuring the light; and it is remarkable that the perversity of the building craft is such that an outer skylight is often of lower pitch than the surrounding roofs.

Of walls, it is unnecessary to say more than that the builder very often renders them damp and cold by adhering to the old-fashioned idea of having solid walls where hollow-constructed ones would be better for every sanitary reason. In stone districts, where good rubble walling can be had and solidity is not grudged, a solid wall may secure all that is required; but it is a miserable stickling for traditional usage to build thin solid walls of porous brick, and afterwards try to stay the inroads moisture and cold produce. With

these observations we pass on to allude to a few of the commoner defects found within the house. That wonderful specimen of human ingenuity, the modern sash window, is by no means an infallible check to driving wind, rain, or even snow, as many of our new houses have found to their cost within the last few days. Here the art of the architect has done really little to abate the evil. When we have no cold air pouring upon our heads in our parlours or studies, we have a deluge of rain that enters, or small heaps of driven snow, which accumulate in the crevices of the sashes, and pile themselves up in the corners of our windows. On the outside of the window the flat sills form shelves for the snow to lodge till small mountains and ridges appear, but these are harmless compared with the deluge of condensed water which greets our eyes after a sudden fall of the outside temperature. It is useless to inquire if we have remedies for these things. As violent snowstorms only happen once or twice in a generation, the modern house-builder does not trouble about the precautions of extra thick sashes, weather-bars, or grooved and tongued stiles. Everyone knows the value of a double window; but it is an item of cost that tenants are not prepared to pay for, so builders and those they build for are content with the usual sash window with its numerous shortcomings. How mercilessly inefficient some of these fittings are has not perhaps been so fully tested till the other day, and it is certainly cruel irony which points to these deficiencies in some of the better buildings of the metropolis, where the skill and experience of the best artificers are supposed to be centred. It is true, indeed, that the modern architect can provide against these things: he can specify close-fitting sashes, grooved and tongued rebates, weather-bars and draught-preventers; yet by the strange coincidence of modern contract work and machine-labour, all the theory, all the workman's care in operating is thrown away. Competition has brought with it the produce of inferior timber-markets and the artlessness of mechanical labour. The most skilled workmanship is baffled by shrinkage of timber, and the most consummate contrivance may be frustrated by ill-judged conversion of timber. There are a score of other minor defects, which a severe frost opens up. The plumber and the builder are now busy in arresting the flow of water caused by the bursting of pipes, in patching up roofs, gutters, and skylights. In view of the present breaking-up of frost, we may call attention to a few useful suggestions made by the writer we have already referred to. Pipes buried in the ground are safe from frost, but where, as in areas, cold passages, &c., they are exposed, the author proposes the very simple precaution of "inserting within the pipe a small thin tube of guttapercha or indiarubber, containing air, sealed at the ends, and extending the whole length of the pipe. It may be held in position at intervals by copper wires brought to the outside at the joints and soldered in with them." The taps of hydrants for watering gardens should be buried 2ft. in the ground, the handle for turning the tap and the delivery pipe being brought up to the surface. Screw-taps are better, as they shut off the water gradually, and avoid the sudden blow caused by the common plug taps. Another hint to prevent the bursting of hot-water boilers is worth remembering, and that is to draw off a quart of water from the boiler before lighting the fire. If this can be done the pipes are not frozen, and the fire may be lighted with safety; but this precaution ought only be a supplementary one to a safety-valve. Builders and architects would earn the respect of their employers and the public if they bestowed a little care and thought on these matters.

SPECIFIC GRAVITY OF BUILDING MATERIALS.

IF we take in our hands equal bulks, a cubic inch for example, of two different solids, such as marble and lead, we at once perceive a great difference in the pressure produced upon each hand, or, as we should say, one cube feels much heavier than the other. There is, in fact, a greater mass of particles of matter condensed in the cube of lead than in the cube of marble, owing to those particles being more closely packed together, so that bulk for bulk lead is heavier than marble. In order to have an exact or scientific method of comparing the densities of various solids, we adopt the weight of an equal bulk of water as the standard unit, and compare all other solid substances with it. Thus, if we find that a cubic inch of lead weighs as much as $11\frac{1}{2}$ cubic inches of water, we call $11\frac{1}{2}$ the "specific gravity" of lead, its density being $11\frac{1}{2}$ times that of water.

The celebrated philosopher, Archimedes, appears to have been the first to have had his attention called to this mode of comparing the densities of different solids. The King of Syracuse having given a certain weight of gold to a workman to make into a crown, he returned him a crown having the full weight of gold delivered to him; but suspicion being afterwards aroused that it had been alloyed with silver, the king referred the matter to Archimedes, who, while cogitating over the problem, happened to notice that when he stepped into a bath full of water a quantity of water *equal in bulk to his own body* flowed over before he could immerse himself. It then occurred to him that, if he immersed a mass of pure gold of equal weight to the crown in a vessel full of water, and observed how much flowed over, and then did the same thing with the crown itself, he would be able to see whether the latter occupied more space than the mass of pure gold, and thus detect the quantity of silver used to alloy it, as gold is nearly twice as heavy as silver for equal bulks, and therefore the crown would be of proportionately greater bulk. The specific gravity then of any solid is its weight as compared with that of an equal bulk of water, distilled water at 60° Fahr. being used as the standard of measurement.

Specific gravities of solids might, no doubt, be determined by making exact cubes, say, 1in. each way, and weighing them against a cubic inch of water, but this would be a troublesome and inexact process, as we often require to know the specific gravity of irregularly-shaped bodies, and it is, moreover, rendered unnecessary by the following hydrostatic law that "a body immersed in a fluid is pressed upwards with a force equal to the weight of the fluid displaced"; from which it follows that if we weigh a heavy body in water, by attaching it to one side of a balance and allowing it to sink in the water, it loses in weight exactly that of an equal bulk of water; so that the weight of the body as taken in air, minus its weight in water, is the weight of an equal bulk of water. If, then, W is the weight of the solid in air, w its weight when immersed in water, we have

$$\text{Specific gravity} = \frac{W}{W - w}$$

We have here supposed the substance to be heavier than water; but in the case of most woods which float in water, in order to find their specific gravities we must attach a heavy material, sufficient to sink the specimen below the surface of the water. Call P the substance whose specific gravity is sought, Q the weight employed to sink it, and let w_1 be the ascertained weight of Q when weighed in water, and w the weight of P + Q in water; then we have—

$$\text{Specific gravity of P} = \frac{W}{W + w_1 - w}$$

To find the specific gravity of a compound or alloy of two metals, we must know the specific gravity and volume of each component; let S and s be the specific gravities, V and v their volumes; then we have—

$$\text{Specific gravity of alloy} = \frac{VS + vs}{V + v}$$

Having thus briefly described the manner in which the specific gravity of any solid body (not soluble in water) can be ascertained, we now propose to consider the subject in its bearing upon the utility of materials used for building purposes. We have seen that the specific gravity of a body varies with its density, or the closeness of its particles to one another; now it has been generally observed that the durability and cohesive strength of materials are in direct proportion to their compactness or density, a heavy stone or one of high specific gravity being usually stronger and more durable, *cæteris paribus*, than a lighter one, in which the specific gravity is low. This arises chiefly from the lighter material being more porous and absorbent than the heavier, and therefore possessing less power of resistance to pressure, as well as being more easily acted on by water getting into its pores, and either dissolving a portion of the substance, or freezing in winter and splitting the stone to pieces by the expansive force developed in converting water into ice.

In selecting a stone for building purposes it is therefore desirable to ascertain its specific gravity, as even a slight variation in two stones of similar chemical composition will often make a great difference in their relative durability. We have a remarkable instance of this in the case of the magnesian limestone employed for the external facing of the Houses of Parliament at Westminster, where the Bolsover stone was first used, which has a specific gravity of 2·43 (water being unity); but the quarries of this stone being worked out, a stone of specific gravity 2·3 from Anstone was substituted, the decay of which, when exposed to weather, was very rapid, as compared with the Bolsover stone, although the chemical composition was almost identically the same in both. The difference of cohesive strength in the two kinds of stone, when subjected to a crushing weight, is also very conspicuous, being in the ratio of 117 : 83. Again, the magnesian limestone from Cadeby, whose specific gravity is 2·0, is very absorbent of water, and possesses a low degree of cohesive strength. There are, however, occasional exceptions to this rule, as the magnesian-limestone of Bramham-moor has a specific gravity only slightly higher than the Cadeby stone, but is much less absorbent than some of higher specific gravity; and is also possessed of considerable cohesive strength.

With regard to sandstones, the same rule may be said generally to hold good where the chemical composition is similar, but as this latter varies considerably in different stones, we cannot always draw correct conclusions merely from a knowledge of their specific gravities. Thus Cragleith-stone, which is nearly pure silica, has great crushing strength, and moderate absorbent power; but Park-spring stone, which has a higher specific gravity, has less cohesive strength, but is at the time less absorbent, the chemical composition of the two being different. Kenton sandstone has also a high specific gravity, but it is very absorbent, and has a low crushing strength, the amount of silica in its composition being much less than in the above-named stones; and Heddon stone, which is much lighter in weight but contains more silica, is much less absorbent, but has a less crushing strength, and its power of resistance to weather is also small. Morley-moor stone, from the neighbourhood of Derby, has a very low specific gravity, accompanied with high absorbent power and but moderate cohesive strength.

In the case of the Oolitic limestones, the

rule which has been laid down will be generally found to hold good, those from Ancaster and Portland, which have high specific gravity, being the least absorbent, strongest, and most durable. The stone from Portland, however, has a higher crushing strength, owing probably to its containing a small proportion of silica, which is absent from the composition of other English oolites. Among the different varieties of Portland stone, the most durable are those which have the highest specific gravity, that obtained from the top bed being heavier, stronger, and more durable than the stone from the lower bed in the same quarry. Bath stone has, generally, a low specific gravity, combined with but moderate crushing-strength, and being highly absorbent, its power of resisting weather is but small. Some kinds of this stone, however, have much greater durability and strength than others, and generally in proportion to their specific gravities. In other limestones which are not oolitic, the rule holds good, the siliceous limestone of Chilmark having a high specific gravity combined with great resistance to crushing, and low absorbent power, which qualities render it a valuable building material where strength and durability are desired.

Metals differ so greatly in character one from another that it is difficult to draw comparisons between their specific gravity and other qualities; thus gold has a very high specific gravity, and is at the same time the most malleable and ductile of metals; it is also possessed of the greatest power of resistance to the action of acids, and is unaltered by exposure for any length of time to atmospheric influences; while on the other hand zinc, which is about one-third of the density of gold, possesses but little ductility, and readily oxidises when exposed to the air. Such comparisons, however, are of little value as between separate metals; it is by comparing different specimens of the same metal that we discover the value of ascertaining their specific gravity. Thus, for example, we find that cast-iron has an average specific gravity of 7·12, and is very brittle, being liable to fracture by a sharp blow, although it will at the same time bear a very great crushing weight; while wrought iron, whose specific gravity averages 7·68, has rather less crushing-strength, but will bear almost any amount of hammering without being fractured.

Again, if we take two different specimens of cast-iron, we shall find that the one possessing the highest specific gravity is invariably the stronger, and this arises from the particles being more closely packed together, as well as from greater uniformity of texture, since castings are very liable to be honeycomed from unequal shrinkage in cooling, which renders them weak and brittle. In some of the cheap castings in iron, a large proportion of carbon is mixed with the metal, which reduces both its strength and specific gravity, rendering it extremely brittle, and almost useless as a building material that is liable to strain of any kind. The way to test the soundness of metallic castings is to take their specific gravity, which might easily be done by weighing them in a tank of water; had this been done in the case of the first great bell (Big Ben), which was cast for the clock-tower at Westminster, the porosity and inequality of the casting would at once have been detected, and the expense of taking down and re-casting the bell might have been saved to the country. It is always found that when columns of iron are cast solid throughout, the centre portion is much less dense and strong than the part nearer the outside, owing to the latter cooling more rapidly than the former; hence it has been found that hollow columns possess greater strength, weight for weight, than solid ones, and in inverse proportion to the thickness of the metal, which is always denser and has a higher specific gravity in thin castings than in thick ones.

Of the various kinds of timber employed for building purposes it may be generally affirmed that those which have a high specific gravity are stronger and more durable than others of a low specific gravity. Thus, if we compare pitch-pine with spruce, we find the former to have nearly twice the specific gravity of the latter, and that both in strength and durability it is also greatly superior. The wood at the centre or "heart" of firs and many other timber-trees has a higher specific gravity than that taken from the outer part of the trunk, being at the same time stronger and less liable to decay when used for building. Timber baulks are often unsound in the middle, and their strength is thereby greatly impaired; the unsoundness is difficult to discover without sawing them in two; but if their specific gravity was taken as they lay in the water or dock and compared with that of a sound piece of wood, the soundness, or otherwise, of the inside would be at once rendered certain, the unsound part having a lower density than the sound part; so that in case the timber was decayed in the middle the specific gravity of the whole beam would be less than that of a sound specimen.

There are many other building-materials to which the rule will apply; thus, if we compare different kinds of brick and roofing slates, we find that those which have the highest specific gravity are the most remarkable for their strength, durability, and non-absorption of water; the softer and lighter qualities being also more readily destroyed by exposure to weather. The strength of cement depends, in a remarkable degree, on its weight, Portland cement weighing only 106lb. per bushel being found to have little more than half the tensile strength of cement whose weight is 130lb. The adulteration of white-lead used by painters can be detected by its weight, as the materials mixed with it are generally of lower specific gravity. Many other examples might be adduced; but we think that enough has been said to prove that, in selecting materials for building purposes, a great deal more attention should be paid than is usually done to the question of their specific gravity.

ARCHITECTURAL ASSOCIATION.

THE fortnightly meeting of this association was held on Friday evening, the President, Mr. E. C. Lee, in the chair. Messrs. Edward W. Smith, F. Kenyon Parker, Arthur Smyth, and H. W. Simpson were elected as members. Mr. Eales, assistant-secretary, announced that the first visit of the session would take place on Saturday (to-morrow) the 29th inst., and would be made to the Standard Assurance Offices, King William-street, E.C.

THE "S.P.A.B." ON ITS DEFENCE.

The following letter was read by Mr. PAGE, hon. secretary:—

The Society for the Protection of Ancient Buildings,
9, Buckingham-street, Jan. 21st., 1881.

To the Hon. Secs. of the Architectural Association.

DEAR SIRS,—The attention of the Committee of this Society having been called to some remarks made by one of the speakers in the discussion that took place on the paper by Mr. Pink, of the 7th inst., I am desired to ask you to be good enough to read this letter at the next meeting of the Associati on. The Society has made efforts for the preservation of many of the churches of Norfolk, amongst others of North Walsham, and of St. Peter Mancroft, and St. George, Tombland, Norwich, besides having issued a pamphlet on "Restoration in East Anglia," a copy of which is enclosed. The Society is now occupied in endeavouring to procure the repair of Knapton Church. It recently drew the attention of the restoration committee at North Walsham to the nave roof of the church, and appealed to it to retain as much as possible of the remarkable and unique old roof, instead of wholly replacing it by a modern imitation. The Society has, from time to time for a lengthened period, directed its efforts against the work done at St. Alban's Abbey, and it opposed the granting of the faculty recently applied for for the restoration of the west front. In face, however, of the local approbation of the proposed restoration, its opposition was futile, and no further action seems now possible. The committee thinks that the same publicity should be given to this statement as to the remarks of the speaker referred to, which were, of course, made in ignorance of the proceedings of the Society. This will be gained if you will kindly read this letter to your meeting.—Yours faithfully (on behalf of the Society),

CHAS. G. VINALL, Hon. Sec.

PROPOSED VISIT TO ROME.

Mr. T. BLASHILL said he believed many architects and students, young and old, would like to hear of a good opportunity of visiting Rome, and he therefore mentioned that this spring an excursion would leave Paris a week before Easter, and return to Paris a week after Easter, stopping six days in Rome, two at Florence, and about one day each at Turin, Genoa, and Pisa. This would involve 17 days' absence from London, but of these 9 only were full working days. He went with two pupils last year, and now offered a few of the leading particulars about the excursion. The total outlay, travelling 2nd class, between Paris and Rome, and placing all arrangements in the latter city in the hands of recognised excursion agents, varied from £21 10s. to £25 15s., but a margin would be needed for extras, chiefly to be expended upon photographs. Low as these figures were, the arrangements were neither low nor insufficient, and a well-known sculptor and archæologist conducted the English section of the party in a manner quite equal to that with which our own archæological and architectural excursions had made us familiar. The advantages to be derived from such an excursion were very great, especially to anyone engaged in the study of Classical architecture. Six days in Rome, at the best a short time, was enough to enable a student to gain great insight into the examples of ancient art there displayed, and would give new value to all illustrations met with in future years. He suggested to any young men proposing to take part in the excursion to join together, and spend their evening leisure in reading Roman history, and in studying the large number of architectural works now available, and so to prepare themselves for sightseeing.

THE PROPOSED TRAVELLING STUDENTSHIP.

The PRESIDENT said he had a communication to make with reference to the proposal of an A.A. Travelling studentship, broached at the opening *conversazione*, which members would consider of a highly satisfactory character. Originally a very modest view of the situation was taken, and a sum of about £400 was aimed at; the prize sub-committee were entrusted with the duties of drawing up a draft of regulations which had since been submitted to the general committee, who had unanimously approved of it. One of the members of the sub-committee took a very sanguine view of the undertaking, and to him much of the success that had attended their preliminary proceedings was due. While some doubted whether the money could be raised, and recommended that a general appeal be made to the profession, and that the members be urged to canvass all their friends, he strongly supported the idea that the Association had power and energy enough to be self-ruling, and that the members could and would, if properly approached, raise a sufficient sum. He must here reveal that this sanguine member was no other than the hon. secretary of the sub-committe, Mr. Aston Webb. The report of the sub-committee would have been before the members this evening but for an unforeseen and very gratifying circumstance—namely, that although only about a hundred members and former members had subscribed, the sum originally proposed had been more than promised, and they would; therefore, not only be able to send out a student this year, but had determined, in order that the remaining seven-eighths of the members might have an opportunity of joining in the movement, to establish a second studentship. The actual sum provided was £515. Having made an urgent appeal to the general body of members to co-operate in the scheme, assuring them that the modest half-guineas would be equally valued with the larger sums that were given by the senior members, the President concluded by reading the draft conditions. The age of competitors will be limited in the present year to 25, in 1882 to 24, and in 1883 and afterwards the limit of age will be 23. Every candidate must be a member of the Architectural Association. The studentship will be of the value of not less than £20, and the tour of the successful candidate shall extend for at least four weeks. The drawings are to be submitted in competition by the first Friday in

May in each year, and consist of:—One drawing from the round (shaded); three sketches from existing buildings (or portions thereof); six sheets of measured drawings from buildings erected prior to the year 1750, drawn to a ½in. scale, with at least one sheet of full-sized details, on sheets of paper not exceeding imperial size. Should these conditions not be adhered to by the candidate, he will be disqualified. The student, prior to the commencement of his tour, shall receive the sum of £10, and should the judges be satisfied with the work executed by the student when on his tour, a further payment of £10 will be made, and a bronze medal presented to him at the annual *conversazione*.

PARSONAGES.

Mr. LACY W. RIDGE, diocesan architect for Sussex, read a paper upon this subject, premising that much of what he should say would be just as applicable to houses for gentlemen of small means as to parsonages. He proposed to speak of country parsonages standing in their own grounds; although much might be applicable to town parsonages, it was obvious that on confined sites, with a party-wall on either side, many features of the ideal building must be dispensed with. Parsonages differed from other houses not in essence, but in the accidents which surrounded them. These might be classified under two heads—tenure, and sources of funds for erection. As to the former point, it was necessary to remember that the parsonage and glebe belonged to the incumbent in right of his benefice, not as a trustee, but absolutely. Although the incumbent had power to build, enlarge, or otherwise improve the benefice at his own expense, or out of funds placed at his disposal, there were so many points on which the consent of the bishop and the patron were required that it was desirable, before beginning to build, to apprise them of the fact. On no point were they more likely to be anxious than that the buildings should be approximate to the benefice, and it was specially necessary, in view of possible future tenants, not to over-build the income derivable from the incumbency. Still, a good house, if in a pleasant district, attracted men of independent means, to the undoubted advantage of the parish. The greatest delinquents amongst the building clergy were those who added as much as possible to the outbuildings, regardless of quality of materials and soundness of construction, if they would outlast their own day. In building for a bachelor, or a man whose immediate requirements are small, or whose funds are limited, it was only right to remember that each new incumbent, or even the present one, might want to enlarge. If, therefore, space could be furnished in roofs which might hereafter be converted into attics, or could otherwise prepare for contingencies, it would be well. The funds available should be expended in making the house as commodious as possible, leaving it for future time to add bays, porches, and similar features. In some instances the lecturer had gone so far as to put in the girders for the openings into the future bays. At Eartham, for example [see illustration], the attic-roofs were laid, or, rather, the ceiling-joists of first-floor were strong enough to act as floor-joists. As an incumbent was landlord as well as tenant, he was liable for substantial repairs, no allowance being made for wear; and, if necessity arose, even for rebuilding. The workmanship should therefore be thoroughly sound and good, beauty should be achieved by good outline and proportion, and there must be an absence of ornamental features and architectural frivolities. The courts having held that internal papering and painting were merely decorative, the former might be omitted from the building-contract; but as to painting, he had never yet found anyone strong-minded enough to follow the decision to its logical conclusion, and leave internal work without its equivalent staining and varnishing. Aviaries, observatories, conservatories, &c., should not be included in works to be executed with funds supplied from a public source. Having referred to the speciality which affected parsonage-building, owing to the sources whence the funds were supplied, namely, the patron, public subscription, the Ecclesiastical Commissioners, the governors, Queen Anne's bounty, and lastly, the clergy who inhabit, Mr. Ridge remarked that he knew of but one complete Mediæval parsonage. This was at West Dean, situate in a hollow of the South Downs, near Eastbourne. It was now used as a cottage, and was a long two-story building, with two-light windows, having rebates for casements or shutters, a charming stack, and circular staircase. It was illustrated in Turner and Parker's "Domestic Gothic," and in the *Transactions* of the Sussex Archæological Society. In a large proportion of old Sussex livings was to be found, either standing alone or built into and incorporated with the house, a timber-built cottage with solid oak beams, a great central chimney stack, lead-light casements, brick-nogged or plastered panels, sometimes weather-tiled on the upper part, two-story in height at the front, and one end with a high-pitched roof running down to within a foot or two of the ground at the back and other end. The plan consisted simply of three or four rooms on each floor leading out from one another. The lowness of the stories and the insufficient height of the doors rendered it necessary for a modern man to take heed to his ways as he walked about therein. Such were the humble abodes of the mass of the country clergy 200 years ago. Since that time parsonages had passed through every form taken by other houses. It was at a more recent period discovered that the old timbers exceeded the necessary scantling in size, so fir was introduced of dimensions terribly attenuated. Slates were a great invention, and might be put at so much lower pitch than tiles, so on they went at an angle of 30° or less; but the south-west wind had since driven the rain right through. Then came the Gothic revival, when every room was gabled, and an accumulation of gutters and snow-stores created marvellous to behold, and terrible to keep clear and in repair, while to suffer patiently all the evils arising from casements and small lights might almost be regarded as the special form of martyrdom—not so severe, perhaps, but far more lasting than that now in vogue—by which the parsonage-building clergy of that day proved their orthodoxy. Common-sense, double-hung sashes, and, to some extent, Queen Anne (not in this case the Bountiful lady of Dean's-yard) had advanced the art some stages further, while the old weather-tiled timber house had asserted a considerable artistic influence in all parts of the country where brick and tile, rather than stone and slate, were the natural building materials. Never before were architects so free from the tyranny of style and prejudice, and so able to satisfy, in accordance with the dictates of common-sense, any definite requirements such as those issued by the Ecclesiastical Commissioners, to which he would proceed to call attention in detail. Even where architects did not need to obtain the Commissioners' consent to their drawings, they need hardly neglect the particulars issued by them, even if it were only to coerce a possibly self-willed client into the right way. He had Mr. Ewan Christian's authority for announcing that that gentleman, as architect to the Ecclesiastical Commissioners, was always ready to look over when in pencil, any drawings which were to be submitted to him. He would say to those who accepted this privilege—show the points of the compass on your plan, and look after your aspects; until you have satisfied Mr. Christian that you have obtained all the sunshine and cheerfulness that the site is capable of affording, you will have a bad time of it. The Commissioners, added Mr. Ridge, suggest the provision of two sitting-rooms with the somewhat modest dimensions of 16ft. by 14ft. It is certainly desirable that one room at least should exceed these dimensions, and I am inclined to give preference to the dining-room, as being that best adapted for those meetings of parishioners, and of neighbouring clergy, which constantly occur in parsonages. The dining-room is, as as in fact the commissioners call it, a "sitting-room"—in some cases the family sitting-room. It must be cheerful, with a south-east or southern aspect, and as unlike as possible to the state dining-room, looking north of a gentleman's mansion. The drawing-room, or ladies' room, has no special features in a parsonage. A bay will almost certainly be asked for, as some picturesqueness of plan is much appreciated. It is well to provide a side wall where a conservatory may be placed, and a French casement opening in that direction. The study is a room of considerable importance. It should be free from the disturbing influences of the household: for instance, its fireplace should not be back to back with that of the kitchen. It should be easily accessible for callers, though the kind of parish largely affects the mode in which this is to be provided for. In purely agricultural parishes, with the exception of the squire and a farmer or two, the people will go by preference to the back door. In more populous places the front door will be chiefly used, and a special study-entrance may be provided. As the study should be sacred to professional duty, a small room affords less temptation for domestic incursion; the 14ft. by 12ft. given by the Commissioners is ample. A kitchen and scullery must also be provided. To the five bedrooms, each with a fireplace, should be added at least one dressing-room, with a fireplace, if it may be, and large enough to hold a bed. Where only one dressing-room is provided, it is not a bad arrangement to make it applicable to either of two rooms, so that if guests come who expect that accommodation, it may be given over to them. You should bear definitely in mind which rooms you intend specially for the servants, and, in some cases, the adaptability of certain rooms for day and night nurseries will be discussed and provided for. The Commissioners also ask for pantry and china-closet, larder, water-closet, wine and beer-cellar, coal-house, dust-bin, &c. There should certainly be a pantry, rather than, or in addition to, a china-closet. Where cows are kept a dairy is necessary in the smallest house, and it must be near the back-door. Of water or earth-closets three are generally required—one on the first-floor, on first landing, one for gentlemen's use, either external or on the ground-floor, and one in connection with the servants' offices. As a rule, the two last I provide as earth-closets, wherever there is a garden. The provision of a cellar is much appreciated as an additional store, and also as a summer larder or dairy. Where there is no cellar, Mr. Christian suggests that the wine can be stored in bins under the stairs. Don't excavate a cellar in a damp soil, as a wet cellar is very dangerous to the health of a household. For the coal-place, cleaning-room, and servants' w.c., I have found it a good plan to provide a separate door out of the scullery, with a little covered lobby or yard. In one place, that of Forest-row [see illustration], I have abolished the old scullery back-door and have substituted a door calculated to be of very general use for tradesmen, servants, and parochial callers, as well as being a back-garden door. Where the front door opens into the garden and there are casements in the drawing-room, I hardly consider a special garden entrance necessary. It makes an additional external opening to bolt and bar, and is liable, unless very well managed, to be productive of through draughts, with the consequent slamming of doors. One thing not mentioned by the Ecclesiastical Commissioners, but almost essential, is a back staircase, or, at least, part of one. Where all the sitting-rooms are on the ground-floor, it is sufficient to provide a back staircase to the level of first landing only. An additional room very much valued is a parish-room. This does not mean a small public hall, such as that attached to the church of Whitechapel, or those which some London clergymen have provided; but a rough room, suitable for night schools, choir practices, and similar meetings to which the people will come in their working clothes, a place where mothers' meetings may be held, the parish lending-library kept, soup distributed, blankets served out, and the hundred and one other things done of which a rural parsonage is the centre. It serves for a waiting-room and for interviews with callers of the rougher classes. It should be easily accessible from the parish or back-door, rather than from the front door, and should have good means of ventilation. In the country store-closets are very necessary. A linen closet, near a flue if possible, or containing the tank of a hot-water system, is very desirable, and a clothes cupboard in the servants' bedroom is also useful. A bath-room, while nice, is not, in these days of the morning cold-water tub, a necessity, and the bath and the hot-water system should be provided at the incumbent's personal expense, and remain his property. Cold water should be laid on to first floor, and a housemaid's sink will be necessary. Unless the well is shallow and pumping easy, rain-water should be collected from the roof, and a supply for first-floor provided, the overflow being taken to a tank in the ground. Where you must depend on rain-water, the storage should be ample to cover dry seasons, and in such cases earth-closets have

manifest advantages. The water for kitchen boiler ought to be filtered. When you have a deep well and force-pump, its position is of the greatest importance, and should be fixed before setting out the house. Now as to construction. For warmth and dryness it is desirable to use hollow walls, properly bonded. My usual practice is to have 16in. hollow brick walls on ground-floor, and 9in. brickwork, covered with weather-tiling, on first floor. This has many advantages, beyond the appearance, over 16in. walls carried the whole height; you get a far better bearing for plates, especially those of first floor; there are no difficulties to contend with over the heads of windows; and there is no fear of sound being conducted up the hollow from one floor to the other. At the level of the under side of plate of ground-floor I put the damp-course on the inner face of wall only, carrying the hollow at least 3in. below it. It is best to have the 4in. thickness of brickwork on the outside and the 9in. inwards. At 9in. below first-floor plate build solid; the projection of weather-tiling will keep this dry. From plate-level have 9in. work, which, if the bricks are really square, may be built with bricks on edge in Flemish bond, giving 4½in. courses, into which the plain tiles can be nailed with long galvanised nails having heads. This work will certainly be dry. In suitable positions 11in. hollow walls are permitted. The Commissioners allow battening, but I have seen so much of it old and dilapidated, and of about the strength of a bandbox, that I have the strongest prejudice against it. For your peace of mind, put a damp-course to your chimneys at the junction of stack and roof, stepped up the rakes. Don't lay tiling in the London way; it will not be understood, and lead flashings or tiles dressed down as on slating are useless in the country. Access to roofs and gutters is desirable, not only for general purposes but because parsonages are subject to surveys at not unfrequent intervals. Do not, however, have more central gutters than you can fairly help; no one goes paddling about on a roof without doing harm. My practice is to cover the house with a single roof, broken up and disguised, it may be, with dormers, gables, and hips, starting from a high level on one side, and running down on the other, generally towards the north, to a few feet from the ground, so as to develop the principle of the old cottage parsonages. The requirements of the Governors of Queen Anne's Bounty correspond with those of the Ecclesiastical Commissioners. No paper on Parsonages would be complete that did not treat of the subject of alterations. The Bounty require in such cases an estimate of the value of old materials, which you will have to furnish. Speaking generally, bricks and stones will be reusable, old tiles, when old and sound, are better than new; a few doors may be available, but sashes and frames are seldom worth putting in again. Old oak is very disappointing; men object to work it on account of its extreme hardness and the nails in it. Look carefully for lead. For the rest, the old materials will hardly pay for taking down. It is well to remember that for a given outlay you can get a larger house, with more accommodation, by retaining as much as possible of the old place, than by the popular process with those who have not to find the money of clearing away and building *de novo*. An old house, intelligently altered, is more charming and picturesque than a brand-new one. You lay the plans of the old house down on paper, and then, without prejudice, arising from the uses to which the different parts are now put, con over how best you can bring the place into accord with modern ideas.

The PRESIDENT spoke in high terms of the practical character of the paper, and observed that for country parsonages a good arrangement was to provide a special entrance and lobby leading direct into the study with a bell rung from outside and hung in the room. He called upon

Mr. EWAN CHRISTIAN to open the discussion. He said Mr. Ridge had brought before them the general principles governing a parsonage-house, but there were a few points of detail which had been missed. The great distinction between a parsonage and any other gentleman's house was that, in the former case, you had to build not for the actual occupant, but for all future incumbents, and must provide things suited not for a man of means, but act upon the supposition that the occupant would have simply the income accruing from the benefice; further, the future tenant might be unmarried, or might have a large family, and it was impossible to conjecture how long the present occupant would remain there. In two cases, a parsonage and a palace, it had been his fortune to plan a house for one man, carry it out for a second, and a third inhabited it. In the case of the palace, the first bishop had a grown-up family, and wanted no special provision for their wants; his successor had a family of young children, and required two large nurseries to be provided. This was done, and then the third bishop came, and as his sons and daughters were grown up, he had the building altered back again at his own expense, while still paying off the cost of the previous alterations, from which he derived no benefit. A parsonage must, therefore, be planned and built upon general principles, and perhaps the easiest method of suggesting these would be to tell the members the mental process that he underwent when he looked over the plans of rural parsonages sent to him for examination. The first consideration was the aspect. In order to be healthy, a house must have all the sunlight possible. He had found so much difficulty in persuading architects and their clients to adopt these views that he had put up in his office an Italian proverb he learned from the late Professor Cockerell, "Where the sun does not come the physician does." The view might be good on the north, and the outlook might be on slums or a dead wall on south; but even then he believed the future occupants would prefer to live on the sunny side of the house. Three times in the course of his large practice had he given way to architects or their clients on this point of aspect, and in every case when he had visited the completed building, he had seen that it was a mistake, and that a little ingenuity on the part of the architect would have overcome the difficulty. The economies of the house were too often overlooked. It was the exception for a parson to have two servants, and needless time and labour in cleaning or serving must be avoided. He sometimes saw in a planned room of 16ft. by 14ft. as many as five separate windows—involving not only unnecessary original outlay, and the maintenance of curtains, glass, &c., but much time in cleaning, and extra bolts, bars, and shutters, to be moved twice every day. Long passages were also wasteful. All chimneys should be internal, so as to get the fireplaces in the most useful position, and utilise their heat; external chimneys were only permissible when made as thick and massive as old work of the kind. A house could not be healthy unless the staircase and corridors were warmed, and also provided with plenty of fresh air. Mr. Ridge had advised them to put the 9in. section of a hollow wall inside, and the 4½in. outside. Constructionally this was right, but there was a great practical difficulty; unless the bricks were extraordinarily good, the bond would not be thorough, and hence such a quality of brick would be required that it would be less expensive to build in solid 18in. work. At the same time the hollow space was an excellent non-conductor, and he therefore recommended them to put the 9in. course outside, or, where it could be afforded, to build with two 9in. thicknesses, with an interspace of 3in. In no case should the ties be of iron, which quickly rusted away. Built on either of these pl ns, and with a proper damp-course, a new house would be as dry and warm as most old ones. The drainage of the country parsonages was often a matter of very considerable difficulty, as no general sewerage system existed. Earth-closets were most useful, as they obviated the necessity for a cesspool. When the soil consisted of gravel over clay, the well-water supply would certainly be contaminated if a cesspit of any kind were dug, but if the soil were chalk or clay, over sand, all would be right. It was very important that nothing should be omitted from the plan, as if it were not discovered till the funds were borrowed it might not be completed for many years. He had seen a parsonage where for years there was no path or steps to front door, because this was overlooked in designing. No "fads" desired by a client should be given way to, for reasons he had already mentioned, but there was one which was especially objectionable—that of placing obscured or coloured glass in the upper part of the window, shutting out the best part of the light. He always denounced this abominable practice, and recently saw an instance of this, the design of a member of the Architectural Association, who had built a good many houses, which made him downright savage; he could have taken a hammer, and smashed that stained glass with the greatest pleasure. Again, he had known a country parsonage built with Bath-stone dressings, but in which there was not a single shelf, cupboard, or other fitting, the architect having forgotten or neglected Bacon's observation that men built houses to live in, not to look at. He constantly saw plans for timbered work of pitch-pine, barge-boards, &c., and disapproved of them, because a parson ought not to be burdened with painting every three years and repairing such unnecessary features. Old oak for reusing was worse than useless. It was not only, as Mr. Ridge had said, hard to work, but was almost always worm-eaten, and if laid where it could not be ventilated, would soon go, however sound it might be. He remembered discussing this with the late Sir Gilbert Scott, who replied, "But when you and I were young, 'old oak' was constantly specified." "No," he said, "that was 'old ship timber,' well seasoned by salt water and exposure, and quite a different material."

It being now 10 o'clock, Mr. BLASHILL proposed and Mr. H. W. PRATT seconded a vote of thanks to Mr. Ridge for his paper, and this was carried amid applause, and suitably acknowledged by the lecturer, who also thanked Mr. Christian for coming down that evening and giving them so practical an address.

THE CAPABILITIES OF RENAISSANCE.*

By ANDREW DEWAR.

IT is not, we think, generally remembered in the profession that every style of architecture has gone, and will continue to go, through four stages of existence; stages so little thought of, that we are convinced, were they more so, better work would be done and fewer crudities erected. The first stage, and what may pre-eminently be called the *life* of the style, is that during which it has come into existence, run its course of beauty, vigour, and grandeur, and died in the coldness and stiffness of a wearied old age. The second is the Renaissance, or new birth, when all the vigour of the old life is coursing through the veins of youthful enthusiastic giants, developing new forms and running riot in ornamentation, but whose hands are not yet softened to the delicacy of touch, nor minds trained to the cunning of the masters from whom they are learning. The third is the revival, where the young life of the Renaissance has lost its fire and foot-ruled itself to a correct but despicable copyism. And the last is the sepulchral or dead stage, when life, life-like studies, and even correct copyism are gone, and only gaunt skeletons grow into the air, freezing all art and feeling with their deadly stony stare.

The stage we have mainly to deal with to-night is the second, and while the subject is supposed to treat more particularly of the Renaissance of the Roman style, we think it will be to the purpose in this age of turmoil in architectural styles not to exclude from our consideration Renaissance as a whole.

It is scarcely necessary to tell an architectural association what Roman Renaissance is, and yet, if we may judge from the works of many who practise the style, it is a word without meaning. Renaissance, in most dictionaries, is said to be *revival*; this is apt to lead astray, for the correct meaning is new birth, and the term was applied in the first instance to the resuscitation of Classical learning in the fourteenth century, and thereafter to the new birth of the Roman style of architecture. This took place first in Italy, and gradually spread over all the civilised nations of Europe, each nation, as it copied the new-born architecture, impressing its own stamp upon it, so that now we have not only English Renaissance, but Italian, French, German, Spanish, and even Russian. Its influence has thus been boundless in Europe, showing that it contains the germs of a nobility which meets the aspirations of the most varied intellects of the civilised world. At the beginning of the Renaissance considerable fertility of design was displayed and picturesque combinations of Gothic forms and features in Classic dress showed how those early giants, such as Brunelleschi and Alberti, were feeling their

* Paper read, Jan. 19, before the Edinburgh Architectural Association.

way; and besides, it indicated as a finger-post of art the new road architecture was treading; but, unfortunately, when the climax of Italian Renaissance was reached in the erection of St. Peter's, the tide of mere copyism set in, and with a Palladio and a Vignola to mould the art by foot-rule and scale, architecture in Italy died, nor seems in any hurry for a resurrection.

When Roman art and the Empire died in arms, architecture was in infancy; every structure in its almost severe simplicity of form betokened the influence of Egyptian immortality and Grecian culture. While the bases and shafts of columns were broad enough to balance eternity, the capitals, friezes, and panels were worthy to be wrought in gold. Such a feature as a dome carried on pillars and hung in air was never planned, and spires were a flight above their grovelling religion. 'Tis true they built the Pantheon—and well deserved he immortality who conceived it, with its vast span and one almost poetic eye in its zenith, guiltless of glass, or frame, or bar, across which the white clouds flit in their depth of blue, while the rain and the sunshire poured in together; but Brunelleschi, when he lifted this down and balanced it upon his lofty pillars, so that Florence, far and near, should see the Pagan temple purified by Christianity, and swung into the heavens to show them where their thoughts and aspirations lay, accomplished a work than which there is not a more glorious in the whole story of art. Therein lay the true Renaissance, the true new birth of a style. Not the fashionably-clad skeleton of polished bones and grinning teeth, not the scarecrow of a thing that never had life, with a brand-new suit of a dead man's clothes, but the living body itself resurrected, with flesh and blood, with fire in the eye and strength in the muscle, and having on a garment that never grows old. Not the rigid standard of size, the equal balance of parts, the reduplication of form and idea, each moulding and projection labelled to the inviolable part of a module, so that the fear of inexactness freezes the heart of the most imaginative mind, but a form which changes with every purpose, a variety still consistent with harmony, projections as they are required for shadow or shade, and the ornament expressing all feeling and sentiment, showing nature in every variety of mood, and imbuing the undying front with such a picture of the times that like, an ever-open page of history, whoever runs may read.

Thus, we say, did the first Renaissance commence, and had it continued, would have been living still? But its history is the history of all styles, from Egyptian to Queen Anne; glory and decay are common to each. Art but resembles life in all its forms, and death comes sooner or later to both, so that the most we can do is to give longevity to that which is best, for the pantomime invariably comes in at the end of the circus.

In the Italian Renaissance we have said with St. Peter's commenced the decline of the style, for the idea of a dome was not new, and a vulgar struggle after mere size and bigness took the place of that search after new forms and new adaptations of an old style to changed requirements and altered conditions which had characterised the works of the preceding architects. With this lack of invention naturally commenced an increase of mere polishing. Kid gloves succeeded horny hands. Work was cleaner done, mouldings better shaped, ornament more regular, and planning more formal. Manner succeeded matter, ceremony succeeded sentiment, affectation supplanted feeling, and regularity superseded beauty.

It is interesting to trace this degeneracy from life into formalism in ornament, and no study will more richly repay the architect, or even mere lover of art, than a searching examination of the sculpture, carving, and ornament of the different periods of a style. As this is cognate to our subject, a sketch of it will not be amiss here. The idea was brought forcibly to our notice while sketching, more particularly the sculpture of the Gothic churches of England and Italy.

In the earliest carving we have, as a rule, very rough workmanship, but no mistake in the intention of the sculptor; his meaning, however rude his method, is brought out in startling relief. What a man said he meant in those days, and a spade was called a spade, under all circumstances. Thus, in St. Mark's, Venice, a sculptor wishes to tell you of John the Baptist, and he depicts him trying to fish his head out of a tub. Judas is hanging with a rope round his neck, and a purse in his hand. In the porch the whole story of the Creation and the Deluge is worked in mosaic; and Eve, in one, after eating the apple, is shown hurriedly putting on a garment, while Adam is looking most uncomfortable in a stiff nightshirt. In St. Zeno, Verona, two uncouth figures are being driven out of a garden, and as both are trying to hide their nakedness with a huge cabbage-leaf—not a dainty fig leaf, which only makes nudity more conspicuous*—no doubt is felt as to whom they are meant to represent.

Adam and Eve is indeed a favourite subject with all the old carvers. A peculiar one in Beverley Minster shows the pair beside the Tree of Knowledge; Eve has eaten the apple, and looks decidedly jolly, while she proffers a bite to Adam; but the worser half, finger in mouth, seems to doubt the propriety of the feast. A startlingly realistic group, on the centre door of Notre Dame, Paris, shows an angel holding the scales, in which a praying saint and a sinner are being weighed. The saint overbalances the scale, and thus the sinner is found wanting, although the Devil himself, with hands on beam and scale, is striving to bear it down. A smaller devil also reaches from the burning brimstone, with a crooked bar, and bends his energies to the hopeless task, but all in vain. Here, a lesson taught to all mankind, the carver's rude chisel-marks being, without doubt, of more meaning to the godless of Paris, than the sermons of five centuries of preachers.

As evidencing in a peculiar manner the ubiquity of the Gothic style, and the ties which in those distant ages linked together countries so far apart, we may mention a group met with no less than five times in four different nationalities—The Creation of Eve. The first place we observed it was at Roslin Chapel. On an old oak chest in the crypt may be seen a most graphic and realistic bas-relief of this most interesting episode of our history. Adam is asleep and lying on his side, head on hand. The Deity, in pontifical robes and tiara, is kneeling down, and lifting Eve bodily out of Adam's side, while the effulgent sun and crescent moon, each fashioned into a face, smile complacently on the portentous event. At Beverley we were amazed to find the same group slightly altered, the Deity standing, with monk's robes but no tiara, and Eve floating gracefully into the air, all but her feet out. Travelling southwards, we next encountered the same scene at Sainte Chapelle, Paris, rendered lifeless, however, by a modern restorer, and the sculptor, whether first or second was not very clear, had perpetrated the anachronism of providing Adam with a fig-leaf! We next saw it at Orvieto, and last at St. Zeno, Verona, which probably is the original of all the others, as the church dates from the 12th century.

Numerous other instances might be multiplied of the life and history conveyed by those early Gothic carvings; but our point at present is to show that as the sculptures grew more perfect, the stories told became fewer, the attitudes more formal, and the meaning more vague. From bas-reliefs on plain panels the figures grew more and more relieved, until they stood first in niches and then on the apexes of gables and pinnacles, when they were lost in the clouds.

In the revival of Gothic in our own times, we would expect an evidence of the progress of the world's culture in the carving exhibited; but what see we? Where sculpture is attempted, a king and queen's head terminates the label of an entrance porch. Why they have been so decapitated; whether emblematical of a monarchy or a republic; whether there as Defenders of the Faith, or gibbeted for their misdeeds, nobody knows, and nobody ever pretends to know; nor is our disgust allayed when we are aware the same thing is repeated tens of thousands of times over the length and breadth of the land. But we have made greater progress than this, to do ourselves justice. We have, in Edinburgh, a brand-new cathedral, by one of the greatest architects of the 19th century, and on this, if anywhere, should examples of our progress in carving in 600 years be found. Contrast, therefore, with the sermon on Notre Dame the west doorway of St. Mary's. Over the entrance a central sitting figure holds a key in one hand, and a lamb in the other—nothing wonderfully original in either idea, or conveying any decided meaning. John the Baptist is on one side—why not Peter?—he got the key; and a man prays on the other—but what for? The whole combination has only been half thought out; but the paucity of imagination is most strikingly displayed when we examine the rest of the doorway, decorated merely with copies from York, Beverley, and Ely, of all sorts of monsters growing out of, and intertwined with foliage. These monsters have no meaning in this enlightened age. The days of ghosts and ogres are gone. Once upon a time this *delirium tremens* of religion was a terrible reality; but when Sir Gilbert Scott expected to frighten the fashionable west-end inhabitants of Edinburgh with such bogies, he certainly was not flattering the intelligence of our learned metropolis; still such may be, notwithstanding, a correct Cockney notion of Scottish culture. While not profuse in the exterior decoration of St. Mary's, enough has been lavished on a useless zigzag enrichment on the interior clerestory windows to have carved the whole of the "Sermon on the Mount."

(To be continued.)

* A ridiculous example of this is seen in the Vatican, where some squeamish Pope had contracted for bushels of stucco figleaves, and had them plastered over every nude figure indiscriminately—man, woman and child.

COMPETITIONS.

FOREST HILL.—We hear there are five sets of designs submitted for the proposed new church of St. Paul's, Forest-hill, and that a committee-meeting was held last Wednesday evening to take them into consideration and to make a selection. We are glad it is proposed to obtain the opinion of a professional architect of eminence upon them. An excellent site upon rising ground in the rear of the present temporary church has been selected, and the sum fixed upon by the Committee is £6,000 without a spire, though a few of the designs would exceed this sum.

PONTEFRACT TOWN-HALL SCHEME.—The town-hall committee of the corporation, under the presidency of the Mayor, met on Monday evening for the purpose of opening the seals of the authors of the numerous designs for the additions to the above. The author of the selected plans, "Straight and True," is Mr. Perkins, of Leeds, and he will be intrusted to carry out the work. The second selected design, "1880," is the work of Messrs. Roper and Brown, of Manchester.

CHIPS.

At the Carlisle Consistory Court, held on Wednesday week, plans were produced, and a faculty granted for the addition of a south aisle, 60ft. by 20ft., north porch, and heating chamber, and the rebuilding of the vestry at St. John's Church, Keswick. Mr. Watson, of Penrith, is the architect, and the cost is estimated at £1,300.

The Guildford town-council last week discussed the question of sewering the town, and eventually referred the matter to a special committee. It was stated that Mr. R. Rawlinson, C.B., had expressed an opinion that the town could be well sewered for £12,000.

A three-light window at the west end of south aisle of Halifax parish-church is being fitted with stained glass as a memorial to the late Archdeacon Musgrave, 48 years vicar of the parish. Messrs. Hardman, of Birmingham and London, are carrying out the work.

A new Congregational church has just been commenced at Chiswick. Mr. Brunsden is the contractor.

Mr. Henry Bruce Joy has just completed a statue of the late Lord Chief Justice (of Ireland) Whiteside, which is to be placed in St. Patrick's Cathedral, Dublin. It is executed in marble, and represents the chief justice in a sitting attitude arrayed in his full robes.

The apse of Albury parish-church, Surrey, has just been fitted with sumptuous hangings of velvet and silk, having a gold ground with pomegranate figuring and narrower bands of claret, green, and gold. The hangings were made and presented by Lady Rokewood Gage.

At the meeting of the Wimbledon Local Board held last week, one of the members moved that as the opinion of the board was at variance with that of the surveyor, Mr. Mason, on the drainage and other matters, he be given the usual three months' notice. This having been seconded, an acrimonious personal discussion took place, in the course of which it transpired that the clerk to the board had written a private letter to Mr. Mason, urging him to resign. The subject was eventually referred to a committee of the whole board.

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ILLUSTRATIONS.

ROYAL ACADEMY PRIZE MEDAL DRAWING OF ENTRANCE TO CHAPTER-HOUSE, WESTMINSTER.—SUSSEX PARSONAGES.—GOTHIC CHAMBER IN THE LIMES, DULWICH.

OUR LITHOGRAPHIC ILLUSTRATIONS.

WESTMINSTER ABBEY.—THE ENTRANCE TO THE CHAPTER-HOUSE.

FOR the detail drawings from Westminster Abbey, which we have reproduced to-day, Mr. M. Allen received the Royal Academy "First Silver Medal for Measured Drawings" for 1880. The double-page plate furnishes a front elevation as well as a section of the entrance to the Chapter House, and the single-page sheet includes the elevation as seen from the passage-lobby, and also a longitudinal section (looking south) of the passage between the Chapter-house and the cloister. All the stone joints are put in from actual measurement, and the sizes in figures are also furnished on the plates. The subject thus illustrated is so well known as to need little description on the present occasion. A review of all the drawings submitted in competition for the R.A. medals and prizes was published in the BUILDING NEWS for Dec. 17 last year.

SUSSEX PARSONAGES.

OUR first double-page plate to-day includes the plans and exterior views of four Sussex parsonages, which have lately been erected, from the designs, and under the supervision, of Mr. Lacy W. Ridge, F.R.I.B.A., and who is also diocesan surveyor to Chichester. We have chosen these drawings in order to practically illustrate Mr. Ridge's lecture on "Country Parsonages," which was delivered last Friday before the Architectural Association, and reported by us to-day on page 92. The buildings illustrated are Eartham Vicarage, East Wittering Rectory, Bishopstone Vicarage, and Forest-row Vicarage. The plans in each case are all carefully figured, and little, therefore, need be said by way of detailed description beyond a reference here to the report which we give of the lecture.

GOTHIC CHAMBER AT THE "LIMES," DULWICH.

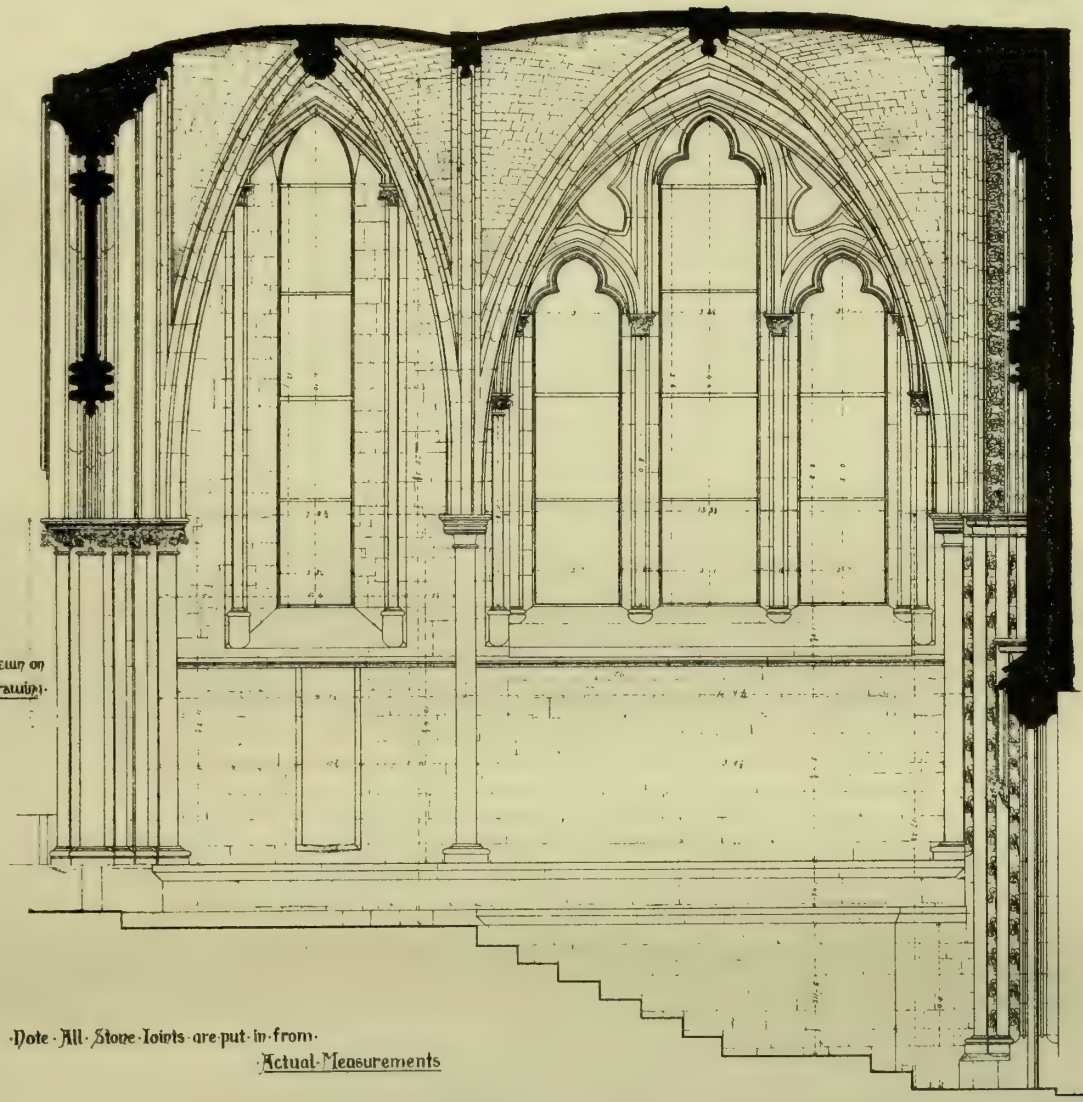
ONE of the most picturesque interior drawings of domestic decoration this year at the Royal Academy was that which we publish to-day, showing the "Gothic Chamber," as it is called, lately completed at "The Limes," Dulwich, from the designs of Mr. Theodore A. Howard, architect, of Berners-street, W. An interesting feature in the design is the "upper chamber," or retreat, over the fireplace, and which is reached by a quaintly-contrived lobby and staircase. The style chosen for the entire work and furnishings, and hence the name of the apartment, is Gothic. As an example of this style, the illustration cannot fail to be interesting at the present time, when other styles are generally thought more suitable.

A block of county police buildings has just been erected in Church-street, Oldbury. The front elevation is of red bricks with Bath-stone dressings. Mr. Henry Rowe, county surveyor for Worcestershire, was the architect, and Mr. G. H. Marshall, of West Smethwick, the contractor.

HOUSE-DRAINAGE, SEWERAGE, AND VENTILATION.

A PAPER upon these subjects was read before the Society of Civil and Mechanical Engineers by Mr. Reginald Middleton, on Thursday night. The author pointed out that in house-drainage sewage matter should be removed as soon as possible and entirely, so that there may be no fermentation, and that when it has left the house there should be no return of the gases evolved from it. To effect this it is necessary that all pipes should be air and watertight; that the drains should be laid, if possible, outside the houses and in straight lines both as regards direction and gradient; that they should be free from the walls, so that settlement of the foundations may not affect them, and that they should be easily accessible. No connection should be made with the drain inside the walls of the house, and a disconnecting and ventilating chamber, protected by a siphon trap, should be introduced between the drain and the street-sewer. The closets should be placed outside the main walls of the house, and should be ventilated, the soil-pipe should be outside the house altogether, and should be carried of its full diameter to a point above the roof and not near either windows or chimneys. The pan closet and ⊃ trap should be done away with, and an apparatus used free from angles and without space for the evolution of gas. The waste-pipes from cisterns, and safes of baths and closets, should be carried into the open air and no further, so that they may act as detectors. The discharge-pipes from sinks, baths, and lavatories should be entirely disconnected from the main drain or soil-pipe, and should deliver in the open air on to the gratings of stoneware siphon gullies, which, again, should discharge into a manhole on the main drain. No trap of any sort in direct connection with the main drain should be placed inside the house. The drain should be ventilated from the siphon rear, the sewer to its extremity. Many cowls and other mechanical contrivances have been devised for increasing ventilation; but, in the opinion of the author, they either fail when most wanted or are unnecessary. Cisterns should not be made of lead, but preferably of galvanised iron; they should be carefully covered in and easily accessible, and frequently cleansed. There should be separate cisterns provided for flushing closets, and it should be impossible to draw any water from these except for that purpose. No cisterns used for dietetic purposes, or for anything but the flushing of the closets, should have any connection whatever with any drain, trap, or soil-pipe. The main drain must be laid to such a gradient that it will be self-cleansing. When such a drain goes under a house, which cannot always be avoided, the best material to be used is cast iron jointed with tarred spunyarn, and leaded, and laid in a bed of Portland cement concrete. A diameter of 4in. is amply sufficient for the drain of an ordinary house. A hope was expressed that before long wrought iron will supersede lead for pressure pipes. House-inspection seemed to be little understood by householders. A mechanic is well fitted to examine into the condition of the pipes and appliances, but of the designing of sanitary arrangements he knows nothing, or less than nothing, for what he does know is faulty. It is almost useless to call in an engineer to examine a house unless he sees the whole of it, and it is equally useless to ask him to certify as to the condition of the house, if the work has been carried out by the local builder from his report, unless he has seen the whole of the reconstruction. He did not think that compulsory inspection by officers appointed by the local authorities will satisfactorily meet the requirements of householders and the public. When the sewage has passed the siphon trap on the main drain the house should have done with it; but such is not generally the case. If the main drain is disconnected from the sewer by a ventilating manhole, any gas which may return will be carried up the ventilating pipe, but as drains are generally arranged it passes into the house. Small pipes and drains should have a gradient producing a minimum velocity in them of 180ft. per minute, and large sewers should have a minimum of 150ft. If these velocities are not maintained deposit will take place, and the sewer will become an elongated cesspool. The quantity of sewage to be discharged is constantly varying, but for practical purposes it may be taken that one half passes away in eight hours. To meet this variation oval sewers have been designed in which the scouring action is more concentrated than in the circular sewer. In a sewer in which the transverse diameter is $\frac{2}{3}$ of the vertical diameter, the radius of the invert is $\frac{1}{3}$, and the radii of the sides $1\frac{1}{3}$ the transverse diameter, measuring 3ft. 9in. by 2ft. 6in. with a gradient of 1 in 900, will discharge 1,000 cubic feet per minute with a mean velocity of flow of 167ft. per minute, and half that quantity with a velocity of 151ft. per minute. This provides for the discharge of the sewage proper of a town of 200,000 inhabitants. If, however, the rainfall on an area of 4 square miles at the rate of 1in. in 24 hours, 80 per cent. of which finds its way into the sewers, be added, the dimensions will have to be increased to 7ft. 6in. by 5ft., and the velocity will be, with the same gradient and running full, 241ft. per minute, while, when discharging 500 cubic feet, the velocity will be 151ft. per minute. Drains must be provided for the removal of rainwater, but these may be taken to the nearest stream, and may be short and small, whereas if the sewer is used for this purpose it necessarily goes on increasing in size up to its outfall. Where pumping has to be resorted to, the introduction of rainwater into sewers is especially to be avoided. However desirable it may be that the separate system should be adopted, there are difficulties in the way. Two drains have to be provided, and workmen are so careless and ignorant that, unless special precautions are taken to prevent it, they will join up the house drains to either conduit indiscriminately; this arrangement would also add to the complication of our underground works. As the maximum velocity in drains should be about 270ft. per minute, these cannot be laid down steep hills, but should be contoured round them. In low-lying ground it is difficult to maintain a velocity of 150ft. per minute, and here, in many cases, flushing or pumping must be resorted to. If lift pumps are used, the expense of plant, buildings, and ground is serious, besides the constant yearly charge for fuel, repairs, and attendance. The greatest care must be taken that the foundations of sewers are sound, and that the material employed is well adapted to resist the acids contained in the sewage and the erosive action of water. Portland cement concrete pipes make good sewers for the smaller sizes, and similar concrete laid *in situ* would be better than brick for the larger sewers. House junctions should be laid in when the sewer is built, even if not at once used, and they should point in the direction of the flow. All angles or causes of retardation should be avoided, as also any splashing, which will cause deposit. All sewers should be laid in straight lines, both as regards direction and gradient, so that their position may be known without difficulty, and they may be easily inspected and cleansed. Sewering through the streets is to be preferred to draining along the backs of houses. A very useful arrangement, where the fall of the drains is small, and where it is desired to irrigate on a small scale, is the flush tank, which, when full, discharges its contents automatically by means of a siphon. The author considered the arrangement designed by Mr. Isaac Shone, of Wrexham, superior to that of Mr. Rogers Field, both in its certainty of action, and in its cheapness. Both these arrangements were good protectors against the return of sewer-gas. The best mode of disposal was to put sewage on the land, and the ordinary sewage farming seemed to be the most natural and simple method. Intermittent filtration is only the same thing in a condensed form. Sewage farms do pay, he stated, when not carried out on too grand a scale, and where not charged with amounts which in no way belong to them. The sludge is troublesome, but it may be collected in tanks, dried and mixed with bone-dust or otherwise, and used as a separate manure, or it may, in some cases, be ploughed into the ground. For the success of sewage farms the separate system is almost necessary. In conclusion, the lecturer dealt with the question of ventilation, expressing his belief that cold air may be introduced into a room without draughts supervening if the aggregate of the openings be large enough, while each individual opening is very small, and if the supply of fresh air for the lights and also for the fire be introduced to them direct.

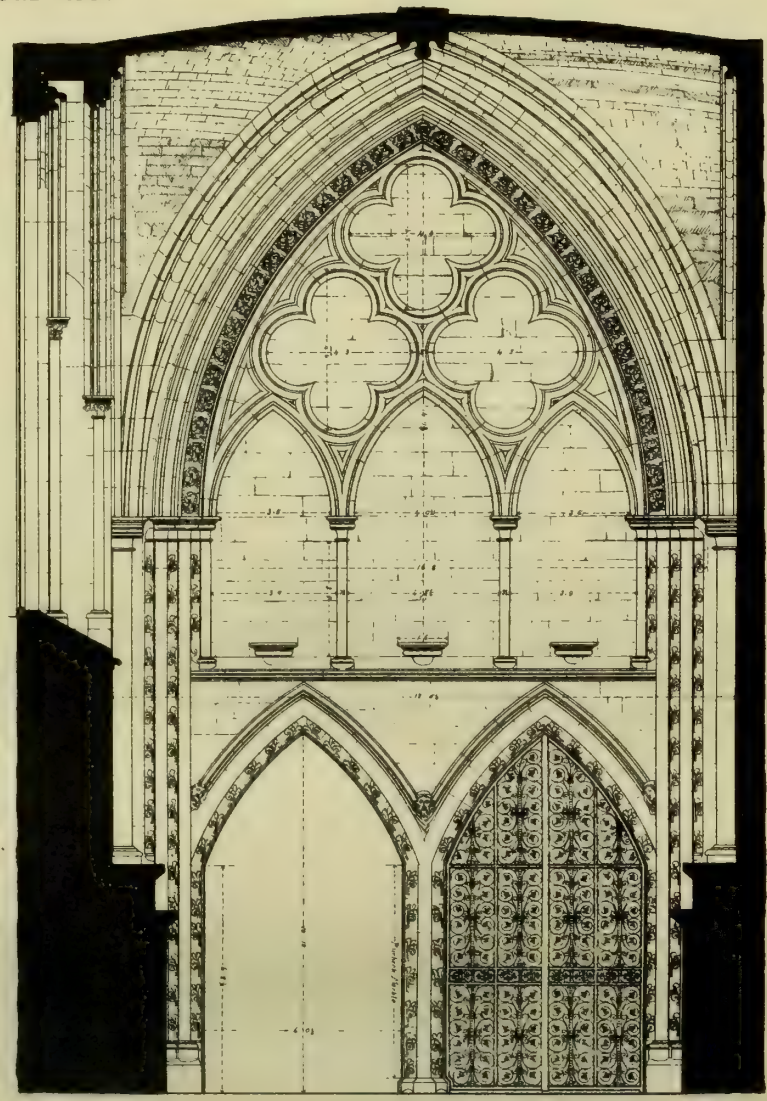
ROYAL ACADEMY PRIZE MEDAL AWARDED 1880



Griched as shewn on Inch Scale Drawing.

Note · All · Stone · Joints · are put in from · Actual · Measurements

— Longitudinal · Section · looking · South —



— Transverse · Section · looking · West —

M · Allen ·

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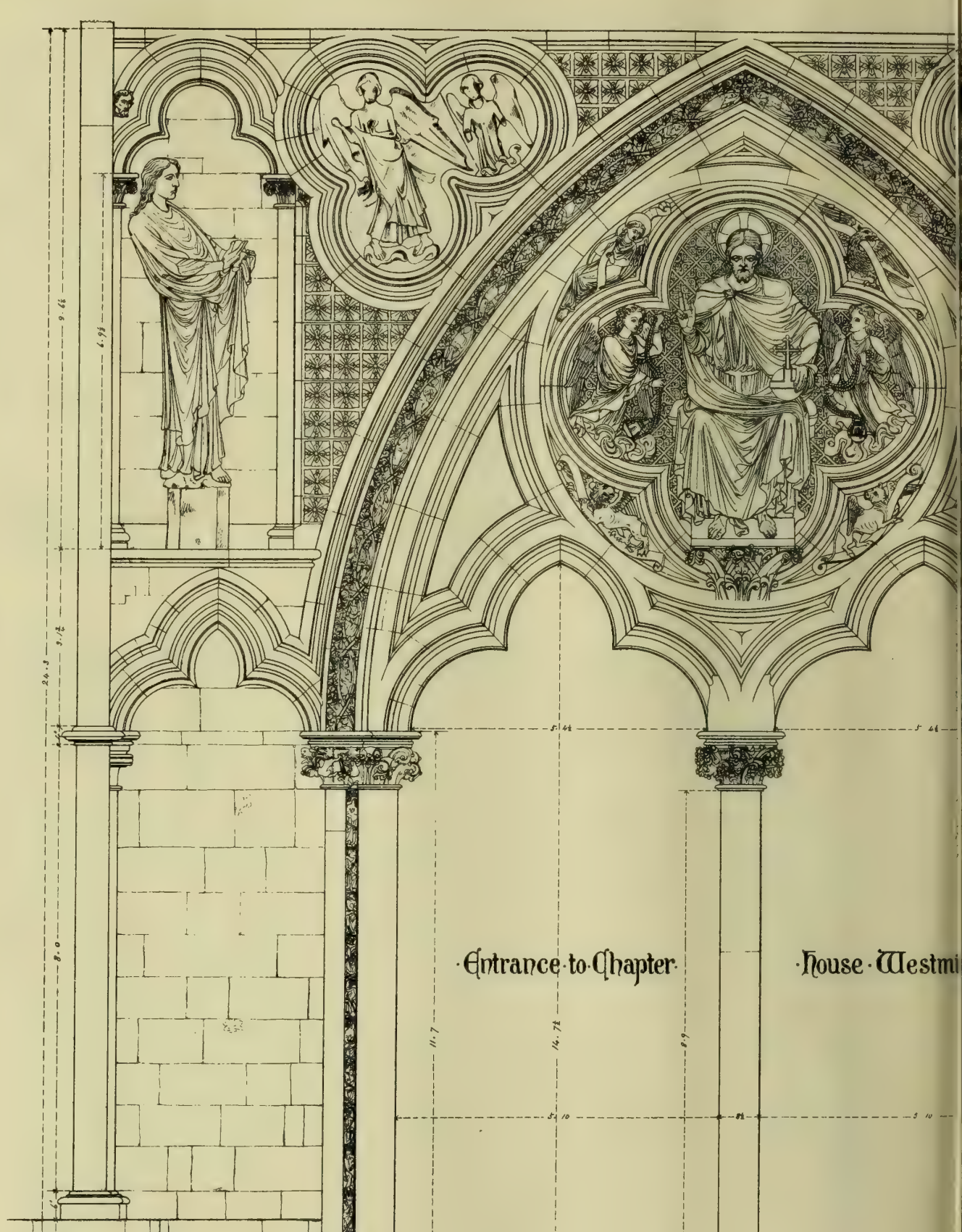
— Inner Passage between Cloister and Chapter House Westminster —



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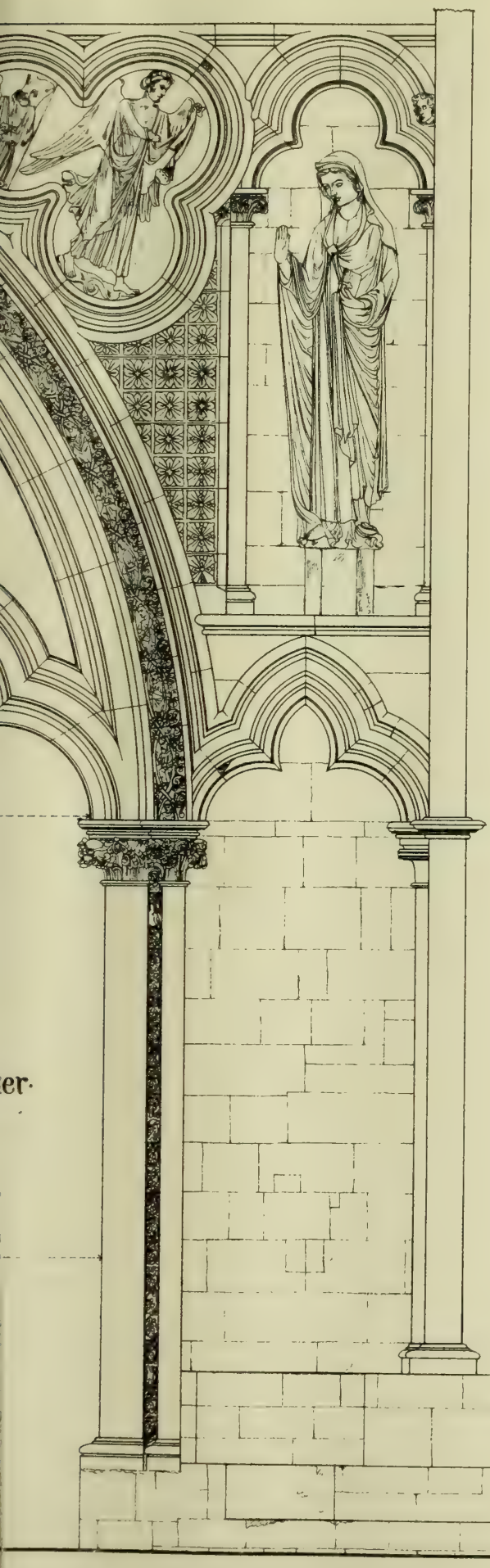
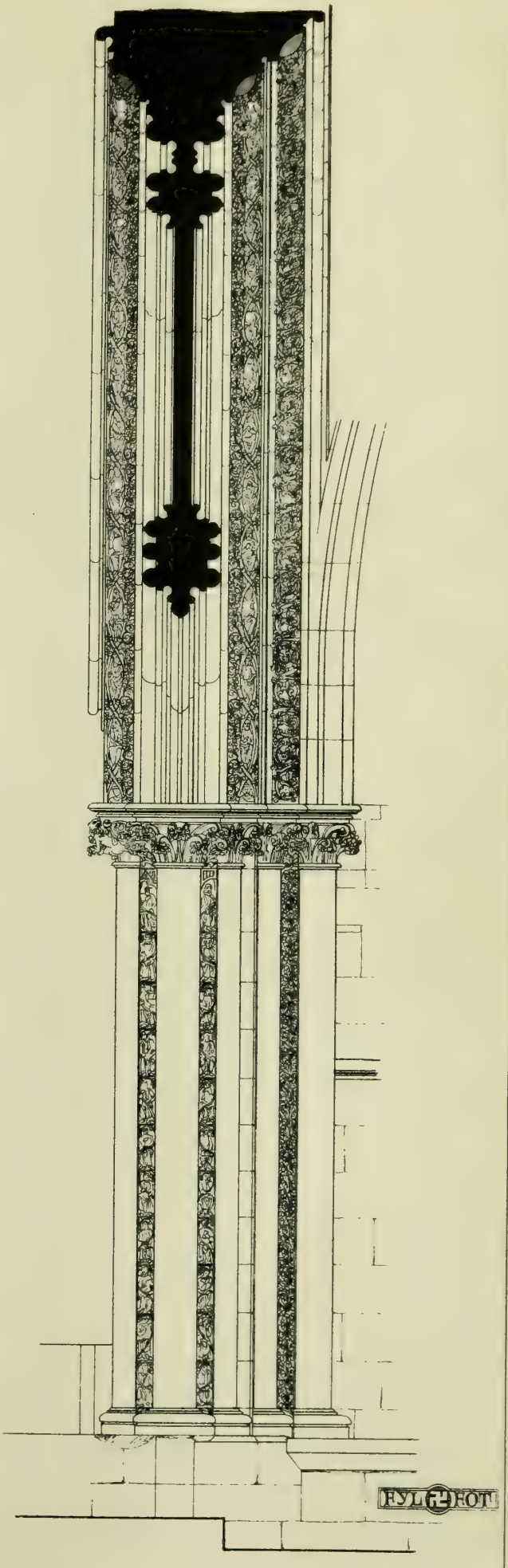
ROYAL ACADEMY PRIZE MEDAL





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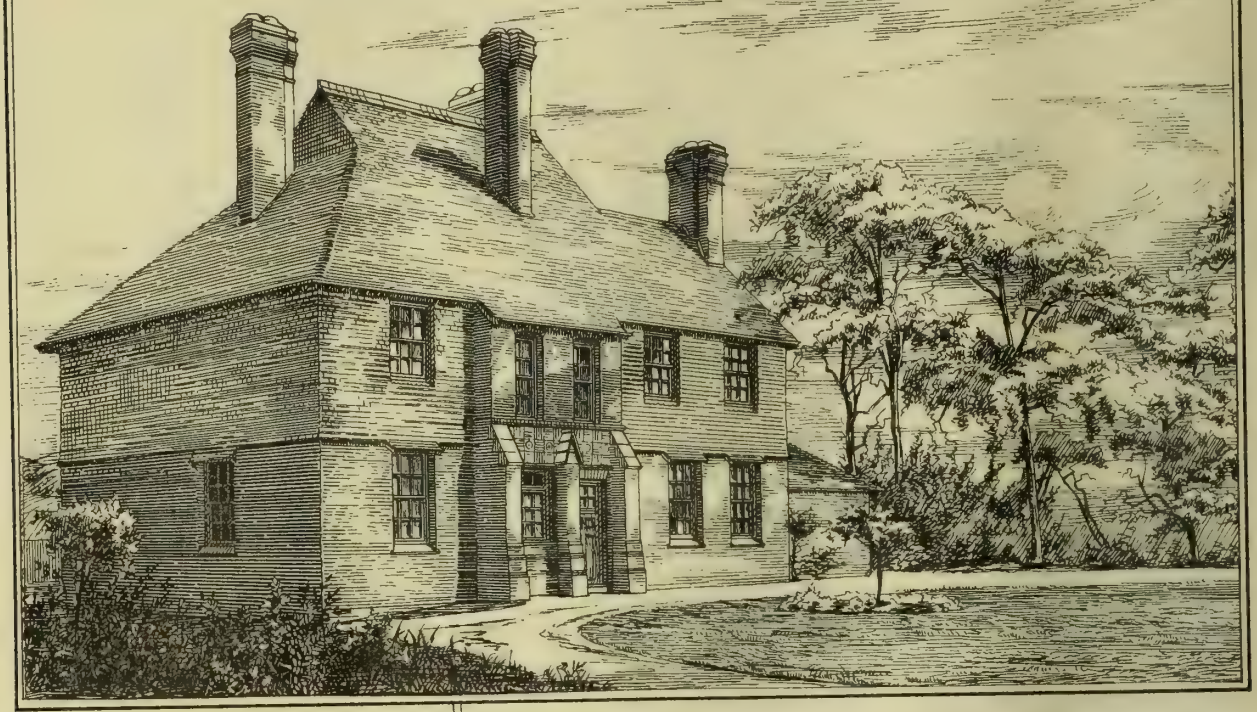
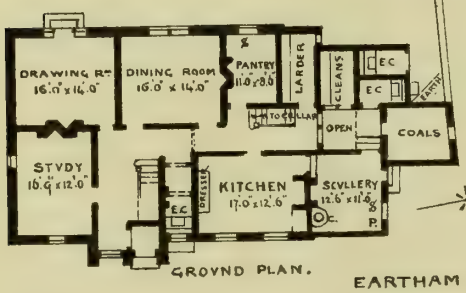
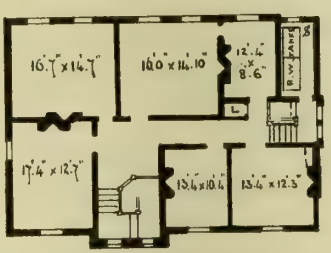
SUSSEX PARSONAGES.

EARTHAM VICARAGE.





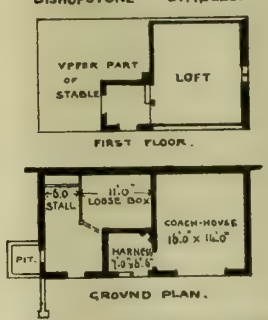
GROUND PLAN.



FIRST FLOOR PLAN.

EARTHAM VICARAGE.

BISHOPSTONE STABLES.

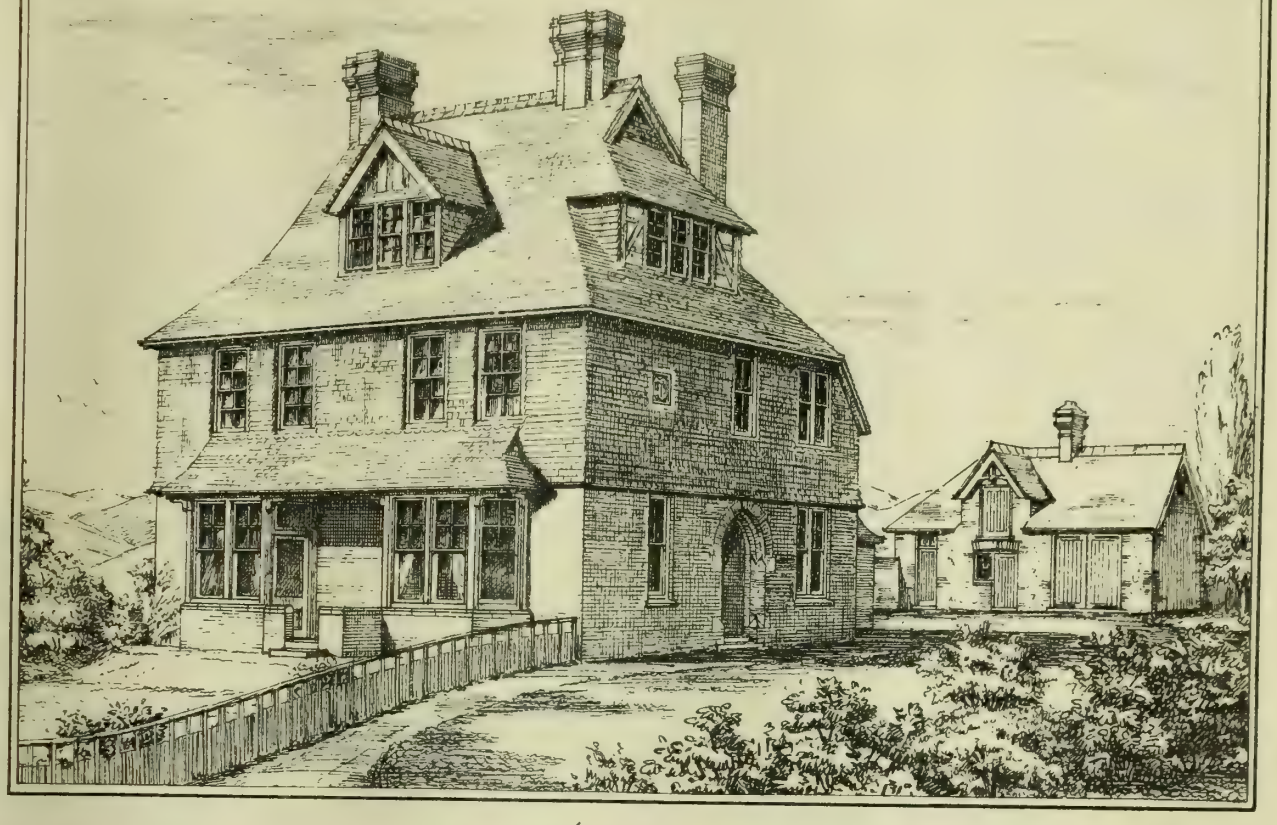


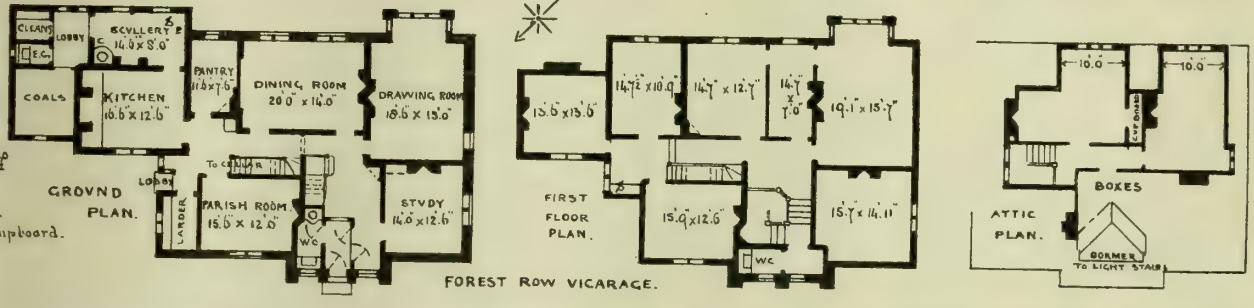
GROUND PLAN.

EAST WITTERING RECTORY.

BISHOPSTONE VICARAGE.

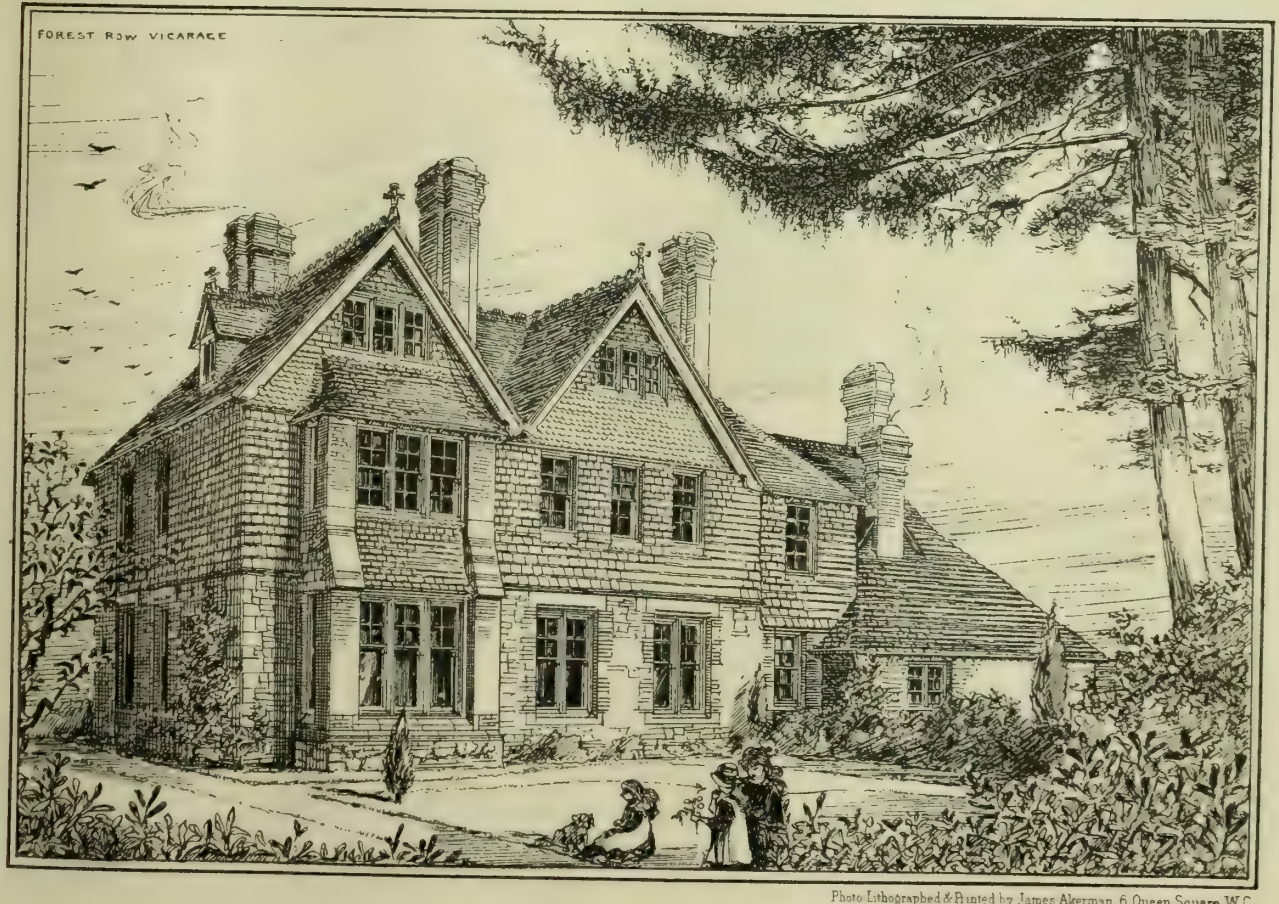
LACY W. RIDGE F.R.I.B.A DIOCESAN SURVEYOR. Architect.





S. Sink
P. pump
C. copper
L. linen cupboard.

FOREST ROW VICARAGE.



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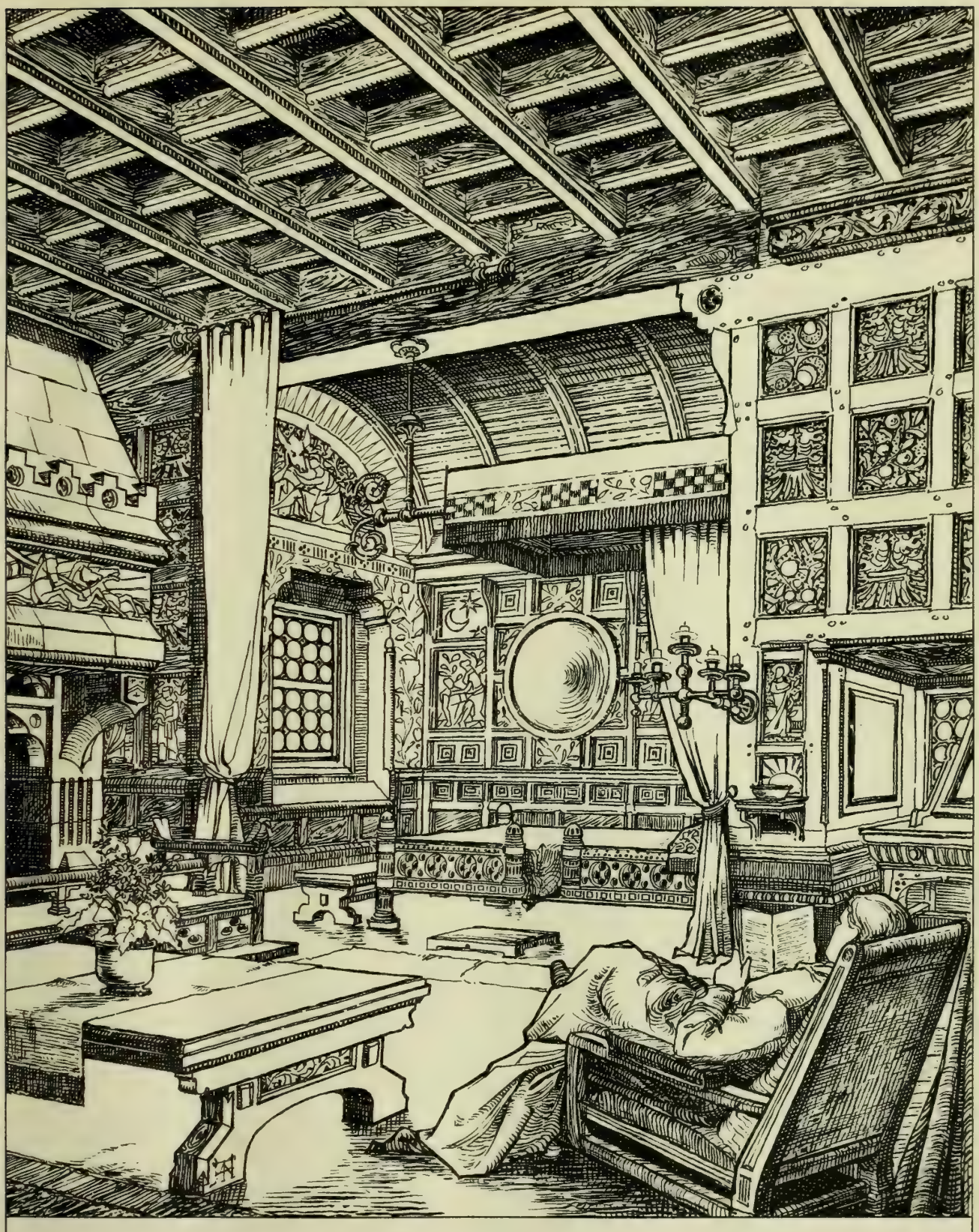
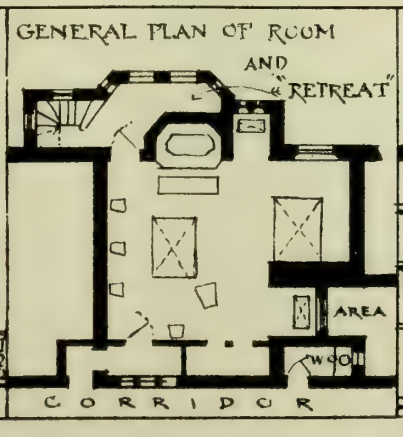
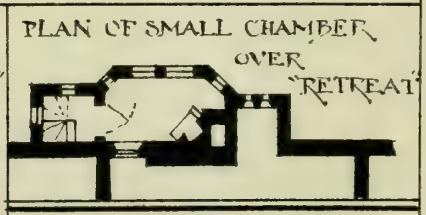


LOOKING TOWARDS FIREPLACE, &C.





CHAMBER IN
"THE LIMES" DULWICH

THEODORE A. HOWARD, ARCHITECT
60 BERNERS ST. W.

Photo Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

PROFESSOR NEWTON ON GREEK ART.

PROFESSOR NEWTON commenced a course of lectures on the "Greek Art of the Age of Pericles" on the 7th inst., at University College. He said he had that day to talk about three artists who immediately preceded Phidias, not literally with reference to date, but in style. The first was Pythagoras, who was not uncommonly called Pythagoras of Rhegium, his date falling some time between 500 and 460 B.C., as was proved by the dates of certain statues of Olympic victors which were made by him, and of which Pausanias gave the names. There was an interesting, though, unfortunately, too brief, notice of Pythagoras of Rhegium in Pliny, who said that he was the first to render more like nature, the veins and the muscles, also the hair, of the human form, as represented in his statues. He took more pains, and got out of the previously conventional way of representing those details. In short, he put more life into his figures. He and the other two artists of whom the lecturer intended speaking on that occasion were workers in bronze. He believed there was no evidence that they ever worked in marble. Pythagoras made several statues of athletes, and also a figure of a lame man limping owing to an ulcer in his foot, and in which, according to the testimony of the ancients, the agony of the limping man was admirably expressed in the face of the statue. There was other testimony in ancient writings, to the effect that Pythagoras was the first to impart to his statues the qualities of rhythm and symmetry. Unfortunately, we had no extant samples of his art that we could appeal to with certainty as to their identity.

After a lengthy criticism of the opinions recently advanced in the "Journal of Hellenic Studies," by Dr. Waldstein on the art of Pythagoras, and especially with reference to a statue said to be by him, now in the British Museum, Professor Newton passed on to notice the second of the three sculptors to whom the lecture had reference—Myron, who, like Polycletus and Phidias, was a pupil of Ageladas of Argos. He was a Bœotian, and was said to have competed for a statue with Pythagoras, and to have been beaten by him. His date must, therefore, be put at least as far back as 460 B.C. He was probably a little earlier than Phidias, and, as far as we knew, worked exclusively in bronze, and there was no doubt that he was, in the eyes of the ancients, one of the great early masters in that material. We had a considerable list of his works—twelve or thirteen—and among them were two or three which attracted the special notice of the ancients, not merely of the Roman critics, but of the poets; indeed, it might be said that Myron was the first of the great sculptors of antiquity whose fame had come down to us, not merely in the casual notices of Greek or Roman critics but in the writings of the poets. The third and last sculptor with whom he had to deal in the lecture was Polycletus, who, as already stated, was like Myron, a pupil of Ageladas. According to Overbeck, he was some fourteen or fifteen years older than Phidias, but the notices of him rather indicated that he retained certain archaicisms. His most celebrated work was the chryselephantine statue of the goddess Hera, at Argos, of which we had some faint idea from a bronze coin of the Roman period. This statue was described by Pausanias, and seemed to have ranked next in importance to the two more celebrated chryselephantine statues, viz., that of Athené, at Athens, and that of Zeus, at Olympia. Quintilian, while praising Polycletus very strongly, said that his statues of the gods, beautiful as they were, were deficient in majesty. Of his statues at Athens, the most celebrated were the Diadumenos, an athlete putting on a diadem, and the Doryphoros, an athlete with a spear.

Professor Newton's second lecture was delivered last Friday. It dealt with the public works at Athens dating from that period, but in order fully to appreciate the character of those it was necessary, he said, to give a retrospective sketch of Athenian history from the date of the taking of Athens by the Persians, B.C. 480, when the temples on the Acropolis were burnt. The half-century between this date and the breaking out of the Peloponnesian war, B.C. 431, might be conveniently divided into three periods corresponding with the successive administrations of the three great Athenian statesmen, Themistocles, Cimon, and Pericles. Themistocles, the victor of Salamis, had for his first object the fortifying Athens after the retreat of the Persians. In spite of the jealous opposition of Sparta, he succeeded in building a wall seven miles long round Athens itself. His next work was to fortify the Piræus and Munychia with a wall 14ft. or 15ft. thick, built throughout of solid blocks of stone. This gave complete security to the shipping in the harbour of the Piræus. The further plans of Themistocles, which probably included the connecting Athens with the Piræus by the long walls, were cut short by his banishment, B.C. 466, when Cimon rose to power. The southern wall of the Acropolis was built by him, and the great bronze statue of Athene Promachos, on the Parthenon, may have been dedicated during his administration. The great painter Polygnotos was his personal friend, and painted the Stoa Poikile, and the Theseium. One of the first acts of Pericles on coming into power after the banishment of Cimon was the building of the long walls which connected Athens with the Piræus, converting the port and the city into one great fortress. The building of these walls was commenced B.C. 458, and completed B.C. 451. Round the harbour of the Piræus was built a new city on a regular plan, designed by the celebrated architect Hippodamos of Miletus, who afterwards built Rhodes. Docks, magazines, and an exchange for merchants were also constructed on a grand scale, so as to make the Piræus a port suitable for commerce on an extended scale. It was about this time that the treasury of the Hellenic Confederacy was transferred from Delos to Athens, a change which added greatly to the power and resources of Athens. After waging many wars with chequered fortune, but of which the result, on the whole, tended to extend and consolidate the empire of Athens, a peace was concluded with Sparta, B.C. 445, which gave a short interval of rest before the outbreak of the Peloponnesian war. It was in this interval that Pericles, having secured the Piræus and Athene by completing the vast scheme of fortifications originally planned by Themistocles, turned his attention to the adornment of the city. It was then that the Parthenon was commenced, which was completed 437. The Propylæa, the building of which was carried on from B.C. 437 to 431; the Odeum, a musical theatre, of which the roof was made of the masts of Persian ships taken at Salamis; the great temple of Demeter at Eleusis; the temple of Nemesis at Rhamnus; the temple at Sunium, and the Erechtheum on the Acropolis were all commenced probably about this time. Professor Newton then explained the drawings by which the lecture was illustrated, and which comprised views of the Acropolis taken from different aspects, a restoration of the Propylæa, and a view of it in its present ruinous state, a restoration of the east front of the Parthenon, a view of the Erechtheum, and a plan of the Acropolis showing the most recent discoveries. He then gave a brief description of the architecture of the Propylæa, the Temple of Victory, the Parthenon, and the Erechtheum, Thesium, the paintings of Polygnotos, Myron, and Panænos, in the Stoa Poikile. The cost of the public works in the time of Pericles could not be exactly ascertained. The Propylæa alone, according to Heliodorus, cost 2,012 talents, a sum reckoned as the equivalent of £460,000. Leake thinks that in this amount must have been included most of the outlay on the Odeum, Parthenon, Elusinium, Propylæa, and Erechtheum, and calculates the whole expenditure on account of these at 2,950 talents. The whole amount is calculated by Grote at £690,000. The liberal expenditure on public works, dramatic entertainments, and festivals which distinguishes the age of Pericles had its source in the main in the wealth which flowed into Athens in the form of contributions, direct or indirect, from her dependencies. Plutarch, in a well-known passage, draws attention to the fact that these public works, so exquisite in their finish, were constructed in an astonishingly short time. They were, as he expresses it, made quickly to last long.

At a special meeting of the members of the Derby Mechanics' Institute, held on Wednesday week, plans prepared under the direction of the committee for the erection of new premises in the Wardwick, at Derby, at an estimated outlay of £4,500, were approved, and the committee was authorised to obtain tenders.

HARROGATE CONSERVATIVE CLUB COMPETITION.

THE choice in this competition has fallen, as we stated last week, on a design marked "X," by a local architect, Mr. Arthur Hiscoe. The object of the competition was to provide a large public hall, which is much required for an important town like Harrogate, also a suite of assembly-rooms with bed-rooms, and a Conservative club. The site fronts the Cambridge-road, and a footpath. Mr. Hiscoe has made the front elevation towards Cambridge-road, in the centre of which frontage is the door to the assembly-rooms; on the left of this entrance is an excellent refreshment-room, 30 by 18ft., properly connected to a kitchen at the back. On the west of the refreshment-room is a ticket-office, and on the left of this is the main entrance to the Alexandra Hall, with a secretary's-room on the otherside. The hall is 76ft. by 32ft. 6in., and will accommodate 500 people. Passage communication is made with the assembly-rooms, and the billiard-room fronts on to the footpath called Beulah-place. An entrance is arranged in the centre of this frontage, and is made the entrance to the Conservative club, with a reading-room on the left; in the corner there is also a smoke-room, each 18ft. by 14ft. The stairs from main entrance to assembly-rooms lead to a corridor 5ft. wide, which conducts to the gallery of the hall and the bedrooms. There are steps from the entrance in Beulah-place, which lead to the club-rooms, of dining-room 20ft. 6in. by 18ft., with necessary rooms connected; a reading-room 18ft. by 14ft., smoke-room and billiard-room, for two tables, two stories high. The w.c.'s and lavatories on each floor are well situated and lighted. The bakehouse is in the cellar, and the second floor is devoted to bedrooms, w.c., &c. The front elevation is certainly one of the most practical where expense is a condition. It has an Italian frontage to Cambridge-street, two stories and attic story. The whole of the entrances are well marked, and make an imposing elevation. A handsome portico of good Classic proportions adorns the three entrances, and the windows on the ground and first floor have cambered heads, the dormer windows having circular heads in the attic story. The roof over the entrance to hall is detached and higher than the other, and marks the entrance very well. The entrance in Beulah-place is in a projecting bay, and is carried up three stories, and a domed roof over a handsome Classical portico, and the cambered-headed windows makes this frontage worthy of being a frontage to an excellent street.

The design which is placed second in order of merit is one marked with a Star for a motto, by Mr. R. Dyson, of Harrogate. The leading feature is the connection of the entrances to the hall and assembly-rooms, which are only separated by a wall. On the left of the entrance to the assembly-rooms (which are, by the way, very narrow, a fault spoiling the design very much) is placed the coffee-room, and at the back is the public hall, 70ft. by 30ft. This is all that this entrance leads to, no ticket-office being shown. The adjoining entrance is equally narrow, and leads only to the various committee-rooms. The chief entrance is in Beulah-place, in the centre, with a dining-room on one side and a reading-room on the other. These are for the Conservative club, while the entrance passage leads into a hall of excellent proportions, in which a handsome flight of steps is shown to the other club-rooms, comprising the billiard-rooms, coffee-rooms, and other rooms so necessary for a building of this kind. There is also another smoke-room over the dining-room of the ground-floor. The elevation spoils the design, having the chief entrance at the end; but probably the author, Mr. Dyson, considered that, on account of the small sum of money that was to be laid out on so large a building (only £3,000,) it was better to make a frontage of less length than that to Cambridge-road. The elevation, however, is good, and the best drawing of the whole. It is Classical, in three stories of the three different orders, the door being in the centre. Three-light windows are placed on each side, all with semicircular heads; a gable is placed over the bay in which the entrance-door is shown, and a parapet over this with an open colonnade. The cornices and dentil courses inseparable, however, from a Classical elevation of this kind must add materially to the expense. The elevation to Cambridge-street shows ordinary square-headed windows on the ground-floor, and cambered heads to the floor-windows, which range in one long

row. The building is on this side only taken up two stories and attics, which are lighted with circular-headed dormers; but this frontage will not compare favourably with that to the end elevation. The large windows to the coffee-room, with relieving arches over, and projecting chimneys built out from first floor, should not belong to the same building as the open colonnade of the end elevation.

"Café" (by Messrs. Perkin and Bulmer, of Leeds and Harrogate), is a good design. It shows two elevations towards Cambridge-street, with a good ground-plan, in which the entrance is made on the extreme left of the building, and leads direct into the Alexandra Hall, 75ft. by 34ft. The club dining-room is on the right of this passage, and occupies the frontage. In the centre is the entrance to the assembly-rooms, with the coffee-room and kitchen on one side, and a smoke-room opposite and the steps. The billiard-room is to Beulah-place, in the north corner, and the S. E. corner is the entrance to the club, which is again upstairs with smoke-room, dining-room, card-room, and billiard-room, 35ft. by 24ft., over club dining-room and entrance to public-hall. There is an excellent hall at the end of the staircase on the first floor, which is an advantage over any of the other designs. The front elevation, which is certainly the best, shows a large gable in open timber, in centre of building, and the whole of the attic story is in open timber-work. The club dining-room, and the billiard-room over, are only two stories high. A bay-window is shown at each side of the main entrance to assembly-rooms, which stops under the open-timber gable. The end is also in open timber, as is the front, and if it were to be built, it would reflect great credit to the architects. The windows and doors are square throughout, and, like the whole of the other designs, it is proposed to be of pitch-faced stones and ashlar dressings apparently. The alternate elevation is an Elizabethan design, with two gables to main building two stories high, with a Mansard roof, and sky-lights for attic-story, and the entrance to the hall is roofed with a hipped roof.

The whole of the drawings are got up in pencil only and colour, and the one which has had the greatest pains taken with it is undoubtedly one by Mr. Geo. Mallinson, under the motto of "Mon Patria." It shows a large hall, like all the others, on the left of the principal frontage to Cambridge-street, with committee-room on the left of the entrance to same; on the right are smoke- and dining-rooms, and are connected with entrance to assembly-rooms, and a billiard-room is placed at the back, and lighted from Beulah-place. In a similar manner to the last-mentioned design, the entrance is placed at the corner of Beulah-place and Cambridge-street, and the stairs run up from an octagon hall to the club on the first floor, which are ably designed to give easy access to a large billiard-room suitable for two tables, and a committee-room, as well as smoke and other rooms, necessary for a building intended for such a purpose. It is so capitally arranged, that we venture to say that, if the elevation had in any way compared with the plan, the allotment of the designs would have been different. The elevation shows one huge ugly Mansard roof and gable only, relieved from dreary hideousness by an excellent turret, and arranged in the corner and over the entrance to the club-rooms. It is a pity to see such a plan so spoiled in the elevation. The other designs (only two or three) need no special mention.

LONDON SMOKE, ITS COST AND CURE.

A LECTURE was delivered on Wednesday night at the Society of Arts, John-street, Adelphi, by Mr. W. D. Scott-Moncrieff, C.E., entitled "Suggestions for Preventing London Smoke, and Making it Commercially Available." Mr. R. Rawlinson, C.B., occupied the chair. Referring to the present condition of London as regards its fuel, the lecturer said there were, leaving out the question of coke, about four millions of tons of coal consumed in London every year, in addition to which about two millions of tons were used by the gas companies for the purpose of extracting light. All this quantity was passed through retorts, and, after a large amount of bad gas had been extracted, it was converted into coke and cinders, the average amount of gas extracted from one ton of coal being 10,000 cubic feet. The result of practical experiments had proved to him (the lecturer) that by extracting only from 3,000 to 5,000 cubic feet per ton, instead of cinders, there remained an excellent and smokeless coal, and the gas extracted, instead of being only 16-candle strong, was 24-candle strong. What he, therefore, proposed was that the gas companies, instead of taking 10,000 cubic feet of gas per ton from 2,000,000 tons of coal, should extract 3,333 cubic feet per ton from 6,000,000 tons, the whole quantity required for consumption in London. The result would be that the companies would have double the quantity of products they had at present in the shape of tar and ammoniacal liquids; the community would have 24-candle instead of 16-candle gas; the fuel resulting from the process would light readily, and would make a cheerful fire, giving out 20 per cent. more heat than the common coal now in use, and, what was most important, there would be no smoke from it. He then went on to show by figures that if the whole of the 6,000,000 tons consumed yearly were treated in this way, the value of the gas extracted would be £1,750,000 more than under the present system, and the coal could be sold at a cheaper rate than now. In conclusion, he said statistics showed that if the system were carried out there would be an annual saving of £2,125,000, which might be taken as the yearly value of London smoke. London would then be a smokeless city, and all that would have to be deducted from the £2,125,000 per annum would be confined to a few items, such as the cost of additional capital required for transit, appliances, and the terms to be made with the gas-companies for carrying out the scheme.

KITCHEN-BOILER EXPLOSIONS.

THE usual list of killed and wounded from kitchen-boiler explosions has already far exceeded its average annual proportions. There is not the slightest reason why a kitchen or bath-boiler should ever explode if properly fixed by a plumber who has the smallest amount of common-sense. Mr. Thomas Fletcher, F.C.S., of Warrington, points out:—There are two simple ways by which an explosion can be totally prevented—one by fixing a dead-weight safety-valve, which should be for convenience fixed when the apparatus is put up first. The other is to cut a hole in the hot-water return-pipe a little distance above the boiler, this hole being from ½in. to 1in. in diameter, and to solder over this a piece of sheet lead about 1-32in. thick, just sufficient to safely stand the general water-pressure, making, in fact, a weak place in the system of pipes which will be the first to give way. This hole must be cut in such a position that the pipe is certain to be warmed from the fire, and as near as possible to the boiler. It must also be where, in case of the sheet-lead being blown out, the water will not be thrown into the room, but into the fire, so as to extinguish it. Any plumber should do this for a shilling or two, and although it is liable to make a mess, it only does this when an explosion would occur in its absence. It is also easy to put an escape-pipe, through which the water could be led away to the outside of the building in case of accident. This thin lead safety-disc might be made so as to fix in a brass socket and be easily replaced if an accident did occur. There are many simpler, cheaper, and more satisfactory arrangements for circulating boilers, which can be fixed at less than one-tenth the cost, and of all these the best is a galvanised iron or copper cylinder of about eight gallons capacity, with a tap, and a good gas-heating burner underneath it, the cylinder having a loose lid and a water-supply tap over it for filling as required. After some months' daily experience with this, there is no doubt that it is far cheaper to use than the circulating boiler system, and far more useful for general work. It has also the advantage of absolute safety under any possible condition.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

CUMBERLAND AND WESTMORELAND ANTIQUARIAN SOCIETY.—The winter session of this society was held at Penrith on Wednesday and Thursday in last week, in the Assembly-room, where a loan collection of ancient arms and armour had been brought together. A visit was paid on the first day to Brougham Hall, where the private chapel and the collection of armour in the hall were inspected, and a paper on "Armour" was read by the Rev. T. Lees, of Wreay. In the afternoon, a paper by Dr. Stephen, of Copenhagen, was read on the Runic stone found at Brough, which was stated to be the first inscription in Runes discovered in Westmoreland, and purported to be the grave-kist of Cimokom, wife of Alh; the probable date was the later part of the 6th century. The Rev. H. Whitehead read a paper on "The Old Church Plate in Brampton Deanery;" the Rev. T. Lees one on "Sculpture at Longmarton Church"; and Mr. Joseph Robinson one on "Roman Remains near Wolsty Castle." These consisted of a square camp, resembling those at Risehow and Bowness, but differed in having very deep foundations but no internal floors. On the second day, Mr. R. S. Fergusson read a paper on the alleged "Labarum at Carlisle Cathedral," recently discovered by Precentor Venables. He produced a copy of 315 masons' marks found in the Cathedral, and stated his belief and that of Mr. Creed, the clerk of works, that the alleged sacred monogram was merely a Mediæval mark placed on a stone by masons who quarried it from the Roman wall. In this Mr. Lees and others agreed, it being stated that Mr. Venables had made a mistake. Sir George Duckett read some notes on "Royalists' Memoranda, tempo Charles I.," and a discussion after took place on the stone circles at Raisbeck and Maughanby.

PARLIAMENTARY NOTES.

THE ARTISANS' DWELLINGS ACTS—Sir R. Cross intends to move for a Select Committee to consider the working of the Artisans' Dwellings Act, 1875, and the Metropolitan Streets Improvement Acts of 1872 and 1877, and especially to inquire into the causes that have prevented the reconstruction of dwellings for the poorer classes to the extent contemplated and authorised by those Acts. This motion originally stood in the name of Sir Sydney Waterlow, but it has been arranged that it should be placed in the hands of the late Home Secretary. The motion stands for to-day, but there is not much chance of its being reached.

THE REMOVAL OF SNOW IN LONDON.—Sir H. Verney on Monday asked the Chairman of the Metropolitan Board of Works whether his attention had been drawn to a description in *The Times* of the 20th inst. of the plan adopted in the city of Milan for clearing away the snow by dividing the city into districts; and whether he would direct that arrangements should be made now, and in case of future snowstorms, for this purpose, the work being carried on by night as well as by day all through the metropolis, including the parks, the snow being carted to the Thames and other waters, and thus work given to thousands of men who are thrown out of employment by the weather. Sir J. M'Garel-Hogg: I beg to state that I have observed the description in *The Times* to which he refers; but it is not in the power of the Board over which I preside to adopt that or any other plan of clearing snow from the streets of the metropolis, which are under the sole charge of the local authorities. I think I may say, however, from inquiries instituted in some of the largest parishes, that great exertions are being made to grapple with the present difficulty. On the Victoria Embankment, over which my Board has control, 400 men, 40 carts, and two snow-ploughs were employed for nearly three days in removing the snow, beginning work at 3 o'clock in the morning. This shows the immense quantity that fell, and I may had that, assuming a depth of 6in., the fall of snow over the whole metropolitan area of about 117 square miles has been roughly estimated at the enormous amount of 8¾ millions of tons. The House will see that to cart all this away in a few days, in many cases to a considerable distance, would be a matter of absolute impossibility.

FLOODS AND DRAINAGE.—The Government Bill to make provision for the conservancy of rivers, the prevention of floods, and other matters, is to be known as the Rivers Conservancy Act, 1881. It provides that any 20 or more owners or occupiers of land rated at not less than £2,000, or any conservancy or sanitary authority having jurisdiction within any part of a river basin, or contiguous river basins, may apply to the Local Government Board that such basin or basins may be constituted a conservancy district, and that a conservancy board may be established. After local inquiry the district may be established by provisional order subject to the following regulations:—1. Wherever just and practicable the district shall be divided into three descriptions of land, (*a*) lowlands, (*b*) midlands, (*c*) uplands, and each of the said descriptions shall contribute in a different proportion to

the expenses, or part of the expenses of the Conservancy Board as may appear equitable. 2. The highest rate in the pound payable by any lands declared to be uplands shall not exceed one-sixth part of the rate in the pound payable in respect of the lands in the district which pay the highest general rate. 3. In constituting the board care shall be taken to secure thereon an adequate representation of owners as well as of occupiers, and provision shall be made wherever circumstances shall require for the representation of urban sanitary authorities, conservancy authorities, or other similar bodies. The powers of the conservancy board will be for the prevention of floods, for arterial drainage, for the storage of water, for the irrigation of land, or any such purposes. The boards will have powers as to works, as to giving compensation, as to acquisition of land, as to survey of water-courses, and as to enforcement and commutation of liabilities. The whole of the expenses of the improvement of works and of the construction of new works, and one-half of the other expenses incurred by the board shall be borne by owners of land within the district. The remainder of the expenses incurred by the board shall be borne by the occupiers of the lands within the district, and the Conservancy Board shall provide a fund, to be called the Conservancy Fund, to be raised by rates made on the owners and occupiers of lowlands, midlands, and uplands within the district of the Board, on the basis of the ratable value of the property assessable to the poor rate. An urban sanitary authority may be constituted a Conservancy board for their district; and where so constituted, the Local Government Board may provide that the expenses incurred by such authority may be wholly or partly borne by the general district rate, or other rate out of which their expenses as such urban sanitary authority, under the Public Health Act, 1875, are defrayed.

Building Intelligence.

BATTLE CHURCH, BRECONSHIRE.—This church has just been reopened after a complete restoration, undertaken at her own expense by Lady Cleasby, widow of the late Sir Anthony Cleasby, who is buried in the churchyard. The church, situated in a wild mountain district, is a small plain structure of the Perpendicular or Tudor date; the chief features being a good segmental oak roof, with well moulded intersecting ribs and cornice, and a good Perpendicular east window. The roof has been repaired where necessary; the whole of the windows and stone dressings carefully renewed; a porch with oak roof and traceried barge-board added to the north doorway; a small vestry added on the south side. The whole of the old fittings, which were modern and without the least merit, have been removed and replaced in pitch-pine varnished. The chancel floor has been raised two steps, and an open screen in pitch-pine on a plinth of Forest of Dean stone erected between it and the nave. Godwin's encaustic tiles have been laid in chancel and nave. A font of elaborate design has been well executed in green Bridgend stone by Mr. W. Clarke, carver, of Llandaff. A reredos in pitch-pine, with inlaid texts and carved cornice, will be fixed at the east end. The work has been carried out by Messrs. Williams and Sons, of Brecon, from the designs of Mr. J. Bacon Fowler, architect, of Brecon and Swansea.

BRISTOL.—New premises for a local firm of spirit merchants have just been completed at Bristol from the designs of Mr. J. Bevan, architect, of that city. The building will have a frontage of 179ft. on the north or New Baldwin-street side, and 55ft. of east frontage in Marsh-street. The cellarage alone covers 9,000 superficial feet. From the street-level to the top of the dormers the height is 60ft., and to the top of the turrets 80ft. The building is in the French Renaissance style. Messrs. Wilkins and Sons, of Bristol, have been the contractors, and the work has, during the past two years, given employment to some hundreds of men. The carving has been done by Mr. E. Sheppard, of Bristol.

DARLINGTON.—Extensive alterations and additions are about to be made to the Wesleyan chapel, Bondgate, comprising the lengthening of the chapel from east to west, new entrance, lobbies, repewing, new pulpit, and the enlargement of present vestries, and erection of new vestries and committee-rooms. Mr. G. G. Hoskins, F.R.I.B.A., of Darlington, has been entrusted with the work.

DALRY, EDINBURGH.—The memorial-stone of a new Free Church, which is in course of erection on a site at the west end of Dalry, was laid on the 15th inst. The building, which has been designed by Mr. Raeburn, architect, is in the Gothic style. The principal features in the front gable elevation are a deeply-moulded doorway and a large four-light window with tracery. Buttresses rising into pinnacles above the roof also impart character to the design. At the west corner there is to be a spire rising to a height of about 130ft., with belfry and clock. Above the belfry the spire breaks into the octagon, and is surmounted by a weather-vane. The church is designed to seat 800 worshippers, and it is to cost about £5,000.

NANTWICH.—The new children's home and schools for Nantwich union, adjoining the workhouse, are now almost ready for the reception of the children for whom they are intended. The exterior measures some 77ft. in length by 20 in. depth. The building is semicircular in design. The heating arrangements, we may add, were provided for by Mr. E. H. Shorland, of Manchester. The schoolroom will accommodate some 70 scholars. The contract for the home and schools has been satisfactorily carried out by Mr. James Madely, the contract being for £3,200, Mr. J. Heywood being his foreman over the workmen. Extensive alterations have been made also at the workhouse itself by Mr. Madely, whose contract is for £1,460.

NORWICH.—A large block of buildings, which have been erected at the corner of Redwell and Princes-streets, for the accommodation of Princes-street Congregational Chapel Sunday-schools, were opened on Monday week. The chief façades are Classic in character, and are built of white brick with mouldings and dressings of ornamental Cossey bricks. On the principal floor is a lecture-hall 62ft. by 39ft. and 32ft. high, accommodating 700 persons. The roof of hall is coved and panelled, and has a cornice and bold corbels, and light is given by a long lantern 24ft. wide. On three sides is a overhanging gallery 8ft. wide with iron balustrade, and on the fourth side is an apsidal recess for organ, with a lower and upper rostrum in front. Beneath the gallery are doors opening into a series of class-rooms, ranging from 12ft. by 9ft. 6in. to 19ft. by 12ft., a library and superintendent's, and secretary's rooms, and at the end of hall, on gallery level, are two large class-rooms, with folding rooms opening into the main room. The woodwork is of pitch-pine, varnished, and the corridors and passages are paved with Minton's tiles; the heating is by hot-water, supplied to every room on Perkins's principle, and the ventilation on Tobin's principle. Beneath these principal buildings in the basement are two class-rooms 37ft. by 28ft. and 26ft. by 25ft.; three smaller infants' rooms each averaging 16ft. by 10ft.; a mothers' meeting-room 38½ft. by 25ft.; a church-parlour 34ft. by 26ft., and furnished as a drawing-room; kitchen 20ft. by 12½ft., and heating chamber. Mr. Edward Boardman, F.R.I.B.A., of Norwich, the architect of the adjacent chapel, designed and superintended the erection of the buildings, and Messrs. Downing and Sons were the builders. The total cost of building and fittings was £12,605, including £4,450 for site.

CHIPS.

The annual meeting of the Hull School of Art was held on Thursday, the 20th inst., when Mr. Menzies, the head-master, reported that the increased comfort and accommodation of the new premises in Albion-street had considerably increased the results in the examinations. In the national competition, one bronze medal and two book prizes were obtained, and in the third grade competition, 19 prizes; in the second grade local examination, 17 students obtained 19 prizes, 64 passed in one or more subjects, and 11 obtained full certificates.

Mr. H. Scott Hayward, of Frocester, Gloucestershire, has been appointed surveyor and inspector to the Inclosure and Copyholds Commissioners, in the place of the late Mr. Marcellus Newtown.

A new house for Mr. A. W. Vaisey, at Tring, is about to be erected. It will be faced externally with black chalk flints and bright red brick quoins to angles and reveals up to first floor level, and above (except to one or two gables) with ornamental dark red tile hangings; the roof will be covered with Broseley tiles. The contract is let to Mr. James Honour, and Mr. William Huckvale, of Tring, is the architect.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

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"BUILDING NEWS" DESIGNING CLUB.

BONUS HOMINUS. (The description of "Frank's" design applies also to yours. They are both alike in general plan. The mottoes are rightly distinguished, but "canted corner dwelling" should have read "canted corner dwellings.")—K IN CIRCLE. (A small sketch of sedilia will do.)—EPHRAIM. (Too late for review.)

DRAWINGS RECEIVED.—R. M. F., W. H., E. H., L. B., R. D., W. E. L. J., W. H., T. C., W. H. N.

Correspondence.

THE INSTITUTE EXAMINATIONS.

To the Editor of the BUILDING NEWS.

Sir,—It is the intention, I see, of the R.I.B.A. to institute an examination for future associates ere admitted. The young aspirant will probably think that the ordeal should be submitted to by all the existing members; that those who make the rules should submit to the ruling. If examination is necessary for the associates, why not for the Fellows? Is it not more necessary for the Fellows than the juniors? I certainly do not consider the Fellows up to the right standard, and at a late meeting was struck by the disadvantageous light in which the Fellows appeared from their ignorance. It was the evening when the paper was read on the Isle of Wight Roman antiquities. One Fellow, supposed to be our authority in Classical matters, had to be informed by a visitor that glass for windows was used by the Romans. Another Fellow showed his lack of general information by asserting his belief in fossilised human brains (in a *figurative* sense, the statement is only too true), and none of the Fellows present had *gumption* enough to put right the two wild theorists, one of whom asserted that the Romans only built their walls about 3ft. high, and that the upper portion was wood framing and plaster; the other that a specific meaning was attached always to a certain geometrical form. These people will now ride their hobbies more furiously than ever, their assumption being uncontradicted that the R. I. B. A. coincides with them. The idea about the Roman buildings is an utter delusion. The Romans were good constructors and fond of

stone, and such materials were abundant. To make the upper portion of walls of wood-framing, would have been more trouble and expense than using stone, and would have had no advantage. It may therefore, safely be said that *the walls were of stone their whole height*. But how, then, Mr. Smith would say, can you possibly account for the circumstance that in so many different parts of the country, the walls of Roman buildings are found about the same height. The reason is, that the same conditions have befell all, and the history of this Isle of Wight example will suffice.

Here, as everywhere else, where the Romans penetrated, they settled down to remain. They built handsome houses and made themselves at home, and no doubt much benefitted the natives, but unhappily did not teach them arms, so that when at length the Romans left, the northern rovers made this kingdom their prey. The Roman villa now under consideration, when deserted by its first masters, would doubtless be taken possession of by the natives, who were not long, however, in tenancy. In the middle of the fifth century, the Jutes made a raid on the island, plundering and destroying. The villa would attract their attention, of course. It was no doubt rifled of all portable valuables, and then set on fire. As only one skull was found, it would seem there was little defence made against these savages, as they probably would exterminate the scant population. The bare walls of the villa would now stand forlorn and dropping slowly to decay for the next six hundred years, civilisation being blotted out by the Northmen. In the eleventh century, stone building was revived, though in a rude fashion. The workmen, without much skill or proper tools, would, we may be sure, eagerly seize on the materials of the ruined villa in preference to quarrying new stone. There is abundant proof that this was generally done, and so the walls of the villa would be rased to the ground-level, the goodness of the Roman mortar and want of tools preventing the destroyer's going lower. But this level of the eleventh century is not the same level as of Roman times. It is 2ft. to 3ft. higher, the ground by mouldering of stone and decay of vegetable matter having risen. From the eleventh century to the nineteenth the ground has still been rising, though the increase, partly by woods being cut down, and from agricultural use, is not so great as before. The first rise of ground gives the height of Roman remains as now found. The second period covers to a depth of about 2ft. the top of the walls. In towns the case is somewhat different. The walling materials was sooner made use of, so that little beyond floors are found, and from the great quantity of building debris, rubbish and dirt in towns when unpaved, the accumulation of soil has been much greater than in country places, where the villas are usually found. In towns Roman remains are usually 15ft. or 20ft. below modern level.

As regards the other theory, of the geometrical figure, mentioned by a visitor at the meeting aforesaid, suffice it to say that the simple radical forms of square, circle, and triangle have been used by all nations at all periods possessing any taste for ornament, with or without relation to any particular religious dogma, and so they will continue to be used, as none others can be invented; but religious ideas do not necessarily accompany their use. The practice, I beg to note, at present ruling in the Institute of abbreviating the papers read for publication, so taking out all their life, light, and spirit, is a very stupid one.—I am, Sir, &c. M.

SIR,—As passing a compulsory examination is to be the diploma of all candidates for the architectural profession this year, I have for some days been inquiring in my own mind the extent and time which this enforcement will take to remedy some of the evils at present existing in the profession. The opinion of its members at large upon so important a matter, though your valuable columns, will, I think, be gratefully acknowledged by all.

The most important inquiry may be: Is there any remedy at law to immediately put down all who have been practising in the name of "architect" who are not properly qualified men? Further, will it have any influence in abolishing a perhaps worse evil—that of underselling in the charges of professional practice—one too common amongst many equally qualified men in this as in other professions.

One other inquiry may be made by some of our junior members—namely, are all who are at present students of architecture not in practice to pass their examination before they can enter upon a private practice for themselves?

If there is, under the present rules of the profession, any hindrance to the remedy of the evils mentioned, they should now be put into new form.—I am, &c.,

DESIDERATUM.

THE SHEFFIELD PARISH-CHURCH FONT COMPETITION.

SIR,—In reply to a recent query as to whether this matter is settled, I beg to say the award was, in due course, made to Mr. Charles Green, of Sheffield, and that this gentleman is at present carrying the work out. How far it will be in accordance with our accepted views of what is correct time will of course show!

Canon Blakeney, the present Vicar of Sheffield, is an old and esteemed friend of my own; and I have, as well, many family ties connecting me with Sheffield and its church. When, therefore, it was decided that the designing of this memorial font should not be entrusted to the local men (Messrs. Flockton and Gibbs) who were then engaged upon the church, I strongly urged the Committee to procure designs from some architect of acknowledged standing, and then get him to procure some good and tried man to execute the work. This, however, was overruled, and an entirely open competition decided upon.

It will be remembered that, at the commencement of the restoration, the work was placed in the hands of Messrs. Flockton and Gibbs, of Sheffield, in connection with the late Sir G. Gilbert Scott, R.A., as consulting architect. Had the latter gentleman been spared all would have been well.

At the time when the competition for the font in question was advertised, Messrs. Hadfield and Son, of Sheffield, whose clever Gothic work we are all more or less acquainted with, wrote to the professional journals, saying it would be impossible for them to intrude a design into a building other architects were engaged upon, and this feeling was, no doubt, shared by many others in the profession. But I venture to urge that it would have been better for the public weal if the Messrs. Hadfield, or some other architects of ability, had seen their way clear to secure to Sheffield's ancient parish-church a font of a character worthy of its surroundings.

I do not say that this will not be so as it is; but without having had any opportunity for seeing the accepted designs, I shall venture to assert that this is very doubtful; for, Mr. Charles Green—although an artist of no mean ability—is, I believe, no lover of Gothic.

Many of us find ourselves in Belgium every now and again; and as we pace the grand old Flemish churches, we gaze with mixed feelings at the huge summer-house-like pulpits which adorn so many of them. These pulpits are perfect marvels of wood-carving; in skilful workmanship they surpass anything that we people in England can do; and yet, they are so out of character with the immediate surroundings, that we look at them, hardly sure whether we ought to rejoice most in their wondrous art-power, or lament their utter want of sympathy and of character with the building they form a part of.

Four miles or so from Sheffield is Rotherham. The parish-church of this latter town is of about the same date, and is even finer than that of Sheffield. It was restored some six or seven years ago, by Sir G. G. Scott.

A memorial font to the late Vicar, who died a year or two ago, being proposed, a design by request was prepared by Mr. J. P. Seddon, of Queen Anne's-gate, W.C., and was illustrated at the time in this paper.

Mr. Seddon was good enough to entrust the carrying out of his design to myself, and by Whitsuntide the work in question will be *in situ*. It will be instructive, when both are in place, to compare their respective merits, and then, for everyone to judge for themselves which course seems productive of the best results.—I am, &c.,

HARRY HEMS.

Exeter, Jan. 22, 1881.

SHOULD SOIL-PIPES BE FIXED UP OUTSIDE OR INSIDE HOUSES?

SIR,—This is a subject upon which considerable difference exists both amongst architects and plumbers, and, as a good deal of that difference is owing to the supposed extra danger from frost if the pipes are fixed up outside, this is the very time to discuss the question.

At page 391 of your issue for May 17th, 1872, I referred to this in connection with "Fig. 112," which showed a vertical soil-pipe fixed up outside with a lead branch pipe coming into it—part of this lead branch-pipe being exposed outside—and I then stated that if the vertical pipe got frozen up, this lead branch-pipe was often useful by admitting of a slit being cut in its top which would allow the water often to flow out harmlessly outside and so prevent the house being flooded. The cutting of this slit may allow a kitchen-sink to be used after the vertical iron pipe has been frozen up. In cases where the soil-pipe or waste-pipe gets frozen up even although fitted up inside of the house, as is the case at present in properties I know of, then no such "safety-valve" in the shape of "cutting a slit," as above referred to, can be done; so that even in this matter of freezing-up, an outside soil or waste-pipe has some advantage over an inside one.

Looking at the matter from various standpoints, and especially considering what is best for the safety and health of the inmates, I support the idea that, as a rule, soil-pipes (and waste-pipes too) should be *outside*. This is recommended in the model by-laws of the Local Government Board of A.D. 1877; and, in reply to the objection as to extra annoyance or danger from temporary freezing, I remark:—*Take precautions*.

As to these "precautions," I may first observe that it is not the soil-pipe that freezes, but the water in it. No water should be in it, however, except in the act of flushing, and that will hardly freeze it up. What causes soil-pipes and waste-pipes to freeze up is generally a continual leakage from some crane or valve, &c., that does not, or is not, shut when it ought to do so. A leaking ball-crane in a cistern, if the cistern overflow enters the soil-pipe, is almost sure to produce a frozen-up soil-pipe. I have a case of about 60ft. of frozen-up soil-pipe from this cause. Had the cistern-overflow discharged outside and where it could be seen, I do not expect the soil-pipe would have been frozen up, even although it is outside. Other outside soil-pipes, where there has been no such leakage, and where the cistern-overflow does not enter the soil-pipe, are not frozen up, even where there are several water-closets into one soil-pipe. As water requires to be in the traps, putting salt-water down, especially last thing at night, would help to prevent them getting frozen up.

A second "precaution" for the soil-pipe itself is to fit up one of a good thickness of metal. If the vertical pipe is iron, then, instead of being only about one-sixteenth of an inch thick, it should be a cast-iron pipe one-quarter of an inch thick, and get several coats of paints. If a still further "precaution" is wished, then the vertical pipe may be boxed up inside of a neat wooden case, as high up as the water enters, and also filled round with sawdust or other non-conducting substance. The hole in the wall where the branch soil-pipe comes out at should be tightly plastered or filled in all round the pipe to prevent a draught of cold air blowing in under or alongside of the pipe. These cold draughts often cause pipes to get frozen up. Wrapping up the pipes inside with felt is, of course, a good preservative.

One reason which may be termed "scientific" as well as sanitary, which I do not remember of having seen referred to as yet, for placing the soil-pipe outside, and which may be especially worth mentioning while the present aërial crusade against the bad air in our towns and cities is being waged, is that a soil-pipe placed outside *generates and discharges into the air* far less sewage gas than one fitted up inside.

It would be an advantage to hear the opinions of some of your other correspondents upon this question at this time, and especially if they would state how their soil-pipes are fitted up, and what they are made of, and how they stand as regards the above "precautions."—I am, &c.,

W. P. BUCHAN, S.E.

21, Renfrew-street, Glasgow, 22nd Jan.

HOUSE-SANITATION.

SIR,—I should be glad if you would allow me to protest against Lieut.-Col. Jones's remarks

with reference to what I said in opening the discussion on Mr. Robins's paper at the Royal Institute of British Architects.

The fact that three books from my pen have recently appeared, in each of which the principles and practice of house-sanitation are set forth, one being entirely devoted to that subject, and that I have given a very large number of public lectures on it to all classes of hearers, shows plainly enough that my aim has been "to spread the knowledge of the very simple rules of health"; and if Lieut.-Col. Jones will take the trouble to look at either of those books he can satisfy himself that this is the case. I think that the more people know about the sanitary arrangements of their houses the better; but I said, and repeat it most distinctly, that a person who is not practised in carrying out sanitary works is not competent to put his own house in order; that no amount of reading can give that practice, any more than reading can enable a man to dispense with the services of a surgeon when he has to have his leg cut off. I say that it is a most absurd and mischievous thing to advise people to take upon themselves the responsibility of putting their houses into a proper sanitary condition; that in every instance that has come under my own notice, a sense of security has been given which has afterwards been shown to be false; and I will add that no one, who was himself aware of the numerous pitfalls in the way of sanitary practice, would ever dream of giving such advice to householders.—I am, &c.,

W. H. CORFIELD, M.A., M.D. (Oxon.),
Professor of Hygiene and Public Health at University College, London.
10, Bolton-row, Mayfair, W., Jan 27, 1881.

MODERN DOMESTIC ARCHITECTURE.

SIR,—Mr. Davie, of Pembroke-gardens, Kensington, in his letter in your last issue, "deplores the numerous failures" made in the Queen Anne revival. He may well deplore them—such elevations for instance, as that of the Chiswick School of Art, with its corbelled-out pilasters, broken pediments, serrated wall-head, and badly-proportioned almost everything. The façade seems as if it was broken away at its extremities in the centre of a solid between two openings, showing weakness where, if anywhere, there ought to be strength. A design in the same style for the Liverpool School of Art (published in a contemporary), is not much better, with its pilaster resting on a window-cornice!

But why should a style, so free for all impurities, be selected for—of all purposes in the world—a *School of Art?* impurity meeting the student upon the very threshold. When our University buildings were designed, it was ably argued that the style ought to have been Classic; and for a building devoted to such a purpose as the teaching of Art, surely no style could be more appropriate than the noblest of all—the Greek.

Mr. Davie casts a longing and a loving eye towards the Gothic, and points out where, in London, some good modern examples may be seen. In Glasgow it would be eqully easy to point out admirable examples of Greek in buildings designed to meet modern conditions—churches, warehouses, town-residences, and in its neighbourhood, villas.

How is it that with all the perpetual talkee-talkee about "high art," there is no endeavour to revive in architecture the highest of all art?—I am, &c.,

DELTA.
Glasgow.

DISTRICT SURVEYORS.

SIR,—"That which in the captain's but a choleric word, in the common soldier is flat blasphemy." Excuse any slight verbal error in the quotation, as I am writing without the book.

A large red-brick building is in course of erection for an eminent firm in Bishopsgate-street, which is, I believe, the design of an eminent Queen Anne architect, and, being in the City, is under the supervision of an eminent District Surveyor. The moulded-wood window-frames are set within an inch of the exterior face of the brickwork, in clear contravention of the provisions of the Metropolitan Buildings Acts, which neither District Surveyor nor Metropolitan Board of Works are authorised to modify. What I want to know is, how it occurs that these eminent gentlemen break the law with impunity, whilst I and others of my calibre are pounced upon at once, if the slightest infringement of the rules of the Act is made by us?—I am, &c.,

R. FREEMAN.
Fenchurch Buildings, E.C., Jan. 25, 1881.

"THE WONDERFUL STOVE."

SIR,—When Mr. Burges has seen the above, I, in common with other of your readers, would be glad to hear his opinion of it.—I am, &c.,

JOHN P. SEDDON.
1, Queen Anne's Gate, Jan. 26.

HOTEL DE VILLE, BRUSSELS.

SIR,—Allow me to confirm your corsespondent "M.'s" able letter on the above drawing, in your issue of Dec. 24th, 1880, by Mr. H. C. Brandling.

I think he has done a good service by bringing to notice a *few* of the inaccurices most noticeable.

I have a photo taken in 1879, whilst the north portion was undergoing repair.

In the fifth paragraph of letter, p. 85 "M." speaks of the parapet at top as being different on the north of tower to that on the south—it is just the same; the only difference being the number of bays: on the south are five bays of two windows each; on the north are three bays, that next the tower of two windows; bay in the middle *three* windows; and bay next angle tower two windows.

To correct the drawing would take *too* much of your valuable paper, so I refrain; but will notice a few of the most glaring inaccuracies. To the left (south) of the hotel is a street Rue de l'Etuve. The drawing barely shows a court, and shows a house that does not exist. The proportion of the most *beautiful* Spanish houses on the right or north of market-place is bad; the beautiful architecture, sculpture, and gilding is simply spoiled; the market-place is so *un*faithfully represented that one would hardly think, from the drawing, the hotel stood on the top of a hill or incline.—I am, &c.,

F. A. BARTH.

Intercommunication.

QUESTIONS.

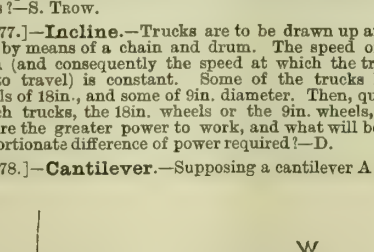
[6374.]—**Jacobean and Queen Anne Styles.**—Will some of your readers kindly give names of works, cost, and where to be obtained, of one or two inexpensive publications, with details of dwellings?—J. S.

[6375.]—**Asphalte Paths.**—Would some of the readers of the BUILDING NEWS kindly give me the proper method of making and laying asphalte suitable for garden-paths, yards, &c.? I have made several lots lately, but it does not set satisfactorily.—ASPHALTOS.

[6376.]—**Limestone Roads.**—Will some brother-surveyor kindly tell me if the rules given in Law and Clark's book on "Roads and Streets for Granite" are applicable to limestones, and where I can get a work treating on the construction and maintenance of limestone roads?—S. TROW.

[6377.]—**Incline.**—Trucks are to be drawn up an incline by means of a chain and drum. The speed of the drum (and consequently the speed at which the trucks are to travel) is constant. Some of the trucks have wheels of 18in., and some of 9in. diameter. Then, query: Which trucks, the 18in. wheels or the 9in. wheels, will require the greater power to work, and what will be the proportionate difference of power required?—D.

[6378.]—**Cantilever.**—Supposing a cantilever A B of



any section is required to carry a certain weight at its free end, but is found to be only equal to half that load; of what assistance would a cantilever, C D, of same section and material as A B, be if placed under the same, and connected therewith by a vertical strut or column? Would it have the effect of doubling the strength of A B, as would be the case if placed alongside that cantilever directly under the load?—SEVERN.

[6379.]—**Papering New Walls.**—I am about to enlarge some rooms of a dwelling-house, and wish to paper on the new walls as soon as completed. Would rendering in Portland cement and sand, and setting with Keen's cement, enable me to do so? If not, what should be done?—X. Y. Z.

[6380.]—**Wood-Carving.**—Would any reader kindly inform me of the best elementary work published on wood-carving, and also the tools, &c., requisite for a beginner?—REBUS.

[6381.]—**Refinement and Neatness.**—I read with much interest the above article in your number of 21st Jan. I cannot make any of my friends agree with me that delicacy and refinement does not consist in uniformity of brickwork and imitation mortar-joints. As I feel sure that the writer of the above article can enter into the feeling and spirit of the past, I am going to ask a question, an answer to which from him would confer an obligation. I am interested in an old mansion, date 1586—probably the finest in the county—but now in a most miserable state of neglect. It has been illustrated in Nash, Hall, and other works of that nature. It is brickwork, with stone-work in windows, doors, and angles. The brickwork is very rough and uneven, there is no uniformity in the general size of the bricks, and the mortar joints are very thick and irregular. To cover all this, about eighty years ago, the whole front was coloured; the last time was about thirty years ago, and it is now partially peeling off. How can the colouring be removed without injuring the original face? I mean the face as existing eighty years ago. It will require watchful care and no hurry. To scrape it would look miserable in the days of Queen Victoria, though, as a new building, it was, no doubt, a fine piece of work in the days of Queen Elizabeth. I want it cleaned and the ancient tone retained. A builder suggested a removal of the outer case of bricks and neat work put in its place between the stone-work. Of course, I dismissed him.—O. H. M.

REPLIES.

[6359.]—**Mathematical.**—The numbers 15, 12, 9, give the ratio of the sides of a right-angled triangle, and from this we get angle (a) = 36° 52′; (b) = 53 8, or using the formula cos. $A = \frac{AC^2 + AB^2 - BC^2}{2AC \cdot AB} = \frac{12^2 + 15^2 - 9^2}{2 \cdot 12 \cdot 15} = \cdot 8000$, and from this we get cos. Q = 36° 52′. If "Spon's" tables give only a table of natural sines, we can find the cosine, knowing that the cosine of an angle = the sine of its complement.—H. S.

[6361.]—**Sewage Sludge.**—"J. B.'s" question can scarcely be answered satisfactorily in the compass of the usual space devoted to queries. The manurial value of sewage sludge depends upon the percentage of nitrogen and phosphoric acid (I omit the potash, which is present only in small quantities). When sludge is obtained by simple subsidence from untreated sewage water, it may, if the road surfaces of the town are paved, and if storm-water is excluded, contain from 2½ to 3 per cent. of nitrogen, and nearly as much phosphoric acid when brought to an absolutely dry state. But there are few towns where the "separate system" is rigidly enforced, and where the sewage water is clarified by simple subsidence. We get the sludge, therefore, diluted or admixed with from 50 to 75 per cent. of road detritus, and, where lime is used as a precipitant, the quality of the deposit is still further degraded by the added lime. Sludge which may cost from 25s. to 30s. per ton dry to desiccate has seldom a theoretical value beyond 12s. to 15s., so that "J. B." will not be likely to receive many applications for his mud-heaps. When sludge, obtained from the treatment of the sewage-water, with a plentiful mixture of lime, is dried and calcined, it yields, as Gen. Scott has pointed out, a very good cement. The sewage of the town of Burnley (population, 50,000) is now being thus dealt with at a profit. There is a ready sale for all the cement made (about 12 tons weekly), at 38s. per ton. Many hundreds of tons have been made and sold during the past twelve months. The material is now being chiefly employed by the engineer of the Lancashire and Yorkshire Railway Company for engineering works. For further particulars "J. B." should apply to the manager of the Burnley Sewage Works, Duckpits, Burnley.—G. REDGRAVE.

[6363.]—**Choir-Stalls.**—In reply to "V. M.'s" question on above, I think I may safely say that these are the only two examples in either England and Wales where the westernmost stalls on each side cant on plan towards the NE. and SE. angles of chancel respectively.—FRED. J. FREEMAN.

[6364.]—**Flitch and Truss Beam.**—Add 30 times the thickness of the iron flitch to three times the breadth of the wood, both in inches, and the result × by the square of the depth in inches, and divided by the length of the bearing in feet will give the breaking weight in cwts. at the middle, thus:—$(\frac{3}{4} \times 30 + 3 \times 9) \times \frac{51^2}{4^2} \div 24 = 335$ cwt. approx., and this ÷ by 10 gives the working load = 33·5 cwt; also taking into account that the beam is trussed, a safe load would be about 2 tons.—H. S., Belfast.

[6368.]—**Bricklayers' Charges.**—No.—F.

[6368.]—**Bricklayers' Charges.**—The bricklayer cannot charge for rebuilding cellar walls if he has entered into a positive contract to perform certain work, unless an intention is expressed to the contrary. If the flood was an unexpected accident, and the work was carefully performed, the law apportions the consequences: the bricklayer is liable, before its completion, and he will lose his remuneration, and the owner loses his part of the contract. The law does not bind a man to do what is impossible, but a contractor is liable to rebuild any part which may fall or be washed away before its completion, so as to fulfil his contract.—G. H. G.

[6371.]—**Stone Work.**—No.—F.

[6372.]—**Architects' Charges.**—Yes.—F.

A bust in marble of the late Mr. Thomas Bassey, the contractor, has been placed in the apse at the south-eastern angle of Chester Cathedral, by his three sons, who also subscribed the expense of the renovation and decoration of this portion of the building during the general restorations under the late Sir Gilbert Scott, as a memorial. The bust, which was executed by Mr. Wagmuller, stands upon a red sandstone pedestal. The local work was executed by Mr. W. Haswell, under the direction of Mr. E. Tarver, architect.

Mr. Frank Dicksee, painter, and Mr. William Hamo Thornycroft, sculptor, were elected Associates of the Royal Academy on Thursday in last week.

WATER SUPPLY AND SANITARY MATTERS.

HOVE EDGE, NEAR HALIFAX, MAIN SEWERAGE.—The Halifax Union Rural Sanitary Authority having been called upon to undertake the main sewerage of this village in consequence of the defective state of the present sewers, tenders have been obtained, and that of Mr. Benjamin Roberts, contractor, of Low Moor, accepted for the works, from plans prepared by Mr. T. L. Patchett, Halifax, under whose superintendence the contract is being carried out. Tanking for settling purposes is arranged in Mr. Henry Westwood's plantation, some 200ft. below the pinfold, where the sewage empties itself from 18in. glazed earthenware pipes. This size of sewer is carried forward up the road past the pinfold, and through Mr. Crossley's property, until it reaches the turnpike-road, at a depth of 12ft., so as to allow for the branches from basements of houses, &c. A manhole is formed here, and 15in. sewers run right and left along the turnpike road. Branch sewers, 12in. and 9in. in diameter, are also carried up Green-lane, and the other side-roads adjoining the main thoroughfare of the village. Junctions are to be left at convenient distances for taking up the branch drains, manholes and ventilators being provided where necessary.

LEGAL INTELLIGENCE.

ARCHITECTS' CRITICISM ON ARCHITECTS.—The inquest at Devonport, on the body of Timothy O'Leary, a labourer, killed by the fall of a rubble-wall at the public-hall in course of erection in Fore-street, in that borough, was resumed on Monday. Mr. Samuel Knight, F.R.I.B.A., of Cornhill, London, the architect of the hall, deposed that he was in no way hampered as to cost in drawing the plans, and that when he last visited the building, on Oct. 26th, the wall which had fallen was about 42ft. high. He believed that the wet weather which prevailed during the last three weeks of the year was the primary cause of the accident. Mr. F. W. Barr, clerk of works, said he had inspected the works from the commencement, in May last, and was in every way satisfied with the way in which they had been carried out. He attributed the fall of the wall to the wet weather, but had had no reason to anticipate such an occurrence. In the eight or ten days before the fall of the wall, it was raised by about 14ft. Thomas Gower, the foreman of works, deposed to the good character of the rubble materials used in the wall, and the contractor, Mr. James Matcham, of Plymouth, added that he had not been hurried, and that he could not account for the accident. Mr. James Hine, F.R.I.B.A., of Plymouth, expressed an opinion that in the erection of a wall of this thickness and height, and without cross-girders or buttresses, it was undesirable to build in rubble. He should have had more confidence in brickwork of like thickness, because in rubble-work there were no horizontal beds, and some inequality arose from the different workmanship of the men employed. He found that the wall was built with the best flat-bedded lime-stone and Aberthaw, and that it was better bonded even than specified. That it should, under such circumstances, have fallen showed some error in judgment in the design. Possibly, if the wall had been carried slowly in stages 3ft. or 4ft. in height, and every stage had been allowed time for consolidation, the large overhanging cornice would not of itself have brought the wall down; built as it was, the masonry was comparatively "green," and the overhanging mass was the last finishing touch. The coroner (Mr. Vaughan) intimated that he had thought it his duty, in the public interest, to obtain an architect of considerable eminence to afford him assistance on technical matters. He did not wish to confine independent evidence to Mr. Hine, and if Mr. Knight, or anyone interested in the matter, desired to call further evidence of that character, he would grant an adjournment. Mr. Knight asked for an adjournment, because the evidence of Mr. Hine was entirely at variance with his careful calculations as architect of the building. He felt that a serious responsibility had been put upon him. The Coroner said the opinion in his own mind was that Mr. Hine did not reflect upon Mr. Knight's professional reputation, but that his evidence simply amounted to an expression of opinion that it might perhaps have been better had the work been proceeded with more slowly. Mr. Knight: But he challenges the design. Mr. Hine: I simply say a brick wall would have been better and safer than a rubble wall. Mr. Knight said this was a charge of "error in judgment," which he could not allow to go unchallenged; and, in order that he might obtain other evidence as to his design, he must apply for an adjournment. The inquest was then adjourned till Feb. 15th.

IN RE G. BROWN.—This was a first sitting last week in the Court of Bankruptcy (before Mr. Registrar Murray), for the proof of debts and the appointment of a trustee. The bankrupt had carried on the business of a builder in Bedfont-terrace, Fulham, and his statement of affairs returned unsecured debts amounting to £2,200; fully secured debts, £8,600; and assets, £2,300. Proofs for nearly £2,000 were admitted, and the creditors appointed Mr. John Vale and Mr. Robert Gifford, accountants, as joint trustees, with a committee of inspection.

IN RE BATCH.—The debtor, Jacob P. Batch, who has present a petition for liquidation, is a pavior and contractor, carrying on business in Camberwell-road, and he is also described as late of Bucklersbury, Walbrook, and Bishopsgate-street. Mr. Ditton applied last week, with the concurrence of creditors, that Mr. James Waddell, accountant, who had already been appointed receiver, should be also empowered to act as manager of the business, which was of an extensive character. The liabilites were returned at £22,000, and it was anticipated that the assets, if advantageously realised, would be sufficient to pay the creditors in full. The debtor was engaged in several contracts, and the petition had been filed by the desire of the creditors in order that the property might be protected. Mr. Registrar Hazlitt granted the application, and an injunction was also allowed to restrain several actions.

TOBIN'S VENTILATING TUBES.—RUSTON v. TOBIN.—This was an appeal at Lincoln's Inn, before Lords Justices James, Brett, and Cotton, from a judgment of Vice-Chancellor Malins dismissing with costs an action by the plaintiffs to set aside an agreement for the sale to them of the defendant's patent, and granting the defendant the relief asked by his counter-claim for specific performance of the agreement. The hearing of the case before the Vice-Chancellor occupied 14 days in February last, several witnesses having been examined, and the defendant having been examined and cross-examined at great length. The object of the action was to set aside an agreement entered into in April, 1876, by the plaintiffs, who were ten in number, for the purchase from the defendant, Mr. Martin Tobin, of his patent rights for an invention of an "improved mode of ventilating rooms," on the alleged grounds that when the agreement was entered into the patent was utterly void and had been frequently infringed, and that in order to induce the plaintiffs to purchase his patent rights the defendant had made fraudulent representations knowing them to be untrue, and had also concealed important facts which he ought to have stated to the plaintiffs at the time when they entered into the contract. From the decision in favour of the defendant the plaintiffs now appealed. The case occupied several days, and on Tuesday last their Lordships unanimously upheld Vice-Chancellor Malins' judgment.

CHIPS.

A pulpit, handsomely carved in Caen stone, with marble and alabaster tastefully introduced, has just been presented to Brigstock Church by an influential parishioner. It was executed by Messrs. Jones and Willis, of London and Birmingham.

The annual dinner of the Warrington Branch of the National Association of Master Builders of Great Britain was held on Wednesday week, the chair being occupied by Mr. R. W. Collin (the president for the year), and the vice-chair by Alderman Chandley (the vice-president). About 40 gentlemen were present.

The annual report of the Bristol Cathedral Completion Fund has just been issued by the dean and chapter. It states that the total amount expended has been £4,200. During the past year the principal work has been to provide doors to the west porch, and to complete the carving within the new nave and on the west front. It is now proposed to remove the chapter-house from near the west end of the cathedral, so as to allow of the formation of a court before the west front. When that is accomplished, an effort will be made to raise the south-western tower to the same level as that at the north-west angle, which will cost about £500. The architect is Mr. G. E. Street, R.A.

A vicarage is about to be built at Ambleside, from the designs of Mr. J. W. Grundy, architect, of Ulverston.

A Rogett memorial infirmary is about to be added to the Royal Albert Idiot Asylum at Lancaster. Messrs. Paley and Austin, of that town, are the architects.

The presentation of prizes to students in the school of art and design at Lincoln took place last week, when a report was read stating that in the National Competition, one of the four silver medals for oil-paintings, and 20 third-grade prizes were gained, and at the Government examination, 6 prizes and 30 certificates were gained by 75 students. The Gibney studentship of £20 for two years had been awarded to Oswald Lloyd. It was stated that the bad accommodation and over-crowding of the school was telling injuriously on the evening tatendance of students.

Our Office Table.

MR. JOHN J. CRAIG, of Knoxville, Tennessee, says that the United States Government has recently opened, and is now working successfully, a quarry of white stone in the immediate vicinity of that city, which is pronounced by competent judges to be superior to anything of the kind found elsewhere in the United States. It is a highly crystallised limestone marble—and as it comes from the hammer or chisel is almost perfectly white; when polished it shows a faint pinkish blush; long exposure to the atmosphere seems to whiten and harden it, a sort of glass-like enamel forming over its surface and rendering it almost entirely impervious to dampness and stains of any kind. A column of this marble which has been standing in Knoxville more than thirty years, and which has never been touched with brush or soap, is as white and clean to-day as it was the day it was first exposed. The texture is neither too hard nor too soft, but allows the sculptor to work it without extra effort, and trace on it the finest lines of finished form, and yet hard enough to retain these lines in all their original delicacy. The quantity of the marble is said to be unlimited. Knoxville is surrounded by whole mountains of it.

ONE of the indications of reviving trade (says the London Correspondent of the *Manchester Guardian*) is to be seen in the result of the operations of the Land Committee of the Metropolitan Railway. In the year of briskest trade in the past decade—1873—the sales of the large quantity of surplus land that company possesses were to the amount of £100,241, but the amount fell off, and for 1879 the amount of the sales was only £5,900. Last year an official but unpublished return shows that they increased to £19,206—larger than any year since 1876. Concurrently the rents of property let have risen, and there are less arrears carried forward. It is evident that more persons are investing in land and property in London, and the movement carried on this year will yield a still larger return to the Metropolitan Railway.

A LECTURE on "Water Supply and Filtration" was delivered by Professor Corfield at the Parkes Museum of Hygiene, before members of metropolitan building societies, on Saturday afternoon. The relative advantages of hard and soft waters for domestic use were compared, the preference being given to soft water, especially on account of its economy of soap for washing; and the Porter, Porter-Clark, and Atkins modes of removing the lime from hard waters were described. The constant-supply was universally admitted to be better than an intermittent one, and pressure had been brought on the metropolitan companies to provide it; it diminished the risk of unmanageable outbreaks of fire, and reduced the amount of domestic waste. But it had its dangers, for when the supply was turned off for repairs there was a possibility that the contents of water-closets would be drawn in by suction, as happened at Croydon, with the result of typhoid fever outbreaks. For pipes and fittings lead was the best and most convenient material; and the danger of lead-poisoning was infinitesimal. It was probable that in the future iron pipes, protected by a well-worked application of Professor Barff's discovery, would be largely used. Passing on to the subject of filtration, the lecturer denounced as unsound in principle the common practice by water companies of taking their supplies from rivers and other admittedly-contaminated sources, and then endeavouring to filter them. The downward intermittent method was the best mode of filtration, as it aërated the water, and its action was gradual. The various kinds of filters were described, the use of sponge being condemned as uncleanly. The lecture was illustrated by numerous specimens of exhibits in the museum.

THE following letter is one of the 175 applications sent in to the Corporation of Barnsley for the appointment of Borough Surveyor, and its reading at Tuesday's meeting of the Barnsley Town Council excited great mirth:—"January 15, 1881. H—— W—— offers himself as candidate for Borough Surveyor of Barnsley—having had great experience as builder in cheap and jerry line, would know all tricks of jerry builders, and would see good property was put up in Barnsley. Jerry building in Sheffield now does not pay, so having made a bit would leave

it 2 accept post of Borough Surveyor of your important and rapidly increasing town, which I have visited several times, and the air of which agrees me, also with my wife and five children, youngest of which is 4 years old. I would give the whole of my time to the job, and would accept £200 until you discovered my great capabilities, when I am sure you would give me the full salary. I used to be clerk of works for building firm until I went into the jerry building line (cottage), and should have done very well, but Sheffield is overbuilt with jerry property. I will look after your important town well, and catch them, knowing their tricks. I can wait on you any day this next week if appointment be made, and will give you reference to people here. — Your humble servant, H—— W——."

As the recent experience of Plymouth might be that of any town to which water is conveyed from any distance, it is worth while to consider the inconvenience to which the inhabitants of that town have been subjected by the frost. It has been shown that a few degrees of frost will stop the water supply of a town, and the plain lessons of this emergency should not be overlooked. During the great drought of 1864, when the Bristol water supply was stopped for some weeks, the Local Board of Health erected pumps in various parts of the city, and these we believe have been allowed to remain, the handles in the mean time being removed. These pumps, scattered over the city, could, if required, be brought into immediate use, and constitute a second source of supply. Where no similar second supply exists, it might be possible to drive a few Abyssinian tubes in various districts and work them by steam-power. In a seaboard town like Plymouth, had the worst come to the worst, sea-water might have been condensed, and a partial supply thus obtained; but an inland town would have no such last resource to fall back on.

THE Sanitary Engineering and Ventilation Company, of Victoria-street, Westminster, have lately introduced a modification of their patent air-cleansing water-box in combination with a wall bracket for drawing-rooms and boudoirs, &c., which has many advantages. The bracket (which is designed either for a flat wall or a corner) is made large enough to carry a bust, a vase of flowers, or other ornament, behind which the current of purified air ascends vertically, and without damage to the ornament or to the decorations of the room. A valve is provided for controlling the supply, and the incoming air may be perfumed at will by putting a spoonful or two of scent in the water-box.

THE eminent American civil engineer, General Charles B. Stewart, died in Cleveland, Ohio, January 4th. General Stewart was engaged in the construction of the Philadelphia, Wilmington, and Baltimore Railroad, one of the first railroads in the country built for passenger service. Subsequently he constructed the Brooklyn dry docks, displaying therein an ability which secured his appointment as Engineer in Chief of the U.S. Navy. His volumes on naval architecture, the construction of dry docks, &c., attracted wide attention at home and abroad, and gained him much distinction at the hands of foreign authorities. He was for one term State engineer of New York, and deserves much of the credit for the first Niagara suspension-bridge.

ONE of Messrs. Barnard, Bishop, and Barnard's slow-combustion stoves, on exhibition at the Alexandra Palace, deserves notice, from the beautiful overmantel which surmounts it being made of the new wood, sequoia. The tree from which this wood is derived grows in the same forests and is closely allied to the *Sequoia gigantea*, popularly known as the Wellingtonia, one of the largest trees of the world. From the natural order *Cupressinæ*, to which it belongs, the most ancient examples of woodwork, recorded and extant, have been derived. On fallen trees of *S. gigantea* 1,500 annual layers have been counted, and Professor Asa Gray considers it probable that close to the heart of living trees may be found the circle that records the year of our Saviour's nativity. In the country of its growth the wood of *S. sempervirens*, applied to numerous purposes, is in high repute for durability below, upon, and above ground. Having the warm tone of cedar, without the overpowering odour of that wood, and a varied aspect, from plain linear forms to the most beautifully diverse figure, it is applicable to ornate work in ecclesiastical and domestic architecture, and is especially suitable for panelled interiors and furniture.

A VACANCY in the Royal Academy has been created by the death of Mr. Alfred Elmore, R.A., on Monday last. Mr. Elmore was 66 years old, having been born at Clonakilty, in the county of Cork, in the year 1815. He exhibited his first picture at the Academy so long ago as 1834. Two of his earliest pictures, "The Crucifixion," exhibited at the British Institution in 1838, and "The Martyrdom of Becket," which was on the walls of the Academy in 1839, are now in a Catholic church in Dublin. His greatest successes were won in his historical or semi-historical painting. The "Origin of the Guelph and Ghibelline Quarrel" (1844), his first important picture of this kind, was sold for £300, and gained him his entrance as an Associate into the Royal Academy. This was followed by the "Fainting of Hero" from *Much Ado about Nothing*, in 1846; "The Invention of the Stocking Loom," in 1874, a picture which achieved great popularity; "The Death-bed of Robert King of Naples, Wise and Good," in 1848; "Religious Controversy in the time of Louis XIV." in 1849, "Griselda" in 1850, and "Hotspur and the Fep" in 1851, among other pictures. Mr. Elmore was elected an Academician in 1877. His funeral takes place to-day at Kensal-green.

WE hear that it is proposed to hold another Exhibition of Fine Art in the Royal Albert Hall in May next, which will consist, as before, of works by British and foreign artists, architectural drawings, sculpture in marble or other material, terra-cotta, engravings, &c. All works intended for exhibition must be delivered at the Royal Albert Hall, free of all charges, including carriage, on the 22nd and 23rd of April, accompanied by a letter addressed to manager, describing the work as it is intended to be described in the catalogue. All paintings and drawings must be suitably framed; copies are not admissible. A committee of selection will be appointed, but artists are not restricted as to the number of works sent in. A commission of 7½ per cent. will be charged on all works sold.

Epps's Cocoa.—Grateful and Comforting.—"By a thorough knowledge of the natural laws which govern the operations of digestion and nutrition, and by a careful application of the fine properties of well-selected Cocoa, Mr. Epps has provided our breakfast tables with a delicately-flavoured beverage which may save us many doctors' bills. It is by the judicious use of such articles of diet that a constitution may be gradually built up until strong enough to resist every tendency to disease. Hundreds of subtle maladies are floating around us ready to attack wherever there is a weak point. We may escape many a fatal shaft by keeping ourselves well fortified with pure blood and a properly nourished frame."—*Civil Service Gazette*.—Sold only in Packets labelled—"JAMES EPPS and Co., Homœopathic Chemists, London."—Also makers of Epps's Chocolate Essence for afternoons

Lamplough's Pyretic Saline is refreshing, most agreeable, and the preventive of FEVERS, BILIOUSNESS, SMALL POX, SKIN DISEASES, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill. *Use no substitute* —[ADVT.]

Holloway's Ointment and **Pills** exercise priceless power over lumbago, all pains of the muscles, nerves, and joints, and quickly reduce all swellings caused by accidental injuries, weakness, or hereditary taints. The intelligible instructions enveloping Holloway's medicine give full counsel for using it most advantageously for regaining health, strength, and mobility.

CHIPS.

A fine-art loan exhibition is on view at Horncastle, including a large display of oil and water-colour pictures, china, ivory carvings, and cabinets of bijouterie.

At a local board meeting held at Luddenden-foot near Halifax, on Friday, Mr. S. Utley, C.E., of Halifax, was instructed to prepare plans for the rebuilding of the bridge over the river Calder.

At a meeting of the Acton Local Board, held on the 11th inst., Mr. Henry Monson was unanimously elected assistant-surveyor, out of 91 candidates for the office, at a salary of £150 per annum.

A new Primitive Methodist chapel was opened at Dunton Bassett on Sunday week. Mr. Wilson, of Huncote, was the builder.

Works of sewerage are about to be carried out for the Rugby rural sanitary authority in the villages of Long Lawford and Brinklow, at the estimated costs of £3,000 and £750 respectively. Mr. Parnall is the engineer.

The town-council of Denbigh held a special meeting last week to appoint a borough surveyor, when Mr. John Daives, who had just previously resigned his seat as a member of the council to become a candidate, was elected.

The new docks at Sutton Bridge, in the Wash, were completed last week after two years' labour, and a supper was given to the navvies in celebration of the event. Messrs. Benton and Woodiwiss, of Derby, were the contractors.

An inquiry was held at Scarborough on Friday, before Mr. Robert Morgan, C.E., an inspector of the Local Government Board, with reference to an application from the corporation for sanction to a loan of £15,850 for works of new sewerage rendered necessary by the rapid increase of the north-western district of the town, and for minor street improvements. The plans were explained by the borough surveyor.

At the late meeting of the Whitechapel district board of works, the death of Mr. S. W. Iron, for 10 years surveyor to the board, by a fall down the steps while entering his own house, was announced, and Major Munro, the representative at the Metropolitan Board of Works, in moving a vote of condolence with the family, expressed reprobation of the "indecent haste" with which a candidate for the appointment had sent out canvassing circulars.

MEETINGS FOR THE ENSUING WEEK.

SATURDAY (TO-MORROW.) — St. Paul's Ecclesiological Society. Annual meeting. 2 p.m.
Architectural Association. Visit to Standard Assurance Office, King William-street, E.C. 3 p.m.

MONDAY.—London Institution. "The Thing that Might Be." By Rev. Mark Pattison, B.D. 5 p.m.
Royal Institute of British Architects. "Persian Architecture and Construction." By C. P. Clarke. 8 p.m.

TUESDAY.—Institution of Civil Engineers. Discussion on "Deep Winning of Coal in South Wales." Paper on the "Portsmouth Dockyard Extension Works." By C. Colson. 8 p.m.
Society of Arts. "The Industrial Products of South Africa." By Sir Bartle Frere. 8 p.m.

WEDNESDAY.—Society of Arts. "Trade Prospects." By Stephen Bourne. 8 p.m.
British Archæological Association. "Exploration of the Roman Villa at Bromham." By W. H. Butcher, of Devizes. "Recent Excavations in the Troad." By Dr. J. S. Phene, F.S.A.

THURSDAY.—London Institution. "Three Years of Daily Weather Forecasting." By R. H. Scott, F.R.S. 7 p.m.
St. Paul's Ecclesiological Society. Annual Dinner.
Civil and Mechanical Engineers' Society. "Draining and Embanking with Regard to River Outfalls." By William C. Street. 7 p.m.

FRIDAY.—Architectural Association. "The Sanitary Work of an Engineer." By E. Turner. 7.30 p.m.
The Institution of Civil Engineers. "Boilers." By W. Marriott. 7 p.m.
Royal Institution. "Modern Spectroscopy." By Dr. Schuster. 9 p.m.

SATURDAY.—Parkes Museum of Hygieae. "Drainage." By Rogers Field. 3 p.m.

Doulting Freestone and Ham Hill Stone of best quality. Prices, delivered at any part of the United Kingdom, given on application to
CHARLES TRASK,
Norton-sub-Hamdon, Ilminster, Somerset.
—[ADVT.]

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SUMMER DRIED,
CORSHAM DOWN,
100,000 Feet Cube.
PICTOR & SONS, BOX, WILTS.
[ADVT.]

TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender—it adds to the value of the information.

BATLEY.—For villa residence at Batley. Mr. Walter Hanstock, architect, Batley:—

Mason:—		
Booth, J. and Son, Batley	£539	0 0
Joiner:—		
Jackson, G., Batley	250	0 0
Plumber:—		
Walshaw, J., Batley	85	12 6
Plasterers:—		
Morton, Bros., Batley	85	0 0
Slater:—		
Thornton, J., Heckmondwike ...	53	0 0
	£1,012	12 6

BELFAST.—For diversion of Blackstaff River, Belfast:

Stanford, J., Dublin	£34,469	7	0
Carlisle, R. and Co., Belfast ...	34,000	0	0
Fowkes, Bros.	32,610	0	0
McCrea and McFarland, Belfast	31,351	0	0
Relf, R. T., London	30,800	0	0
Doherty, W. J., Dublin	28,835	9	0
Monk, T.	27,000	0	0
Lowry, J. and Son, Belfast ...	26,500	0	0
Moffet, R. and Son, Paisley ...	25,550	0	0
McNelly and McKee	24,348	14	0
Dixon and Co., Belfast	23,000	0	0
Thompson, J., Belfast	23,380	0	0
Campbell, W. H., Belfast ...	23,374	0	0
Coghill, J. and Son, Inverness ...	23,000	0	0
Corry, R., Belfast	22,832	0	0
Dawson, F., Bury	22,500	0	0
Fitzpatrick, Bros., Belfast ...	21,000	0	0
Martin, H. & J., Belfast (accepted)	19,200	0	0

BRIGHTON.—For new roads and sewers on the Aldrington Estate, for E. Vaughan, Esq., and W. J. Williams, Esq. Mr. Chas. Jackson, surveyor:—

No. 3 road:—

Oliver (accepted)	£1,170	0	0

No. 20 road:—

Oliver (accepted)	900	0	0

CLERKENWELL, N. — For enlarging classroom for younger infants at Bowling Green-lane school, Clerkenwell, by 35 school places, for the London School Board:

Roberts, L. H. and R.	£212	0	0
Lawrence, E.	199	0	0
Pritchard, G. S.	189	0	0
Grover, J., New North-rd. (accepted)	187	0	0

GUILDFORD.—For making-up Park-road, at Stoke-next-Guildford, for the Guildford town council:—

Patrick, W.	£97	10	0
Gornett and Mills (accepted)... ...	75	0	0

HACKNEY.—For building model lodging-houses at Hackney, for Mr. B. Hyams. Mr. Edward Brown, architect, 18, Hanbury-street, Spitalfields:—

Uff	£8,743	0	0
Gould and Brand	8,284	0	0
Thomas and Barrett	7,850	14	9
Baldwin and Willcock	7,329	0	0
Gill	7,212	0	0
Marr, C.	6,890	0	0
Hawkins	6,852	0	0
Salt, S....	6,780	0	0
Jackson and Todd	6,755	5	0
Royal	6,720	0	0
Shurmur (accepted)	6,354	0	0

HAMMERSMITH.—For the enlargement of the school in Albion-road East, Hammersmith, by 400 places, for the London School Board. Mr. E. R. Robson, F.S.A., architect to the board:—

Booth and Sons	£4,185	0	0
Rankin, J.	4,097	0	0
Chappell, J. T.	4,006	0	0
Higgs and Hill	3,968	0	0
Hook and Oldrey	3,932	0	0
Harris and Wardrop	3,896	0	0
Chamberlen, Bros.	3,769	0	0
Tongue, W.	3,733	0	0
Grover, J.	3,696	0	0
Stimpson & Co., Brompton-road*	3,628	0	0

* Accepted.

[Cost of site (area 22,142 square feet), £2,312 8s. 5d.; cost of (*a*) school buildings only, including closets, £3,260; (*b*) tar pavement and playground, £88; (*c*) teachers' rooms, £200; (*d*) extra foundations, £80; total, £3,628. Cost per head of (*a*) and (*b*), £8 7s. 5d.; total cost per head, £9 1s. 5d.]

KILBURN.—For the erection of stabling, &c., for the London General Omnibus Co., at Mews-road, Kingsgate-road, Edgware-road, Kilburn. Mr. Alfred Tosh, architect. Quantities by Messrs. Bolton:—

Jackson and Graham	£4,735	0	0
Warr	4,395	0	0
Pryor	4,390	0	0
Ells	4,328	0	0
White	4,227	0	0
French...	4,121	0	0
Hayward	3,975	0	0
Higgs	3,899	0	0
Price and Richardson	3,877	0	0
Colter	3,854	0	0
Nicholls	3,825	0	0
Julian and Co.	3,788	0	0
Allen and Son	3,780	0	0
Richards and Munt...	3,732	0	0
Beele	3,692	0	0
Judd	3,595	0	0
Ward and Lamble	3,543	0	0
Russell and Cowley...	3,533	0	0
Parker...	3,477	0	0
Garrod	3,283	0	0
Vaughan	3,184	0	0

KING'S-CROSS, N.—For pulling down and rebuilding staircases and providing corridors at the York-road school, King's-cross, for the London School Board. Mr. E. R. Robson, F.S.A., architect to the board:—

Roberts, L. H. and R.	£1,598	0	0
Lawrence, E....	1,580	0	0
Pritchard, G. S.	1,490	0	0
Grover, J.	1,478	0	0
Williams and Son, Thornhill-sq., Islington (accepted)	1,424	0	0

LEWISHAM.—For erection of premises, Lewisham. Mr. George Vickery, architect:—

Conder, E.	£8,875	0	0
Brass	8,480	0	0
Colls	8,340	0	0
Ashby	8,246	0	0
Patrick	8,181	0	0
Lawrance	7,991	0	0
Nightingale	7,572	0	0
Jerrard	7,564	0	0

LEEDS.—For furnishing the new offices for the school board for Leeds:—

Gas pendants and fittings:—

Smith, C. and Son (accepted) ...	£230	0	0

Hinges, &c.:—

Smith, C. and Son (accepted) ...	100	0	0

Copper casements:—

Wilson, G. (accepted)	50	0	0

LONDON.—For alterations at "Market Tavern," Smithfield, E.C. Messrs. Alexander and Gibson, architects. No quantities:—

Bull and Cooper	£379	0	0
Watson and Dennett...	377	0	0
Dodds and Robb	359	0	0
Smythe	347	0	0
Spencer and Co...	345	0	0
Niblett	344	0	0
Cass and Belldon	340	0	0
Groame	325	0	0
Price and Richardson	315	0	0
Benson	297	0	0
Reed	295	0	0
Cranston...	278	0	0
Smith	276	0	0
Crouch and Tasker	275	0	0
King	270	0	0
Colter	267	0	0
Parker	261	0	0
Lorder	260	0	0
Radley	255	0	0

NEWINGTON-NEXT-HULL.—For the erection of schools in St. George's-road, for the Newington school board:—

Habbershaw and Sons	£4,356	14	0
Hockney and Liggins	4,290	0	0
Spence, A. and Co., York... ...	4,255	0	0
Brown, A.	4,215	13	0
Morrell, J.	4,206	7	0
Giles, T.	4,204	13	3
Wilson, Bros...	4,204	13	3
Berry, H.	4,140	0	0
Goates, T.	4,100	0	0
Sergeant, R.	4,035	0	0
Skinner, J. T. (accepted)... ...	3,948	0	0

NEWPORT PAGNELL.—For restoring (after fire) the "Swan Hotel," Newport Pagnell, Bucks. Messrs. Usher and Anthony, architects:—

Contract No. 1:—

Hull, Bedford	£657	0	0
Moore	610	0	0
Green and Hull, Wellingborough...	555	10	0
Edey and Son, St. Neot's	539	10	0
Mills, G., Newport Pagnell (accepted)	527	0	0

Contract No. 2:—

Mills, G., Newport Pagnell (accepted).

NEWPORT PAGNELL.—For cellarage at the Cannon Brewery, Newport Pagnell, for Messrs. Wilmer. Messss. Usher and Anthony, architects:—

Coverley	£210	13	0
Smith	160	0	0
George	155	0	0
Mills (accepted)	143	0	0

[Iron columns and girders are not included in the above contract.]

PECKHAM, S.E.—For new classrooms and lavatory extension at the school in Lower Park-road, Peckham, for the London School Board. Mr. E. R. Robson, F.S.A., architect to the board:—

Higgs and Hill...	£674	0	0
Lathey, Bros.	590	0	0
Downs, W., Hampton-street, Walworth (accepted)	574	0	0

PECKHAM, S.E.—For a cookery classroom at Sumner-road school, Peckham, for the London School Board:—

Tongue, Plumstead (accepted) ...	£240	0	0

POITON.—For two dwelling-houses and small farm-buildings at Potton, Beds., for Mr. W. T. E. Judd. Messrs. Usher and Anthony, architects:—

Haynes, Sandy...	£795	0	0
Gray, Gamlingay	739	17	0
Burnage, Potton	749	0	0
Rainsford, Potton	671	3	0
Peters, Gamlingay	664	0	0
Woodman, Potton (accepted) ...	637	0	0

STAMFORD.—For a new bridge over the Welland, to replace one swept away by the July flood, for the town council:—

For masonry:—

Cook and Bennett, Spalding ...	£878	15	0
Coates, W., Thrapston	504	0	0
Woolston, J., Stamford	449	0	0
Perkins, W., junr., Easton	447	0	0
Hinson, C., Stamford (accepted) ...	398	0	0

For ironwork:—

Nelson, J., Leeds	515	10	0
Ramadge, W., London	491	3	0
Wilson, Bros., Darlington	450	12	10
Butler, J., York	440	0	0
Bridge and Roofing Co., Darlaston	418	18	6
Richardson and Son, Leicester ...	418	0	6
Abbott, C. H., Stamford	404	5	0
Marwood and Co., Birmingham ...	387	17	3
Ashmore and White, Stockton-on-Tees...	382	0	0
Gimson and Co., Leicester	361	0	0
Pitts, M., Stanningley	330	0	0
Davis, Wolverhampton	311	0	0
Dawson and Llanelly, Leeds* ...	300	0	0

* Accepted.

TURNHAM GREEN.—For making up the main road at Turnham-green, from Gunnersbury railway-bridge to Goldhawk-road, Hammersmith, for the Chiswick improvement commissioners. Mr. H. O. Smith, surveyor:—

Mowlem, J., and Co. (accepted) ...	£1,250	0	0

WREXHAM.—For the construction of a new street from Regent-street to Watery-road, for the town council:—

Davies, Bros....	£1,088	19	8
Scott and Edwards, Chester ...	1,008	0	4
Hughes and Owen	966	2	8
Kirk, T., Chester	950	0	0
Davies, S. and Son, Wrexham* ...	896	0	0

* Accepted.

[Messrs. Davies and Son have since applied to withdraw their tender, on account of an error of £100.]

WIMBLEDON.—For building two houses at Raynes Park, Wimbledon, for Mr. Morrell. Mr. H. Shaw, architect. No quantities:—

Davis	£4,908	0	0
Jackson and Graham	4,435	0	0
Wood	4,176	0	0
Steel, Bros.	4,097	0	0
Price and Richardson	3,580	0	0
Garrod...	2,965	0	0
Holloway	2,860	0	0
Cass and Belldon	2,829	0	0
Parker...	2,638	0	0

YSTRADYFODWG.—For the improvement of roads in the Rhonddafach Valley, for the local board:—

Green, of Ferndale (accepted).

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THE BUILDING NEWS.

LONDON, FRIDAY, FEBRUARY 4, 1881.

THE MANAGERS OF METROPOLITAN BUILDING.

THE chief managers of Metropolitan building, under the various Acts passed to regulate it, are the Metropolitan Board, the Board's officials, and the district surveyors. The chief objects of the Acts are to insure safety from fire, security of construction, convenience for traffic, a certain amount of regularity in street frontages, and freedom from gross sanitary defects in buildings for public use or habitation. The intentions are excellent, and the regulations on the whole have done, doubtless, more good than harm. There is plenty of room for improvement, however, not only in themselves, but in the way in which they are carried out, and the BUILDING NEWS, being on this subject an independent journal, can speak freely and plainly both of the regulations and the regulators. Of the latter: the district surveyors are those with whom everybody who has to do with London building is most frequently concerned. Amongst their number are men of culture and ability, of whom we should wish to speak with all respect, even when we are compelled most fundamentally to differ from them. But along with them are also, unhappily, men of no culture, and no ability beyond the low and narrow capacity which, for the most part, is all that their routine business requires. An elementary knowledge of construction, a slight acquaintance with the strength of materials, and a close familiarity with the working of a few Acts of Parliament and the regulations appertaining to them, are found in practice to be a sufficient passport to the dignity and emolument of a district surveyor. The qualifications are so common, or so easily acquired, that it is no wonder the applicants are about fifty times as numerous as the offices. On what principle the selections are made it would be difficult to say; but they are not apparently influenced by high attainments or by professional reputation. Here and there, as we have said, these things have proved no hindrance to a district surveyorship, but it is doubtful if they have proved a help to it. The mechanical drudgery of the duties, too, has few attractions to a first-rate man; and while these duties remain what they are, the Metropolitan Board can hardly be blamed for not trying oftener to "cut blocks with a razor."

The misfortune is, however, that along with the want of high capacity is apt to go a certain want of refinement and consideration, which makes those who suffer from them unpleasant people to deal with; that the less respect they are personally entitled to, the more deference they frequently insist on when placed in office; that moral excellences do not always exist to compensate for intellectual failings; and that the conditions under which district surveyors work tend strongly to aggravate all these evils. The district surveyor is paid, not by a salary from any public fund, but by fees from the very men whose work he has to regulate. It is as if an architect, though appointed by his client, should be paid from first to last only by the contractor. The very danger which the Institute has so constantly and properly set its face against—the existence of a money relation of any sort between architects and the contractors who work under them—here shows itself in full force. In this fact there is such a plain and palpable opening for malpractices, that even were there, in no case, the least real ground for suspecting them, it would be impossible to keep out slander and suspicion. Supposing, however, that malpractices ever do exist, they must clearly be very difficult of detection. A little liberality in the calculations by which fees are decided—a little consideration for the surveyor's interest in agreeing as to which are or are not to be looked upon as separate buildings on the same site, will make matters pleasant without a resort to anything so indelicate as open bribery or corruption. On the other hand, it is nobody's business to inquire into the little advantages which the builder or building owner may get in return for these concessions. Further, it is not usually respectable contractors, but speculators of the lowest class, who chiefly want to evade the Building Acts, and the tendency—though, of course, we do not say the usual result—of the present system is to establish close relations between this lowest class and the district surveyor. The worst sort of building, therefore, is that which tends to be surveyed most leniently; while the best class, as we shall see directly, is not unfrequently visited with the utmost rigour of the law. For the district surveyor, unhappily for the public, is not confined to the duties of his office, though in many districts they would more than employ all his time and energy. He is allowed, in addition, to carry on a private practice, which may be a large one, and which, in many cases, has at least large results. His interest—and it will be remembered that we are speaking throughout of the natural interests under the present system, and not of the way in which honourable and high-minded men may rise above them—his interest is so to use his powers that no architect but himself can practise in his district without perpetual vexation, annoyance, and delay. The scamped house-building of third-rate streets is done without architects, and the district surveyor has no interest in making difficulties there; but in the best class of houses, and in public buildings almost without exception, architects are employed, and in dealing with these he has both the temptation to, and the opportunity for, gross unfairness. It is his interest—and experience points to the conclusion that in certain cases it is his aim—to shut all outsiders out of his district, and to engross as much as possible of its architectural practice himself. The powers entrusted to him may be twisted into admirable means towards this end. Public buildings in London have to be constructed to the satisfaction of the district surveyor—with power of appeal, if anyone thinks it worth while to make an appeal, to the Metropolitan Board of Works. The Metropolitan Board is only a magnified parish vestry, guided by the advice of a superintending architect, who is only a magnified district surveyor. We intend no disrespect to the present occupant of the office, but this is what it naturally makes of all who fill it. In practice, therefore, the power of appeal does not usually count for much, and we are thrown back on the district surveyor. When he deals with a public building, he can first find any number of faults with the proposed construction; he can next spend almost any amount of time in insisting on alterations and arguing about them; and, finally, he can cause the outlay of a large amount of money in effecting the alterations he insists on. Thus he can first discredit the intruding architect as a bad designer; then he can bring him into ill repute with his clients as a waster of time; and, lastly, he can make him notorious for running into an extravagant quantity of extras. We ought to add that he can wind up by appropriating in buildings of his own as many of the other architect's ideas as he cares about, since, by a recent regulation, he is entitled not merely to examine, but to keep, a complete set of the working drawings. With all these points in his favour, it is strange, indeed, if he does not often have an advantage over his competitors; and if cautious people in his district do not prefer to employ him personally, with the hope of saving both time and money. It is to the credit of district surveyors as a body that all this does not happen more conspicuously and frequently, but it is an intolerable disgrace to the system under which they work, that it should be possible for it to happen at all.

We may give an example, by no means imaginary, of the sort of way in which the present system *can* be worked, and of the class of men who *can* obtain and keep for many years the appointments in question. In a locality famed all over London for the badness of its low-class house-building, the public superintendence is done by two persons whom the scoffers of the neighbourhood have named "Pomp and Vanity." Mr. Pomp, an elderly man of vast pretentiousness, is the district surveyor; and Mr. Vanity, a younger person of infinite conceit, is his managing clerk. Intrinsically, Mr. Pomp differs little from a clerk of works of the old school, with his "Peter Nicholson," his "Builder's Jewel," and his indispensable bust of Michael Angelo. The only noticeable work he has ever done is to interfere with the work of other people; and if you are an architect, you would not admit him as a clerk into your office, even if he asked no salary. In the course of business, you send him the drawings for a public building to be erected in his district, and he makes an appointment to see you. Pomp sits in dignity in his arm-chair, and treats you as if you were a schoolboy come to say a lesson. Vanity stands behind him and prompts him, holding a list of objections and complaints numbered from 1 to perhaps 50. As each objection is read out, Pomp enlarges on the depravity which must have produced the thing objected to, and then turns up his head and looks at you out of one eye, like an intelligent jackdaw. If you defend your work, he offers you a hundred times over an appeal to the Board of Works, and threatens you every five minutes with a summons before the magistrate. It is of no use quoting principles or precedents; he tells you beforehand that nothing will convince him. Adopt his alterations you must, or oppose them before the Metropolitan Board. There is little benefit in appealing to a body with no technical knowledge of the questions at issue, or in exposing yourself in the process to more officialism, more pretentiousness, and more manners as graceful as those of Mr. Pomp himself. You agree to the alterations, in the hope of saving time, and in the despair of saving money, do what you will. Business settled, Mr. Pomp gives you a little paternal advice; criticises your style of drawing, and brings out as an admirable model for imitation, an inch-scale drawing of a kingpost roof. "This," he says, as he recalls to your memory the first labours of your articleship some thirty years ago, "this is the way in which you should learn to get out details; this shows the manner in which the true architect explains his designs." Perhaps, poor man, he does not really mean to insult you; to him a kingpost roof is the crown and flower of all construction; he could do nothing more original himself; he can imagine nothing more original done by others, and his idea of an architect is that of a man who spends his time in drawing neatly, what any carpenter can make without drawings at all.

The construction settled, you proceed with the work. You have a first-rate contractor, and the best materials that can be

bought for money. The structure, as it rises, looks, in comparison with the jerry-building of the neighbourhood, a marvel of firmness and solidity, but you are stopped at every step. There is not a clause or a regulation under which you do not get a complaint, a letter, or a threat; and though you may prove, nine times out of ten, that the clauses and regulations do not apply to the case in question, you have the trouble of correspondence and the annoyance of delay. The foreman cannot draw a brick from the wall or take up a board from the floor without a notice from Mr. Pomp, that the building is being rendered insecure, till at length some new intruder withdraws his attention from you, and you are left to build better or worse at your pleasure. In the mean time, at every visit to your building, you have watched with awe and interest the shops adjoining it. The walls are so weak, the supports are so thin, and so manifestly out of the upright, that you instinctively speak in a whisper as you pass them, like Alpine climbers who hold their breath for fear of bringing down an avalanche. If Mr. Pomp has been so hard to please about your own solid and substantial building, what imaginable means could have induced him to allow a ricketty house of cards like this? You delicately ask as much of the owner next time you see him, but he only answers, with a significant smile, "Mr. Pomp is a very nice gentleman." If you are wise, you inquire no further into mysteries that do not concern you. Your own treatment, after all, might have been worse. It is not worth naming, people tell you, in comparison with that which Mr. X. had to put up with. He and Mr. Pomp competed not very long since, for an important work in the latter gentleman's district, and Mr. X. gained the competition. It was a "public building," and Mr. X. had to submit the drawings to Mr. Pomp for his approval; a succesful competitor compelled to ask a beaten competitor for his approval of the design which had beaten him! Language cannot adequately paint the situation, and we should in vain try to describe, even if we fully knew, all Mr. Pomp's endeavours to find expedients equal to the case. We leave the details to the moralist or the satirist who wishes, for once, to make an exhaustive study of the meanest side of human nature.

We repeat, again, that we have not described Mr. Pomp as an average specimen of the London district surveyor. But we also repeat that it is a public disgrace that it should be possible for any specimen such as this to occupy such an office, and that there is something radically wrong about the system which permits it. More than this, there is something yet more grossly wrong about the system which tends to make men into this type, which tempts them, if it does not persuade them, to wink at bad building and raise frivolous objections to the good; to neglect public interests, and gratify private exclusiveness, not to mention private spite. Let district surveyors, by all means, be well paid; but by no means let them be paid by the very men they are appointed to watch over. Let them continue, if no better plan can be found, to inspect and decide in the first instance on the construction of public buildings; but let their whole time be devoted to official duties, and not to the keeping of their districts as close preserves for their private practice. Let such scandals as that of a defeated competitor, revenging himself by the help of his official position on a successful one, cease at once and for ever; and let there be a real appeal from every district surveyor's decision to an able, impartial, and thoroughly unconnected tribunal. Lastly, if it is not too much to ask, let not only some few, as at present, but let every manager of Metropolitan building make an effort, in his transactions with other architects, to conduct himself like a gentleman dealing with gentlemen. Art, we have long ago heard, softens men's manners and renders them less savage. If there is any truth in the assertion, it is painful to think what the manners of some Building Act officials might have been had they adopted a career that brought them into no relations with the artistic.

THE NEWBURY GRAMMAR-SCHOOL COMPETITION.

No less than 58 sets of drawings have been received for the Newbury grammar-school, and these have been exhibited during the last week on screens in the large room in the Town-hall, Newbury. As was intimated in the particulars furnished to competitors by the secretary, the trustees have availed themselves of the advice of Mr. Waterhouse, and that gentleman has made known the result of his labours to the trustees, having awarded the design with motto "Industria Omnia Patent," by Messrs. Power and Hughes, of Leadenhall Chambers, the first place, and the design with motto "Collegiate," by Mr. C. H. M. Mileham, of Gower-street, London, the second premium. A glance at the plans shows a general agreement as to the position of the chief divisions of the building, which had to comprise a school-room to accommodate 200 boys, with three class-rooms and conveniences; a dining-hall to seat 80, with kitchen offices to answer also the purposes of the head-master; dormitories for 40, and master's residence. It was also necessary to bear in mind the provision for future extension. We find, in the large number of plans, a front building facing the Enborne-road, with two or more buildings in the form of cross wings. In many plans the schoolroom has been placed on the east side, and is made to form a return-block, with the class-rooms and dining-hall in the front building, and the master's house on the west side, and there are undoubted advantages in this location as regards lighting and aspect; but in some designs this arrangement has been reversed. Either end is suitable for the house, and some very good plans show it at the east side. A few plans are based on the quadrangle. It is, however, of fundamental importance that the assistant-master's room should occupy a central position, so as to command a view of the school, dormitories, and playgrounds, that the class-rooms should be near to the school, and the dining-hall to the kitchen, and that the entrances should be convenient, and close to the cloak-rooms and lavatories. Further, it is required that the boarders and their rooms should be arranged as much as possible so as not to encroach on the day-scholars' quarters; that the master's house should be self-contained and easily separated; and that the rooms and corridors should be spacious, well ventilated, and lighted. In many of the plans we find the main corridor connecting the school with the class-rooms, dining-hall, and house, is placed on the inner side, which has the effect of preventing a cross-ventilation through the main rooms and dormitories, and in some cases it is made excessively long, without sufficient light in parts that should be well-lighted; while, in others, space has been wasted in useless passages. The stairs should be centrally placed, and near the main entrance, and this has been adhered to in most of the plans.

As regards architectural treatment, the designs are various, though it is pretty evident that the intention of asking Mr. Waterhouse to advise has influenced a large number of the competitors to adopt the Gothic which is most in favour with him, and, perhaps, for scholastic buildings of this kind, the Tudor or Domestic Gothic buildings of the 16th century supply very suitable models. A few Queen Anne and Classic designs are, however, seen, though many of these appear to indulge in expensive features. Of suitable Renaissance we find scarcely one good example, and the best designs in the present instance are in Late Gothic. Many of the drawings exhibit a large amount of skill and study in their preparation; one or two we noticed have rather exceeded the instruction as regards colour.

We can only afford space to notice in detail the chief designs. Beginning with "Industria Omnia Patent" (by Messrs. Power and Hughes), we have no hesitation in at once admitting it to be a well-planned and economical design, bearing indications of study. The authors have placed their building to face the north or Enborne-road, leaving in the rear a large area as a cricket-ground, and giving to the head-master's house a south-western aspect, a disposition which seems favourable, and one suited to the level and site. The design is shown by an ink perspective sketch. Late or 16th century Gothic, of English character, has been adopted, and the front, which will occupy a commanding position, consists of a central entrance, carried up three stories, and finished as a gable, a gabled school on the east side forming a wing at right angles to the front, and the master's house the corresponding side. The features are plain, and the grouping and details bear a scholastic character, while the three main divisions of school, class-rooms, and residence have been kept in view, and made distinctive features in both the plan and design. The fronts are of red brick, with stone or terra-cotta dressings. As in many other plans, the usual disposition of buildings has been adopted; a range of building with two cross wings, or ⊔ shaped. The school, which forms the east wing, and is only a one-story building, is 65ft. by 27ft., and its height to the springing of roof is 16ft. It is well lighted by side-windows on the east, and by two end windows of Perpendicular character. The main longitudinal corridor, which connects the school with the other portion of the building, forms a good entrance, and communicates with two class-rooms in front, while a back corridor, running at the side of school, forms an entrance into the playground, and gives access to another class-room, which is built out behind. It would have been better to have reversed the arrangement of this part by putting the day-scholars' hat-room and lavatory where the class-room is, near the back entrance. The class-rooms are convenient in position: they are each 20ft. 6in. by 18ft. 6in., have long desks to accommodate forty boys, and are well lighted by wide windows to the left of the pupils. The dining-hall forms a corresponding wing on the west side of the entrance, and measures 40ft. by 18ft. 6in., with a bay-window in front, capable of seating 90 boys. It is in convenient proximity to the kitchen offices of the master's house, and the service arrangements, the china and store closets have been considered. Near the centre entrance, and commanding the corridor, is a sitting-room for the under-master, and opposite the entrance, forming a projection behind, is the main stairs, with a lavatory and w.c. below it, well ventilated and communicating with a covered playground for the use of the boarders. In the house arrangement, the kitchen is well placed, not only near dining-hall, but master's room; but perhaps the latrines and covered playground would have been better if placed on the other side instead of being so close to the domestic offices, and the library-door put in a more retired position. On the first floor are the dormitories. One, 34ft. by 24ft., divided into 12 cubicles, is placed at the school end,

and two others 41ft. 6in. by 18ft. 6in., occupy nearly the entire floor along the main-front, each comprising 14 beds, or over 600 cubic feet per boy. The assistant-master's room is placed between these, commanding the dormitories, and the lavatories are also central, opening into each of them. Bath-rooms and w.c.'s are over those below, and occupy the upper landing. The housemaid's closet is well placed; the corridors are 5ft. wide and well lighted, and the authors show openings for light and air on the inner side of dormitories. These are obtained over the roof of corridor, and furnish, with the front windows cross ventilation. Generally, we find the details fairly worked out; hollow walls are proposed, the closets and soil-pipes have external positions, and the heating and ventilation have been considered. Boyd's stoves are provided to supplement the open fireplaces. The estimated cost is £7,000, the school and class-rooms, dining-hall, &c., being calculated at 6d. a cubic foot, the dormitories at 5d., and the master's house at 7d.

"Collegiate" (by C. H. M. Mileham) is certainly less satisfactory, though its author has correct notions of school-planning, and is one of the architects who occasionally takes the place of the architect to the Privy Council on Education, and to the Charity Commissioners, according to the description accompanying the design. The pencil sketch shows a very plain, thoroughly domestic, treatment in Late Gothic. The squat entrance-tower and cupola, and grouping, the open-timbered covered play-shed, and the details have an almost picturesque homeliness about them, and not very much to put one in mind of a modern collegiate establishment, and the author has clearly taken one of the old types of English buildings for a guide. In plan the tower forms a bold-arched gateway or entrance; on one side are the school and class-rooms forming a compact block of building, entered from the gateway, and having a corridor between the school and the three class-rooms. The school, lighted from the front, is 52ft. by 20ft., and has three ranges of seats for 40 boys each; the hat-and-cloak room forms a lobby entrance on one side, and the class-rooms are planned on an approved model close to the school-room and well lighted, with angle fireplaces. We much doubt whether the school-room is quite large enough for assembly purposes. On the left of entrance is a dining-hall 33ft. by 20ft. for 80 boys, with a bay window, a servery conveniently placed, and lastly the master's house forming the end of the range, the offices extending in the rear and making a long wing terminated by a wash-house and laundry. Behind the school block is a covered playground and a fives-court; the staircase forms a semi-octangular projection near the entrance, and the assistant-master is well placed. The first floor plan is less satisfactory; the house and dormitories strike us as drawn out to an inconvenient length, and the position of assistant master's bedroom would hardly afford him the supervision he ought to have over the two dormitories which are placed at right angles over the school end. The partitions of wood dividing them are not desirable, and the lavatories and bath-rooms look cramped. The dormitory with 12 cubicles is well placed on the other side of the master's room, and the store-room is central. We should have thought one nursery sufficient and a little more lavatory space useful. In the house arrangement, economy has been considered in the kitchen and serving to dining-hall; but the offices at the back make an unnecessarily long wing, and the planning of reception-rooms is not satisfactory. We prefer the site plan, No. 2. The estimate is £7,022.

We intend to illustrate both these designs. "Newbury" is shown by a large ink perspective. It is a Gothic design, broadly treated, with pleasing grouping, and some good detail in the elevations; but the author rather exceeds the requirements in the plan, which forms a quadrangle, with open centre court and corridors round. The residence, dining-hall, class-rooms, and playground form respectively the four sides; but the schoolroom is too long, and is over the classrooms, a decided objection. "Postulata," by Mr. J. H. Money, of Newbury, is a boldly drawn ink design in Late Gothic, rather modernised in treatment. The main objection to the plan is the length of schoolroom, which is 110ft. by 24ft. It forms a single-story wing; the house forming the other. The intervening building in front has the classrooms and an inner corridor, which connects the school and house. "Falkland" is a striking set of drawings in an expensive palatial style, calling to mind the Elizabethan front of Wollaton House, which apparently served as a model, and there are few good points in the plan, which is broken up by bays in a rather profuse fashion. "Utilitas" is a clever pencil-sketch in outline, with a touch of French Gothic, freely handled, having a lofty double-stage spire over entrance. The plan lacks economical distribution of parts, which are put together in a random kind of manner; but the chief defects are the position of the classrooms and lavatories: the former are too far from the school, and the latter from the entrances. "Experientia" (we are told the design of Messrs. Giles and Gough) has many good points. The main building, drawn in a Late Gothic style, is shown with three stories. A florid centre entrance, finished as a gable, has some good French detail about it, though expensive. The main front block is occupied by a dining-hall and classrooms, and the school forms a wing in the rear. In the plan, the position of kitchen with respect to the dining-hall and masters' rooms, have been considered; and there is much in this part of the plan which is like that of the design placed first. The corridor is rather long. "Compass and Square" in circle, is another clever well-drawn Gothic design, but costly; the dining-hall is made a prominent central feature, and there is a long centre corridor, but the school is long, and is cut off from classrooms by lavatories, and the main offices are straggling.

"I Strive to Win" (we believe by Mr. Webb, of Reading), is the motto of a creditable set of drawings. The author seems to have worked out the conditions of the plan with care; the school, class-rooms, and domestic offices are all in good positions, the isolated sick-ward is a desirable arrangement, and the least satisfactory parts are the want of continuity in the corridors, and their lighting, and the length of school-room. No less than five designs have been submitted for the elevations; these are treated in Gothic, Queen Anne, and Old English. The elevation in brown ink in a Late Gothic style, with dormers, and another, "L. S. D.," in a picturesque 17th-century style of Domestic character, display decided taste. We hear that this design was favourably considered by the Committee. "Experto Crede" is a Queen Anne design; the brickwork is relieved by bands, there are dormer gables along front; the arrangement lacks compactness in the domestic offices, though there are good points, as the lavatories, the division of the boarders, &c. The school forms a lengthened front. The alternative plan is the best. "Oxford and Cambridge" (Gothic), shown by a neat perspective, shaded in Indian ink, is remarkable for the small windows; in other respects, there are creditable points, though the plan is indifferent. "Manners Makyth the Man" is an able design in Queen Anne showing some picturesque handling but wanting in coherency. There is the London School Board ring about the front, a series of dormers cut it up, and the treatment of flat arches in the end gable windows looks weak and hard. The plan is too costly. Why two large schoolrooms 48ft. by 22ft. each? These form the facade, and the dining-hall is made to connect the house, which is behind, with the school. "School," in a 15th-century French Flamboyant style, is the motto of a clever set of elevations, lightly relieved by sepia-washes in roofs and windows. There is some spirited and piquant detail, but we are constrained to remark the unsuitableness and expense of the style for the purpose intended. The plan is not satisfactory. Near are hung two striking designs under the motto "Study," though apparently by different hands. One of them is in a Queen Anne style, with timber framing in parts, pleasing in detail but wanting in rhythm and character; the other is in a more monumental collegiate Gothic style, but the plans are less satisfactory. One of them has a long, ill-lighted corridor, and both fail to carry out the conditions of a school residence. "Design with Beauty, Plan with Care," is the motto of a competitor who evidently has worked out his design under a sense of the truth conveyed in the above maxim. The Gothic is of a more sensible and moderate kind than many others, and the chief faults are in plan the great length of school-room and the large area occupied by the buildings. Some good features are to be seen also in "Nota Bene," who sends a bold pencil perspective in Domestic Gothic; but the porch and oriel window of the house has an awkward squatness. The elevations are well drawn, but the plan scattered. "Druid," Gothic, a well-treated elevation, simple and broad in effect, makes the dining-hall a centre feature, and puts the offices in the rear. The school is made a projecting wing. "Multum in Parvo" is better in plan, with a bold tower entrance. "1881," in a mixed style, semi-Classic with some half-timbering in the gables, is a clever design, exhibiting artistic feeling and shown by a neat perspective of suitable character.

We must pass in rapid review a few other designs, many exhibiting great labour and skill in preparation. "To Be or Not To Be" is in a monumental Gothic style, with centre tower and a half-timbered house; the elevations are well drawn, but the plan incoherent. "'Twas in the Prime of Summer Time," &c., is picturesque in the parts; the end wings advance from the front, and bold Gothic and Jacobean features are blended, but the planning and lighting are imperfect. "One Lives and Learns," in a mixed, rather undistinguishable style, half Italian, half Queen Anne, has too straggling a plan, and the school and class-rooms are poorly arranged. "Propria Quæ Maribus," is too confused in plan though picturesque in elevation, French Gothic in character, and shown by a cleverly drawn perspective. "Licet Mihi Appelere" has some good points in plan, but we question the tradesmen's entrance being put where it is; the dining-room and servery are well planned, but the scheme lacks simplicity. Three alternative designs are shown, one in Queen Anne. No. 2 is a quadrangular arrangement but too irregular to make it desirable. "Plan" has a clever ink perspective in a Domestic Gothic. "Spes," "Enter these Portals," "Woodstock," "Dulce Domum" in circle, "A Outrance," "Progress," "Mens sana in Corpore sano," "England," "Pelican," "Experience," "Education," "Syntax," "Newbury," "Rien sans Dieu," "Agamemnon," "I.C," "Detur Digniori," "Architect," "Quilibet," "Spes," are a few others of which we cannot speak.

The requirements of warming and ventilation have, we find, not been lost sight of by some of the competitors, and, other things being equal, the trustees ought to take these

questions into consideration. It is important that the heat required in the school and class-rooms should be utilised in warming the dormitories over by flues in connection with the heating-chambers or stoves, and we find the author of one premiated design has provided for such utilisation, and that Boyd's stoves, in conjunction with the fire-places and coils in window-recesses, have been specified. Extracting flues and air-pump ventilators are shown in many of the designs, and in an establishment of this kind it would be possible to make the smoke-flues not only useful in warming, but in causing up-draught for the escape of foul air. Not less necessary is the demand for good drainage : the soil and waste-pipes should be placed outside, and not only be trapped but disconnected; and provision might be made for the storage of the rain-water as indicated in some of the plans. Cost has been exceeded by many of the competitors, and some ridiculously low figures per foot cube are made the bases of estimates. Mr. Waterhouse's decision, we may add, will be subject to the approval of the Charity Commissioners, and we may express the regret that a wider selection was not made.

THE LATE MR. B. J. TALBERT.

WE regret to announce the death of Mr. Bruce James Talbert, which event took place at his residence, 5, Euston-square, on Friday evening last. In him we have lost one of our best decorative designers, and many of our readers will feel that they have lost a kind and genial friend.

Mr. Talbert, whose decease has taken place at the early age of 43, has made a name, as a designer of furniture, which has not been equalled in England since the days of Chippendale and Adams. He commenced his working life with a wood-carver in Dundee, and afterwards acted as an assistant in the office of an architect in that town. Leaving Dundee, he went to the office of Mr. W. N. Tait, in Glasgow, and then to Mr. Campbell Douglas, in company with Mr. J. J. Stevenson and Mr. Sellars. Mr. Talbert was conspicuous in Glasgow for his talent as a draughtsman, and he here made the acquaintance (an acquaintance which ripened into a happy friendship when they met some years afterwards in London) of some other young architects and artists, who, like Mr. Talbert, have made a somewhat prominent figure in the art world.

Subsequently he worked largely in designing metal work for Messrs. Skidmore and Co., of Coventry, and while there was engaged to elaborate and work into detail the designs of the late Sir Gilbert Scott for the metal-work of the Albert Memorial. Mr. Talbert's first engagement in London was with the old firm of Messrs. Holland and Sons, of Mount-street, Grosvenor-square, who executed some of his earlier furniture designs. After this, he was employed chiefly by Messrs. Jackson and Graham, for whom he designed many of the principal decorative objects exhibited by that firm in the various international exhibitions both at home and abroad. Leaving this house, he entered practice in Gower-street on his own account, and settled down to the class of work by which he has made his name so well known, and his influence so widely felt. The Gothic school had no more enthusiastic and earnest worker than Mr. Talbert, and the publication in 1867 of his first great work, "Gothic Forms; applied to Furniture, and other Decorations for Domestic Purposes," brought him to the front rank as a designer of furniture, a position he continued to improve, and an influence which he extended to the end of his life.

Though devoted more especially to furniture, his ability as an architect was of a high order, as those who remember his design for the Manchester Town-hall—one of the three selected—will admit. In 1876 Mr. Talbert published a second volume of "Furniture and Decorative Designs," which publication, like his work already alluded to, met with considerable success both in England as well as America, where Mr. Talbert's designs found many admirers and copyists, especially his earlier productions, which were almost entirely Mediæval in character and ornate in detail. The designs which he recently prepared were more than often based upon Jacobean models, a style which he, perhaps, made more decidedly his own than any other, though much of his work depended upon simple natural forms. His life was a generous and unassuming one, and he was ever ready to assist others. By his death the Hogarth Club loses one of its most sociable and prominent members. He was at one time a constant contributor to the pages of the Building News, nearly all his Royal Academy drawings having been published in our pages. Mr. Talbert also designed the Building News heading, which, it will be remembered, was chosen in an open competition by Prof. Donaldson, who acted as referee.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE seventh ordinary meeting of the present session of the Institute was held on Monday evening, the President, Mr. J. Whichcord, F.S.A., in the chair. The Secretary announced the recent deaths of two honorary and corresponding members, Mariette Bey, of the Boulak Museum, at Cairo, and Professor Martin Gropias, of Berlin. The hon. secretary stated that six candidates had offered themselves for the Pugin Travelling Studentship, viz.: E. J. Milner Allen, of High-bank, Fulham, S.W.; F. W. Booker, Cromwell-terrace, Cromwell-street, Nottingham; A. Hemingway, 103, Heaver-street, Battersea, S.W.; Francis Hooper, Elmleigh, Hayne-road, Beckenham; W. R. Lethaby, 20, Calthorpe-street, W.C; and Jas. Andrew Minty, 16, Marshall-street, Edinburgh. After carefully considering all the drawings, the council had elected Mr. Lethaby to be the Pugin student for 1881. An exhibition of the drawings by all the candidates would be held during the week commencing Monday next, Feb. 7th. Mr. R. P. Spiers remarked that the successful candidate gained the Soane Medallion in 1879.

PERSIAN ARCHITECTURE AND CONSTRUCTION.

A paper, written by Professor T. Hayter Lewis, who is now in Egypt, from materials furnished by Mr. Caspar Purdon Clarke, now travelling through India, was read for the joint authors by the Secretary. It commenced with the following introductory passage :—The objects of art, with most of the drawings which illustrate this paper, were lent to me (Professor Lewis) by Mr. Caspar Purdon Clarke, who for some two years was employed by Her Majesty's Government as resident architect to the British Embassy in Persia, and who is now in India on a mission from the authorities of the South Kensington Museum. To him I also owe many valuable suggestions respecting theories of the formation and influence of Persian and other Eastern Art. I am afraid that to many of the members the subject will not have much interest, for it may seem to be but remotely connected with our present work. To me, however, the study has served as a relaxation from the hard work of ordinary professional life, as it appears to show the source of the new and grand outlines practised by the Byzantines—outlines which, in various styles, are now homely forms to us. The dome, for example, not springing timidly, as may be said even of the great Pantheon of the Romans, from a circular base, built solidly up from the ground, but raised high in the air, on four great arches, whose angles were gathered up into pendentives to form a base, high above, for the dome which was to cover all. To Persia, too, whether under its various conquerors or its native race, we owe, so far as I can gather, that singular form of pendentive, the honeycomb—one of the most distinctive features of Arab art—and many, if not most, of the beautiful ornaments of tile work, incised marbles, and other refined decorations, which give so great a charm to Byzantine and Arab work. Through Byzantium, Egypt, Spain and Venice, Persian art deeply influenced Mediæval work in Italy, Germany and France; and not until the rise of pure French and English Pointed architecture did this influence pass away. It affected us again in later times. When we look upon the dome of St. Paul's Cathedral, when we consider the decoration best fitted for it, and envy perhaps the skill of Sir Christopher Wren, it will be well to remember that, some 1300 years ago, the same form was built up in a bolder way, and its surface was decorated by the Byzantines in a manner which we are only now trying to imitate; and that these same Byzantines worked, so far as I can learn, after the hints supplied to them by the Persians. The paper treated of the unique character of Persian history, Persia being the only one existing of the ancient great monarchies. Nearly all the accurate knowledge possessed of it, derived from personal investigation, was due to Sir R. K. Porter, Texier, Flandin, and Coste, with such memoranda from residents in Persia (but without the assistance of drawings) as were given by Major Smith and others. The valuable essays which Mr. Fergusson had written, partly from those materials, were well known. According to him, no hiatus in architectural history was more complete than that of Central Asia during the ten centuries which elapsed from Alexander to Mahomet. A map, showing by various tints the boundaries of the Persian Kingdom at different times and under different dominations, was exhibited, and a reference was made to a letter, but little noticed, of the historian, Niebuhr, who, long before the discoveries of Botta and Layard, prophesied that the time would come when those who lived after him would find on the Tigris and the Euphrates the origin of Grecian art and mythology. The drawings of Persepolis, forming part of the University College series, were exhibited and referred to; also a drawing, from the same series, of the Tomb of Cyrus, which bore evidence of Grecian art—a fact to be explained by the constant communication of the Greeks through the Ionian Colonies with Persia. That much Greek influence was at work there before the conquests of Alexander was probable, and his conquests were not mere invasions. Alexander built cities in conquered countries, and peopled them mostly with Greeks. Two such cities were built on the farthest limits of his dominion, some 150 miles north of Moultan, near the scene, in our own times, of the Battle of Chillianwallah; also one near Cabul, another near Candahar, two others on the Indus, and one near the modern Merv. The details of Indian work from the time of Asoka, some 70 years after Alexander's death to the later times of the Amravati Tope, about the fourth century of our era, showed Greek influence. Analogies between the details of carvings at Persepolis and at the Sanchi Tope were referred to. Illustrations of the same were exhibited. The paper continued with references to the dominion of the Greeks in Asia; the revolt of Bactria and Parthia; the new Bactrian monarchs, who were also Greeks, and who ruled until B.C. 120, in Cabul and Western India; the Indo-Scythian kingdom; colony founded by Trajan at Nineveh; the ruins at El Jerash (the ancient Gerasa) in the almost uninhabited land of Moab; Sassanian rule in Persia, Syria, and Egypt; the reproduction of ancient Persian forms at Ferozabad and Serbistan, &c.; the Persian plan still worked on in the Saracenic works of Syria, Egypt, and Sicily, as well as in the great commercial route from Alexandria northward to the South of France. Whether the Byzantine pendentives came from Persia it was impossible to say, but the mode of lighting domes, as at St. Sophia, was undoubtedly due to the Persians. References were made to the over-running of the Persian native empire (the Sassanians) by the Arabs, whose capital was established at Baghdad; to Mahmoud of Ghazni; to the invasions of the Mongols or Moghuls; to Timour or Tamelane; to Moghul architecture in Persia and North-Western India. The paper then touched upon the actual mode of planning and building houses in Persia, a mode which had been in use for centuries; and with regard to which Professor Lewis said :—The drawings which Mr.

Clarke has supplied, and which I take as my text, are the ground-plan and sections of a Persian house built about 1650. It has the open court, which answers in some measure to the Roman atrium, though the disposition of the whole plan is unlike the Roman. Roughly speaking, it consists of a long open court with rooms on the two longer sides. The entrance is at the end of the rooms next the road, through a small but very pretty octagonal hall, somewhat unusual in plan and with a peculiarly groined roof, the design being described to me as like that of Beejapore, which was illustrated in the Institute *Transactions* by Mr. Fergusson. Out of this hall you turn sharply to the left into a passage which leads sideways into the court. By this sudden turn, the privacy of the house is quite protected, an object which I am sure ought to be borne in mind more than it is in our own plans. In the centre of the court, which is paved with square tiles, is a square sinking for water and its fountain. On the side opposite to the entrance are two rooms and a kitchen. There is an upper story over some of the rooms, but in general they are ceiled only by the roof. In planning such a house, the Persian architects use paper which is ruled crossways in faint lines—paper similar to that used in France and Germany by architects, and in this country by engineers—the divisions representing the ordinary thickness of the walls. To speak broadly, the architect has only to draw his brush through these squares, and the workman knows just what is wanted. I need scarcely say that this method of working gives a sort of rhythmical proportion to the different rooms, and it materially assists in continuing the rectangular system of planning which has so especially characterised Eastern art from Egypt and Assyria downwards. At the same time, the exquisitely beautiful manner in which, in the East, the square form is often gradually brought into the octagonal or round, by almost imperceptible degrees, takes off the unpicturesque appearance which these plans would otherwise have. To get to the upper-story, the stairs are formed in a way which seems to be likely to lead to accidents. The steps are all planned as winders, not ascended as ours would be—round a cylinder—but winding very little, each step being made just large enough to take one foot, so that the stairs can only be ascended and descended one way, and that way not a very safe one to an unpractised climber. A sketch, by Mr. Clarke, of part of the stairs of the house, the plan of which I give, illustrates this peculiar mode. I now come to the ornamental work. The surfaces, much raised, are executed in plaster, possibly stamped but never cast. The plaster when being mixed with water is beaten up, so as to prevent its crystallising, and is at the same time mixed with a decoction of madder-root or with sugar. The plaster thus treated will not harden for several days, and in order to make this paper as practical as possible, I have had this method tried by an experienced plasterer. The result may be seen in some twisted specimens which I exhibit, and which did not set for several days, though without the treatment I have described they would have been quite hard in a few minutes. By retaining the plaster in this moist state, the plasterers are able to work all the ornaments by hand with great facility on the spot; and much in fact as the Italian band of plasterers who came over here at the building of Queen Anne's churches, when such beautiful work as that at St. Martin's-in-the-Fields was executed by them by hand. In a Persian living-room the chief object of decoration is the fireplace, the opening of which rises higher than in our own fireplaces. The fuel used is wood, composed of long logs set up on end on the hearth. A flue leads like ours to a chimney top, often prettily ornamented. Next in point of decoration are the windows, formed in plaster-work of beautiful patterns, the chief being that of a slender central stalk branching out into delicate conventional forms. The effect is, of course, that of a screen keeping out the fierce rays of the sun, and when filled with coloured glass, like the specimens exhibited, producing a most beautiful effect. The doors are equally ornamental, and are made of small pieces of wood. Professor Lewis concluded with a reference to some of the forms of Persian decorative work, expressing Mr. Clarke's opinion that they were derived from the Tartar or Chinese—perhaps from Tartar-Chinese art—notably the bulbous dome. The Professor, having referred to objects of Persian work at South Kensington, exhibited some specimens of ornament, and some drawings lent to him by Mr. Clarke; and he closed his paper with the following paragraph:—I may say that Persia, invaded, conquered, desolated, in the hands of strange masters for centuries at a time, still shows, in the words of Major Smith, that "Persian art, from the earliest times until the present day, has retained a distinctive characteristic style," and I will venture to say that in it are to be found outlines, colouring, and decorative work which have formed the bases of many of the most beautiful architectural forms handed down to us by the Byzantines and the Arabs.

Mr. James Fergusson, F.R.S., said the paper they had just heard was of a very interesting character, and one of a class too seldom heard in that room. It was to be regretted that Prof. Lewis had dealt with so wide—too wide—an interval of time and ground, that adequate criticism was impossible in one evening. The peculiarity of Persia was, that it was never one country—never inhabited by a single homogeneous race of people. Indeed, it was the site of the dwellings of the three races of men whom the Bible described as the descendants of Shem, Ham, and Japhet. The perplexity introduced by the interminglings and overlappings of peoples was so great that no one could distinctly follow the shufflings of the cards. The architecture was similarly complicated, so that no reliance could be placed on any theoretical sequence of styles. The Greeks left some traces of their presence; the Parthians also, to a smaller extent; the Sassanians more; but perhaps the Persian modes of building grew with a large addition of Arab element, and an admixture of the Mogul influence. These combinations of foreign influences, as puzzling as they are unsatisfactory, were illustrated in the plans and elevations which were exhibited on the walls. He differed from Mr. Purdon Clarke in his condemnation of the influence of the Moguls. All the most beautiful buildings, not only of Samarcand and other Persian towns, but of many parts of India, were the work of Timour the Tartar, and to the Moguls the decorative use of colours was due. The Palace of Mashita was a remarkable structure, well worthy of careful study. It was built about 610, and apparently by Byzantine architects, for it stood on a distinctly Corinthian base, and was everywhere ornamented with the acanthus-leaf. It had been thought that the Saracens based the style they used in Spain on a certain amount of Christian art, mingled with Turanian ideas. In this palace was to be seen a good example of the pendentive dome—later, of course, than that of St. Sophia. Prof. Lewis had spoken as if the pendentive dome was invented in Persia. He could not positively say it was not; but his own opinion was that the whole series of domes was to be traced in Christian lands between the simple idea of a domical cover, as worked in the Pantheon at Rome, and the use of pendentives at St. Sophia, Constantinople. He did not think that the Western architects obtained any help in their conceptions from the East; the invention of the dome was, he believed, a Byzantine, and not a Persian, idea. The author had spoken of the Oriental domes as exceedingly intricate in plan; but when he was at the Crystal Palace with the late Joseph Bonomi during the building of the Alhambra court, he noticed that the workmen used a number of triangular, round, and other simple forms of pieces of plaster, and fastened them together by little notches as easily as one would build a brick wall. The result was pretty, ingenious; but not grand or dignified.

Mr. Crace called attention to some drawings and a plan of a 17th-century house at Bagdad, which he described as a very pretty example of Saracenic architecture, having some Persian peculiarities. He stated that the Palestine Exploration Committee were about to undertake explorations on the east of the Jordan, a district which had been little disturbed since it was laid in ruins, and which was expected to yield much interesting information which would bear on Persian architecture of the Roman period. Prof. Lewis had stated that the Persian tiles ceased to be made in the 17th century, but he believed, from the inquiries he made at Damascus, that the art had not died out at the close of last century. It was hopeless to attempt to trace a direct sequence between the art of ancient Persia and the almost purely Saracenic art which exists in Persia at the present day.

Mr. William Simpson referred to the somewhat analogous architecture he had examined in the Jellalabad Valley and in Delhi, describing in detail the mosque of Kila Kona, and the old fort in the latter city, which he considered the finest domed building in India, or indeed in the East. The pierced windows, of which an example hung on the wall, were common in the East, and were used for ventilation and to keep out animals; in India they were carved in marble; in Kashmere and at Cairo they were of wood, but he had never before heard of plaster ones.

Mr. R. Phene Spiers observed that considerable stress was laid in the paper on the originality of the Persians, not only in decoration but also in construction, although he had not heard sufficient proof advanced as to the latter point. They had been told that the great pendentive dome was derived from Persia, but he had heard no reason to doubt Mr. Fergusson's theory that the dome was developed by Byzantine builders, and nothing more than a pendentive-roof had been illustrated from Persian sources. It seemed that the stalactite or honeycomb vaulting, of the intricacy of which so much had been said, was built up of a number of simple forms, and it was evident that the later examples were much more complicated than the early ones. The pierced windows of the East, it should be remembered, were placed so high up in a lantern that only the reflection of the light transmitted by the stained-glass was cast upon the whitened walls, and in that climate this afforded sufficient light in the rooms.

Mr. G. Aitchison, B.A., referred to the very large and valuable collection of Persian masons' trade-books and plans, illustrating the architecture and decorations of that country, which Mr. C. P. Clarke had secured for the South Kensington Museum during his mission in that land, of which only a small portion were exhibited that evening, and stated that so thoroughly were the principles of the art understood that Mr. Clarke took a plan and section of an elaborate cornice in one town, and gave the drawings to a workman at Teheran, who from them made an exact reproduction on the British Embassy premises in the latter city. The pendentive domes were built up of inlays of wood, cut to the required shapes on the ground, set up, and covered with plaster. The house at the Paris Exhibition of 1878, erected by the Shah of Persia, was executed in this manner. The pierced windows, referred to by Mr. Spiers, were not always set so high in the walls as he had said; they were seen directly in the lower rooms when the glass with which they were filled glittered like jewels.

The President, in closing the discussion, expressed his gratification at the announcement made by Mr. Crace as to the proposed explorations in Eastern Palestine, and proposed a vote of thanks to the author of the paper that had been read. At the next meeting of the Institute, to be held on Feb. 14, the discussion on "Sanitary science" would be resumed.

THE NATIONAL BUILDERS' ASSOCIATION.

The National Association of Master Builders of Great Britain held their sixth half-yearly meeting at the Palatine Hotel, Manchester, on the 26th ult, when the following towns were represented—namely, London, Liverpool, Manchester, Salford, Lancaster, Wolverhampton, Bradford, Northampton, Lincoln, Leeds, Warrington, Wigan, Birmingham, Sheffield, Huddersfield, Portsmouth, Doncaster, Edinburgh, Dundee, Rochdale, Crewe, Macclesfield, Bolton, Kidderminster, Stalybridge, St. Helens, Hull, Oldham, and Meltham. The report of the Council and the accounts for the last half-year were adopted and directed to be circulated. The National Association of Master Painters of Scotland, which has affiliated itself to the National Association of Master Builder of Great Britain, was represented at the meeting. The following gentlemen were elected as officers for the ensuing year—namely, Mr. Stanley G. Bird (London), president; Mr. W. H. Cowlin (Bristol), and Mr. Robert Neill, jun. (Manchester), vice-presidents; and Mr. Edward Hughes (Liverpool), treasurer. Mr. Thomas Clay (Manchester), the late president, who was

compelled to retire through ill-health, was elected an honorary vice-president, and great regret was expressed at his enforced retirement. It was decided to increase the number of gentlemen forming the Council from 21 to 25, and representatives from Edinburgh, Bolton, Hull, Sheffield, and Portsmouth were elected members. It was also decided, on the invitation of Mr. Stanley G. Bird, to hold the next half-yearly meeting in London. The question of extending the Association was considered, and this was recommended to the consideration of local associations, who were requested to take the matter up in their respective neighbourhoods, with the view of increasing the number of local associations. The question of the liability of employers under the Employers' Liability for Injuries Act was considered, and after some discussion, during which several schemes of insurance were submitted by the Sub-committee appointed for that purpose, it was decided to refer the question to them for further consideration, and to bring the matter to maturity at the earliest possible date. After the meeting the members of the Council and other gentlemen from local associations in the immediate neighbourhood were entertained at a banquet by the members of the Manchester and Salford Builders' Association.

PLYMOUTH DOCKYARD EXTENSION WORKS.

AT the meeting of the Institution of Civil Engineers, on Tuesday, Mr. Abernethy, F.R.S.E., President, in the chair, the paper read was on the "Portsmouth Dockyard Extension Works," by Mr. Charles Colson, Assoc. M.Inst.C.E.

These works were on the north side of the island of Portsea, somewhat to the east of the old dockyard. The area inclosed was about 180 acres, of which 95 acres had been reclaimed from the mud lands of the harbour. The works were designed by Colonel Sir. A. Clarke, K.C.M.G., C.B., R.E., Assoc.Inst.C.E., and were carried out under the superintendence of Mr. H. Wood, M.Inst.C.E., Mr. J. Macdonnell, and the author.

Before the works could be commenced it was necessary to inclose the site. This was done by constructing a shallow dam on the highest part of the mud, and an outer dam inclosing the harbour wall. The inner dam was completed in October, 1868, and 1,200ft. of the outer dam were closed at the same time. The additional water area or basin accommodation consisted of the tidal basin, 9 acres in area, with a depth of 43ft. 6in. at H.W.O.S.T., and 30ft. at L.W.O.S.T., and about 1,600ft. of wharfage; the repairing basin, having an area of 21 acres, and 34ft. 10in. in depth at H.W.O.S.T., and 21ft. 4in. at L.W.O.S.T.; the rigging and fitting basins, each having an area of 1½ acres, with 34ft. 10in. depth of water at H.W.O.S.T., and 21ft. 4in. at L.W.O.S.T.; the wharfage accommodation in the three latter basins was equal to about 8,200ft. The whole of the works were constructed in Portland cement, more than 100,000 tons having been used.

The retaining walls for the basin and harbour wharves varied in sectional area according to the position and depth from the level of the coping. The tidal basin wall was 48ft. 10in. in height, and the width at the base was 22ft. 6in., diminishing to 6ft. at the top. The harbour wall was 44ft. 6in. high by 20ft. wide at the base, and the basin walls were 38ft. 6in. high and 16ft. wide at the base. The materials used were brick and concrete, with Portland stone for facing at the top, and granite coping. The foundations were laid upon piles ordinarily spaced 5ft. and 4ft. apart from centre to centre The size of the piles varied from 11in. to 15in. in diameter, and their length from 14ft. to 19ft. for beech and 20ft. to 30ft. for fir; transverse and longitudinal sleepers were fitted over the pile heads; on the outside was a continuous row of sheet piling. The pile shoes were of a composite character, the plug being of cast-iron, with wrought-iron straps; all the piles, with the exception of the back row, were driven to the same batter as the wall, viz., 1 in 8. The toes of the walls were protected by a concrete foreshore about 10ft. wide.

The docks contemplated were five in number; of these only three had been constructed, viz., two communicating with the repairing basin, and the deep dock, which was entered from the tidal basin. The entrances only of the two others had been constructed, the docks being left for future consideration. The foundation of one of the docks on the south side of the repairing basin was partly on the London clay and partly on the sandy beds below, and was constructed of beech piles from 14ft. to 16ft. in length, spaced generally 5ft. by 4ft. apart, except near the head, where the lines of piles were altered to suit the curve. Considerable difficulty was at times experienced in driving these piles, in consequence of meeting with isolated beds of stone. When these stones were near the excavation level they were removed, and the pile was driven in its proper position, and the hole filled with cement. The foundations for the broad altar, and all works above, were also on piles, but at a higher level than the foundation for the floors and lower altars. The spaces between the sleepers on the top of the piles, and to a depth of 2ft. 6in. from the top, were filled with Portland cement concrete. The floor was constructed of Portland stone and granite, and was 7ft. 6in. thick. The length from within the entrance to the broad altar at the head was 410ft.; the width between the copings was 110ft., and mean depth 42ft. The entrance to this dock was constructed for an ordinary ship caisson; the width between the copings was 80ft., and the depth of water at H.W.O.S.T., 38ft. 6in. The other dock was parallel with the one just described; the width of the wharf between the two being 100ft. The foundation of this dock was somewhat different, as the piling at a higher level for the broad altar was omitted, and the excavation was continued to the same level as the foundation of the floor of the dock. The length of the floor from the inside of the entrance to the broad altar at the head was 406ft. 6in., and the mean depth 42ft. 3in. The entrance was constructed for a ship caisson, and was 82ft. wide at the level of the coping; the depth of water at H.W.O.S.T. was 33ft. 10in. The culverts for filling and emptying both these docks were arranged on each side of the entrance. The two docks yet to be constructed would also be on the south side of the repairing basin. The piling in the foundations of the entrances had been omitted, the sheet piles only being retained. The deep dock on the east side of the tidal basin was so designed that ships could enter at low water of spring tides. In the foundations, the ground having proved more satisfactory than had been anticipated, the piles were omitted, and an extra depth of concrete substituted. The total length of the floor of this dock, from the inner face of the entrance to the back of the recess at the head, was 415ft., and the mean depth 46ft. 8in. The culvert for emptying this dock was 7ft. in diameter. The entrance was 82ft. wide at the level of the coping, and the depth of water at high and low water of spring tides 41ft. 6in. and 28ft. respectively.

The north and south locks were abreast, to the north of the deep dock, and formed with the tidal basin the grand entrance to the system of docks and basins constituting the extension of the dockyard. The length of the floor inside the entrances was 438ft. and the width at the level of the coping 100ft. The west entrance of the deep dock and lock was closed by a sliding caisson, which could be hauled into a chamber by engines and gear placed in chambers beneath the roadways. The depth of water over the sills of these entrances was such that ships could enter at low water. The east entrance was closed by a ship caisson, and had the same depth of water as the other docks.

All the docks and basins were drained by a 7ft. culvert, communicating with the two main pump wells. These were situated at the south-west corner of the repairing basin, and were 55ft. 6in. deep below the level of the coping. All the sluices were of cast iron, faced with gun-metal, and the arrangement of the machinery was such that the valves could be raised either by hand or by shafts and gearing in connection with the capstan or caisson engines. Each penstock was provided with an arrangement for throwing the clutch out of gear by the action of the valve, when it was either completely raised or lowered. The whole of the penstocks, capstans, and sliding caissons were worked by compressed air. The main pumps were on the plunger principle, with plungers 6ft. in diameter and of 6ft. stroke, constructed by Messrs. James Watt and Company, of Birmingham. In the smaller drainage-chamber of the well there were three single-acting pumps, each 16in. in diameter, and having a stroke of 2ft. 6in. The engines for working these small drainage-pumps were of the ordinary type, having two inverted vertical cylinders, 16in. in diameter, and 2ft. length of stroke. The main pumping-engines were of the compound type, with two inverted cylinders, the high pressure being 40in. and the low pressure 64in. in diameter. These pumps were capable of clearing two of the largest docks, containing together about 90,000 tons of water, in about four hours.

THE STANDARD INSURANCE COMPANY'S NEW PREMISES.

SOME time ago we alluded to the new offices of the Standard Insurance Company, King William-street, E.C., as a building possessing the merit of departing from the commonplace type of Classic buildings, and we drew attention to the bold treatment of the basement and mezzanine, forming as they do a lofty substructure adorned with red Aberdeen granite pilasters, and to the Greek feeling of the ornamentation generally. Last Saturday afternoon the members of the Architectural Association paid their first visit to this building, and were conducted over the several offices and departments; the plans and working details being fully explained to them. The architects, Messrs. Boulnois and Warner, had a narrow and awkwardly shaped site to adapt running at the north end to an acute angle, which has been utilised by one of the two main stone staircases. On the ground-floor, at the south corner, is a public office, of ungainly form (an irregular pentagon), partaking of the shape of the ground, and measuring about 44ft. by 36ft. in its longest dimensions. It is paved with Minton's tiles, laid to a pleasing Greek pattern. Adjoining is another large office. The public office is fitted up as a bank, with manager's room, desks, counters, &c., &c. We notice that the dado, doors, architraves, and partitions are executed in mahogany. One column, encased in Scagliola, by Messrs. Bellman and Ivey, supports a long girder or beam in the plaster ceiling; but beyond this, there is little that is decorative to call for remark. Ascending the stone stairs, we arrive on the first floor. Here there is a board-room above the public office, lighted by three large windows with mahogany sashes and architraves, the lower sashes are lofty, and divided by vertical bars to represent French casements; there is a mahogany dado, panelled; a parquet border to the floor, and the doors and cornices are executed in mahogany. Lavatories and conveniences are obtained in the rear. The other rooms on this floor comprise a secretary's office, medical officer's room, and a large office on the north side, to be let. The second, third, and fourth floors are also arranged for offices and chambers in connection with the insurance business, or will be let. The basement is very commodious; the old vaults have been faced with white enamelled bricks, and have been converted into a series of well lighted and ventilated urinals and w.c.'s, light being obtained by Hamilton's prismatic pavement lights. There is also a high-pressure hot-water apparatus, an hydraulic lift, and commodious strong-rooms and safes, the latter fitted up by Messrs. Chubb and Sons. The heating apparatus and electric bells have been supplied by Messrs. Land and Co., of Stratford-by-Bow; the tilework dado to the staircases, by Mr. White, of Gresham-chambers; and the tile floor of public office by Messrs. Minton and Co. We may add that the works have been carried out in a thoroughly excellent manner by the contractors, Messrs. Perry and Co., and reflect credit on the various tradesmen employed. The stone-carving to the façade has been executed by Mr. Kelsey in a praiseworthy manner, and with a true feeling for Greek. The polished red granite pilasters of the basement have cast-iron stanchions behind them which carry the Corinthian columns and superstructure of the main façade, and the floors are all of rolled joists and concrete. The whole of the work has been under the superintendence of Mr. W. Stanley, clerk of works. The architects have kindly promised their drawings of the building, which we hope to illustrate at an early date.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—On Saturday afternoon last (Jan. 29) a visit was made to the new Science College in Edmund-street. There was a large attendance of members, including Messrs. T. H. Mansell, R. B. Morgan, T. F. Proud, A. Clere, J. P. Osborne, Fred. G. Hughes (hon. sec.), Messrs. E. Wood, and W. H. Kendrick, of West Bromwich; Messrs. H. H. McConnal, F. E. F. Bailey, and J. Ellis, of Walsall, &c. Mr. J. A. Cossins, the architect of the building, met and conducted the party.

LEEDS ARCHITECTURAL ASSOCIATION.—A meeting of this association was held on Thursday week, Mr. S. E. Smith in the chair. A memorial to the Royal Institute of British Architects was adopted, requesting them to require all Fellows to be elected from the ranks of the Associates, who in the future will be required to pass an examination. A paper entitled "An Apology for Perishable Construction," was read by Mr. D. Brade, of Kendal.

LEICESTER SOCIETY OF ARCHITECTS. — On Thursday evening, the 27th Jan. last, this society held a *conversazione* in the Museum Lecture Hall and School of Art, which was attended by nearly five hundred guests, among whom were the Mayor of Leicester, Alderman Kempson, Alderman Stevenson, Alderman Barfoot, Mr. Millican, and other members of the Town Council; Mr. W. S. Hobson, Mr. George Hodges, Mr. Frank Hodges, Mr. J. D. Linton, Mr. Orrock, Mr. G. T. Robinson, Mr. H. W. Lonsdale, Mr. R. Phené Spiers, Mr. Ordish, Mr. Shenton, Mr. Burgess, and others. These guests were received by Mr. Joseph Goddard, the President, in the great hall, where a very large collection of works of art had been collected. These were lent by collectors and connoisseurs in the town, and by some of the principal manufacturers in London. Among the drawings were several fine examples by David Cox, De Wint, Cattermole, J. D. Linton, J. Orrock, J. Fulleylove, Harry Ward, R. Phené Spiers, and T. Langham; a large study in pencil, by John Ruskin, of the West Doorway of Rouen cathedral, and several sepia drawings of Old Leicester, by the late Mr. Flower. Messrs. Trollope and Sons sent some fine pieces of old tapestry and modern furniture and faience, collected by Mr. G. T. Robinson from various manufactories throughout Europe. The Ladies' Work Society, 31, Sloane-street, sent specimens of embroidery and art needlework, among which were three or four pieces designed and worked by H.R.H. Princess Louise, president of the society, and a series of decorative china plaques were contributed by Miss Spiers. In the rooms of the School of Art Messrs. Collinson and Lock, Messrs. Richardson and Ellson, and Messrs. Gillow, of London; Messrs. Noble, Cort and Paull, and Elgood Brothers, of Leicester; and Messrs. Smith and Sons, of Birmingham, were all represented. Messrs. Heaton, Butler, and Bayne contributed cartoons for stained-glass drawn by Mr. Holliday and Mr. Shields, and Mr. H. W. Lonsdale sent the cartoons for glass of St. James', Croydon. In the museum buildings were Japanese drawings and embroidery lent by Mr. Cutler, and Persian carpets and embroidery by Dr. Dresser. So important a collection of works of art and art manufacture has rarely before been brought together for such a purpose, and it reflects the greatest credit on the energy and industry of the president and committee. In the conservatory, where a band of music played during the evening, were several designs by the architects of Leicester. On the following day Mr. Goddard entertained the principal guests and architects of the town at a luncheon in the Assembly Rooms, and it was arranged that a portion of the collection, viz., the water-colour drawings in the great hall, should be opened to the public till the following Tuesday.

SCHOOLS OF ART.

EDINBURGH.—The prizes gained in the year 1879-80 by students of the School of Art were distributed last week. The number of students under instruction in the School of Art during the year 1879-80 was 841. The awards obtained from the Science and Art Department, in the national competition, are:—Male School.—1 gold medal, being the third year in succession that this prize has been gained by the school; 3 silver medals, 5 bronze medals, 12 Queen's prizes (books.) Female School.—3 bronze medals and 2 Queen's prizes (books.)

HALIFAX.—The annual distribution of prizes in connection with the Halifax School of Art took place on Wednesday week. Mr. W. H. Stopford, the head-master, was unable to be present to read his report, for the first time since his appointment, having broken his leg by a fall in the street; but he wrote that the ladies' and evening classes had been unusually well attended, and 300 more works had been sent to South Kensington for examination than in any previous year. For a carpet design, J. W. Riley had taken a National bronze medal, the Owen Jones' bronze medal, and a book prize; and seven other Queen's prizes were gained. The second-grade examination, held in April, was the most successful ever held, and resulted in 54 passes, including 15 marked excellent. The report of the sketching class spoke also of an increase in numbers and an improvement in character of work.

WOLVERHAMPTON.—The annual meeting and distribution of prizes in connection with this school took place on Thursday, the 20th ult. The report showed that during the year 163 students attended the classes, an increase of fourteen on the previous year. Sixty-three students were examined in May, and obtained one prize and 15 certificates in art, and three Queen's prizes and twenty certificates in science subjects. At the National Competition seven third-grade and one book-prize were gained. Towards removing the building-debt of £1,600 (which has been a burden for twenty-five years), donations equal to one-half had been promised. Mr. J. H. Chamberlain, of Birmingham, then delivered an address on "Some of the Uses of a Knowledge of Art."

PARLIAMENTARY NOTES.

SUNDAY OPENING OF SOUTH KENSINGTON MUSEUM.—Last week Mr. A. Grey asked the Vice-President of the Council if the privilege of members of Parliament to enter the South Kensington Museum on Sunday afternoons could be restored. —Mr. Mundella could not find any minute relating to the existence of such a privilege. He thought the House would agree with him that if the South Kensington Museum was to be opened on Sunday at all it should be opened to the general public, and if it were to be closed it should be closed altogether.

THE TEMPLE BAR MEMORIAL.—Mr. Labouchere asked the First Commissioners of Works last week, whether it was his intention to take steps to remove an obstruction consisting of a griffin elevated above two statues representing her Majesty and the Prince of Wales, which had been erected opposite to the New Law Courts in the centre of a public highway.—Mr. S. Lefevre: Sir, the Corporation of London claim, and I believe have always exercised, an exclusive right and jurisdiction over the streets within the City, and the erection of any monuments there, and I have no intention of contesting their claim. I am further precluded from raising any question as to the obstruction caused by the Temple Bar Memorial by the fact that my predecessor most reluctantly gave facilities for a widening of the road rendered necessary by its erection. In order to prevent a much greater inconvenience to the public by the narrowing of the roadway, Mr. Adam felt himself compelled to resell to the City a strip of land, so as to add to the road to the extent to which it was to be diminished by the Memorial. The necessary effect of this was to reduce the footway in front of a portion of the new Courts of Justice by about five feet. The design for the Memorial was not submitted for the approval of Mr. Adam, nor was he in any way responsible for it. I think every one must admit, now that Memorial is completed, that a great mistake has been made; that it is very unfortunately placed; that the reduction of the footway in front of the Courts of Justice will be most inconvenient to the public; and that the Memorial itself is artistically unworthy of the site. I cannot but express my hope that the Corporation of London, which has always shown so much interest in questions of taste and public convenience, will defer to the general opinion of the public on the subject. I believe the best course would be to remove the main portion of the Memorial, which has some merits, to a point not far distant, where the road is much wider, and on re-erecting it there not to replace the griffin. I have communicated in this sense unofficially with the authorities of the City. I am unable, however, to say at present whether they will take any action. The matter rests entirely in their hands. I can only say that I shall be glad to co-operate, on behalf of the Office of Works, in removing any difficulties which may exist to such a course.

DECORATION OF THE HOUSE OF COMMONS.—Mr. Schreiber on Monday asked the First Commissioner of Works whether he intended to proceed with the mural decoration of the Central Hall of the House of Commons.—Mr. Shaw Lefevre: The question as to the best mode of filling the vacant panels in the Central Hall has been the subject of difficulty and doubt since 1871, when a committee of artists advised against proceeding further with mosaic pictures. I have not yet had time to solve the difficulty myself, and I cannot hold out hopes that an estimate will be proposed this Session.

THE NATIONAL PORTRAIT GALLERY.—In reply to Mr. Beresford Hope, who asked a question in reference to a supposed outbreak of fire at the above named gallery,—Mr. Shaw Lefevre said on Monday: I am glad to be able to assure my right hon. friend that the occurrence to which he refers at the National Portrait Gallery did not assume the proportion of a fire. What occurred was due to an over-heated flue, which, through 9in. of solid brickwork, caused to smoulder a little hay with which some rats who had bored a hole through some concrete had made themselves a nest adjoining the brickwork of the flue. The smoke of the hay gave warning, and in a few minutes the danger was removed. There is no damage to the building or its contents.

THE METROPOLITAN WATER BILL.—In the House of Lords on Tuesday, Lord Camperdown asked whether, considering the present state of public business, it was not advisable to introduce in that House the Bill providing for the creation of a Metropolitan Water Trust. Lord Dalhousie replied that the measure was at present under the consideration of the Home Secretary, who had not yet arrived at any decision on the subject.

CHIPS.

The parish-church of Burstock, Dorset, has been restored, at a cost of £440, from the plans and under the superintendence of Mr. P. H. Peters, of Victoria-street, Westminster, and Sevenoaks, Kent.

The Beckenham local board accepted, at their last meeting, the resignation by Mr. Watkins of the office of surveyor to the board. At the same meeting it was decided to obtain tenders for the Shortlands section of the sewerage scheme, and it was reported that 8,248 yards, out of a total length of 24,655 yards of main sewering, had already been completed.

A new organ is being erected in the parish-church of Filey. Messrs. Forster and Andrews, of Hull, have taken the contract at £412.

St. Marychurch New Club and Coffee Tavern was opened on Saturday last. The style of the new building is Domestic Gothic, built entirely of red brick with dressings of Watcombe terra-cotta. The work has been carried out by Mr. A. Harris, builder, of St. Marychurch, from the designs and under the superintendence of Mr. E. Appleton, architect, Torquay. The cost of the building is £800, and of the furniture £300.

At a meeting of the Scottish Society of Water-Colour Painters, held in Glasgow on Tuesday, for the election of members and associates, Messrs. Pollock, S. Nisbet, and G. Straton Ferrier, artists, Edinburgh, were advanced from the ranks of associates to members, and Mr. Robert Little, also of Edinburgh, was elected an associate.

A winter meeting of the Bristol and Gloucestershire Archæological Society was held at the Ladies' College, Cheltenham, on Wednesday week, when two papers were read, one by Mr. G. B. Witts, descriptive of his exploration of the long barrow, recently discovered at West Tump, Buckholt Wood, which contained a walled passage 2ft. wide, of oolitic stones, leading to a chamber, these containing human skeletons and bones of deer and oxen, and flint arrow-heads. The other paper, by Mr. J. H. Cooke, of Berkeley, dealt with the sixteenth-century manuscript histories preserved in Berkeley Castle, and their author, John Smyth, of Dursley. A loan museum of antiquities was brought together at Cheltenham for the meeting.

A stained-glass window has been placed in Marlborough College Chapel to the memory of Mrs. Thomas, the wife of the bursar. The chief subjects are figures of St. Cecilia and Miriam, and beneath are groups representing the family at Bethany, and Ruth refusing to leave Naomi. Messrs. Clayton and Bell, of London.

At the half-yearly general meeting of the Great Eastern Railway, held on Friday, the Chairman stated, in reply to questions, that the directors had instructed Sir John Hawkshaw, C.E., to report as to the best site in Norwich for a new passenger station.

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ILLUSTRATIONS.

LYVEDEN NEW BUILDINGS.—FIRST PREMIATED DESIGN FOR THE LIVERPOOL SCHOOL OF ART.—DECORATION FOR A MORNING-ROOM.

OUR LITHOGRAPHIC ILLUSTRATIONS.

LYVEDEN NEW BUILDING.

LYVEDEN NEW BUILDING, so called to distinguish it from the neighbouring and less interesting Old Building, lies far away from everywhere in a Northamptonshire field. It is a ruin, the ruin of a house that was never finished, whose accomplished architect and owner, Sir Thomas Tresham, died in the midst of his labours, leaving not only Lyveden, but Rothwell Market House, and the Triangular Lodge at Rushton, as lasting monuments of his singular skill and untimely death. Lyveden Old Building was one of the seats of the Tresham family, Rushton was another, and both these belonged to the branch of which Sir Thomas was the representative at the end of the 16th century. He was a Roman Catholic, and suffered much for the sake of his conscience during the reign of Elizabeth. He was saturated with the spirit of his religion. No man who ever lived was more deeply versed in the mysteries of the Trinity, and no man ever gave quainter expression to his knowledge than the architect of the Triangular Lodge at Rushton. Of all his known works, this lodge is the only one that reached completion, for his death, which occurred in September, 1605, was speedily followed by the arrest of his son Francis for complicity in Gunpowder Plot, and Francis being gone, there was no one to carry out the uncompleted buildings, even if they could have been finished by any other hand than Sir Thomas's. But, unfortunate as was his death, it fixes to a year the date of Lyveden, for there are innumerable evidences of the sudden collapse of the works in consequence. The window-mouldings are unmitred, the shields are not all completed, while hardly any of the mouldings, chamfer stops, key-stones, and so forth, of the internal doors, are quite finished. This building is a singular example of the Elizabethan style, displaying an intensely Gothic spirit, clothing itself in Classic garments, and with an admirable judgment. For, whatever may be said against the employment of a complete entablature half-way up a building, there can be no doubt in this case as to its beauty and the refinement of its detail, nor as to its value in preserving, as it has, the remarkable sculptures with which it is enriched. The purist may shudder; but the artist will rejoice, and the historian shout aloud for joy. Bearing in mind that Sir Thomas Tresham was a scholar and a mystic, we find that whereas the ruling principle of the Triangular Lodge is 3, here we have as a basis the numbers 4, 5, 7. The plan is a Greek cross with 4 equal arms; and not only so, but each side of each arm is equal, measuring 23ft. (see sheet III.). The way in which this somewhat curious number (23) was obtained, seems to be as follows: The bay window was taken as a basis, each of its five sides being 5ft. long, and the canted side at such an angle as to be the hypothenuse of a right-angled triangle whose other sides (respectively 4ft. and 3ft.) would be formed by prolonging the adjacent sides of the bay (see Sheet II.). The distance from the side of the bay to the main angle of the building is also 5ft. This, then, gives three 5's and two 4's, or a total of 23ft. for the length of the main side against which the bay is placed. It may also be noted that, by this arrangement, the end of each arm of the cross is divided into 7 lengths of 5ft. Coming now to the elevation (Sheet I.), we find that the height from top of base to underside of middle cornice is about 11ft. 6in., or half the length of one main side. In the base itself we have in each side 4 bays of 3 shields, separated by three windows. The shields have never been carved, indeed, some of them were never fully outlined; but, judging by the Market House at Rothwell, the intention was to carve them with the arms of the county families. The total number of shields is 144, or 12 in each of the 12 sides. The windows between the shields light the basement—which is half in the ground. To light the ground-floor we have in each main side a window of 4 lights, and in each side of the bays 2 lights, except where the main entrance is. We now come to what is perhaps the most remarkable feature in the building, the middle cornice. This is enriched with 7 remarkable emblems (see Sheets I. and III.), which occur in regular succession with certain exceptions. Taking the end of any of the arms of the Cross, we find that in each of the 7 lengths of 5ft. occur two emblems. Starting on the extreme left (on the main wall), they begin with those marked I. and II. (see Sheet I.), and run up to VII. (see Sheet III.), they then start again on the front face of the bay with No. I. and II., and run up to VI., starting again on the main face with I. and II. Therefore, on the 3 chief faces of the ends of the wings are placed the emblems I. and II. Now, turning the right-hand corner and going down the main side of one wing, we start with No. III. (thus continuing the sequence from the bay side), and run regularly up to VII , a second series of 7 ending in the inner angle. Starting again from the inner angle, we begin with No. III. (I. and II. being quite omitted), and finally finish in regular succession with No. VII. at the outer angle, ready to begin the next bay side with No. I. as already described. There are consequently 12 emblems in each of the unbroken sides of the wings. It is unnecessary here to describe the emblems, that being done on Sheet IV., but it will be seen that the numbers 3, 4, 5, 7 still play an important part in the arrangement. The trefoil (in the band of No. I.) is from the arms of the Treshams. In No. II. it is difficult to explain the letters E. T. N. on the wreath. Can anyone make a suggestion? The ladder in No. I. has 5 rungs, that in No. VI. has twice 5, the 3 dice in No. VII. have each 5 pips, and so on. The carving of these emblems is very careful, but the arrangement is rather stiff and formal. Much of the work is as sharp to-day as when it was executed, partly owing to the excellence of the stone (a local stone from Stanion), partly to the protection of the overhanging cornice. The windows of the upper floor are similar to those of the ground-floor, but taller. We come now to the upper cornice or entablature, in the frieze of which are incised legends, as is also the case in the Triangular Lodge and Rothwell Market House. And here we have further evidences of Tresham's ingenuity. He chooses such legends (always in Latin) as shall fit as nearly as possible the various sides of the building, allowing one lineal foot to each letter. Thus in the Triangular Lodge, each side of which is 33ft. long, there are 33 letters. At Lyveden the same idea is carried out. On the sides of 23ft. are 23 letters; on the breaks of 5ft. are 5 letters. The legends commence on the north face of the north wing, by the main entrance, and each of the 7 lengths of 5ft. contains a word of five letters; the first of these, IESVS, being emphasised with a trefoil next the I (see Sheet I., also upper plan, Sheet III.). It will be seen that on the main wall to the left of the bay window, we have the word IESVS, and to the right the word MARIA. Now, if we look at the west wing and supply from "Bridge's" the words now missing, we find that we have the same arrangement, IESVS to the left, and MARIA to the right. On the east wing, too, the word MARIA would come in a similar position. We may conclude, then, that this idea was carried out in each case, but no record exists of the inscription previous to Bridge's time. The legends end on the east side of the north wing, thus completing the circuit of the building, and, whether by design or chance, the last inscription has one letter less than the number of lineal feet to be filled. This difficulty is surmounted by introducing the monogram XP, which forms a fitting termination to the whole. Internally, the building is finished with as much care as on the outside. From the front door on the ground-floor a vista is obtained right through the building. The arches are all of wrought stone, many with elaborate panelling; but are very difficult of access, as all the floors are gone. There are 4 rooms on each floor. The largest in the basement is evidently the kitchen, but it is very badly lighted. In the bay at the back of the fireplace are large ovens not shown on the plan; they are built outside of the main wall, under the ground. The south wing was probably entirely devoted to the staircase, and the other two rooms to stores, &c. On the ground-floor to the north wing would be the entrance-hall, the south wing the staircase, the two others habitable rooms with fireplaces. In the N.W. corner of the north wing or hall, and about 7ft. from the floor, is a square projecting niche, which may have been intended for Sir Thomas's patron saints. The east room on this floor is the only one which has the bay thrown into it. On the keystone of the arch leading to the bay are two shields, bearing respectively the arms of Tresham and Throckmorton, Sir Thomas having married Muriel Throckmorton. The doorways leading into the south wing or staircase, both on this floor and that over, are grouped into a striking feature on the side next the staircase, but none of their mouldings are entirely finished. On the upper floor, besides the staircase, there would be three habitable rooms with fireplaces. That in the west wing is the most important, or, at least, has the most elaborate fireplace, and was possibly intended for the use of Sir Thomas himself. It is in this thick wall over the kitchen fireplace that we should first look for signs of one of those secret hiding-places which were not unusual in the houses of the Catholic gentry in Elizabeth's time; but there does not seem to be any reason to suppose there was anything of the kind here. Of Sir Thomas Tresham's object in building this place we have no knowledge. Whether the numerous sacred emblems about the place are indications of its being built for religious purposes, or whether they are merely the inevitable expression of a mind so mystic as Sir Thomas's, it is difficult to determine, but the general air of the building is distinctly secular. But whatever its primary object, Lyveden was never so far completed as to fulfil it, and we probably see it now in much the same state as it was left. One of Cromwell's colonels is said to have tried to demolish it with cannon, but there are no evidences of such an attempt, though I believe it is true that he carried away the floor-timbers to use in his own house; the ends are still embedded in the walls. For this action of his, the man who measures the building is likely to be otherwise than grateful.

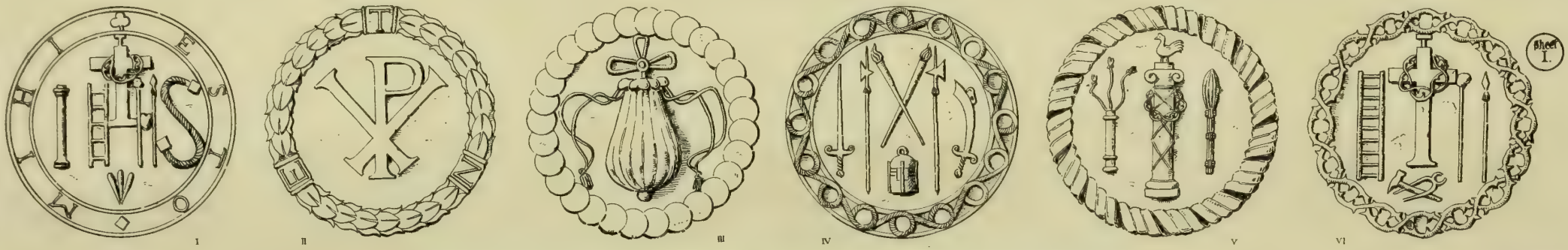
J. ALFRED GOTCH.

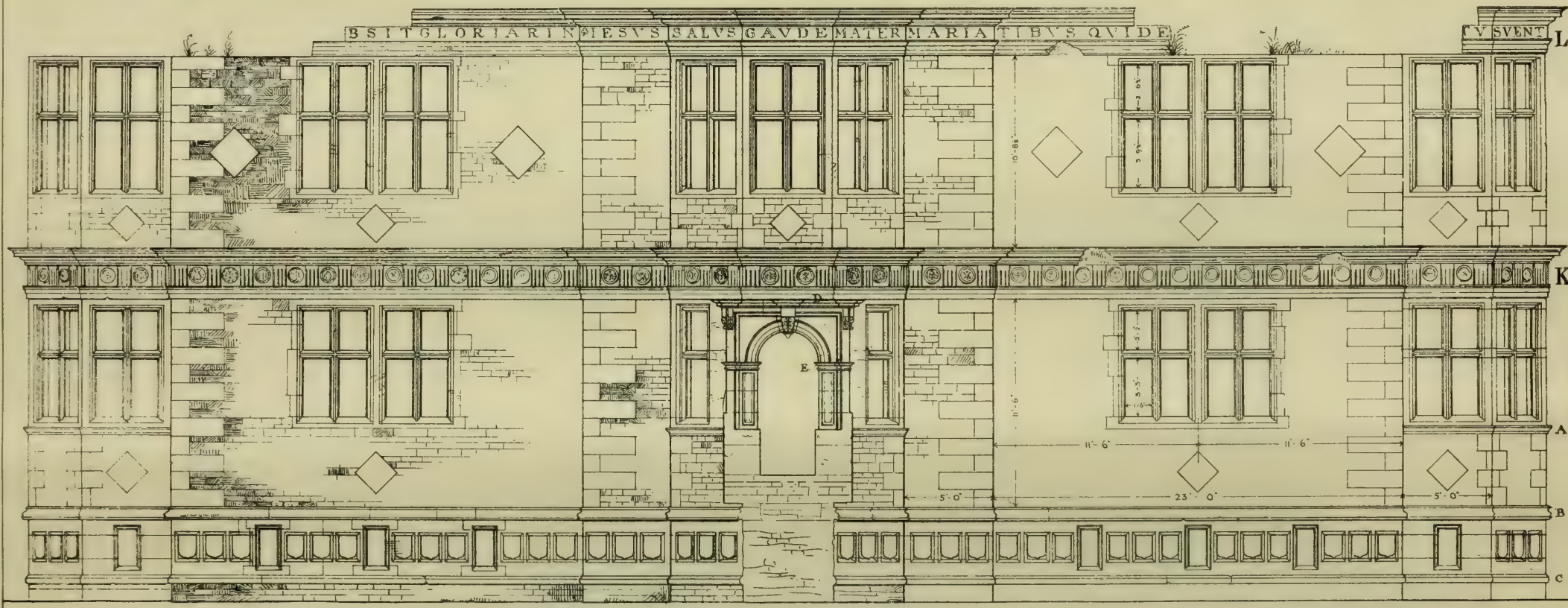
SCHOOL OF ART, LIVERPOOL.

WE illustrate this week the first premiated design, by Mr. T. Cook, architect, 12, St. George's-crescent, Liverpool. The areas of the various rooms were named in the conditions furnished by the committee to the competitors. They amounted to 6,936 supl. feet. The areas in this design amount to 7,186 supl. feet. All the rooms have north lights exclusively, except two, which have an east light in addition. Fresh air is admitted to all the rooms by Tobin tubes, and the foul air is extracted by vitiated air-flues, carried up with the smoke-flue from each fireplace, and also by additional flues in outer main walls, connected to Boyle's air-pump ventilators on ridges of roofs, by air-tight trunks. The building will be faced with Hollington stone.

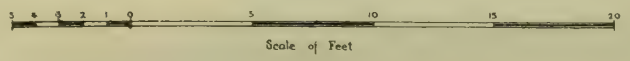
MORNING-ROOM DECORATION.

LAST week we illustrated a Gothic interior from the Royal Academy Exhibition, 1880, and to-day, from the same exhibition, we publish the side elevation of a morning-room in a later style, rather Jacobean in character. Mr. Walter Hensman, of Shepherd's Bush, W., is the architect of the work. The details underneath the general drawing include enlarged parts of the frieze and general wall-surface decoration.





NORTH ELEVATION.



LYVEDEN NEW BUILDING.

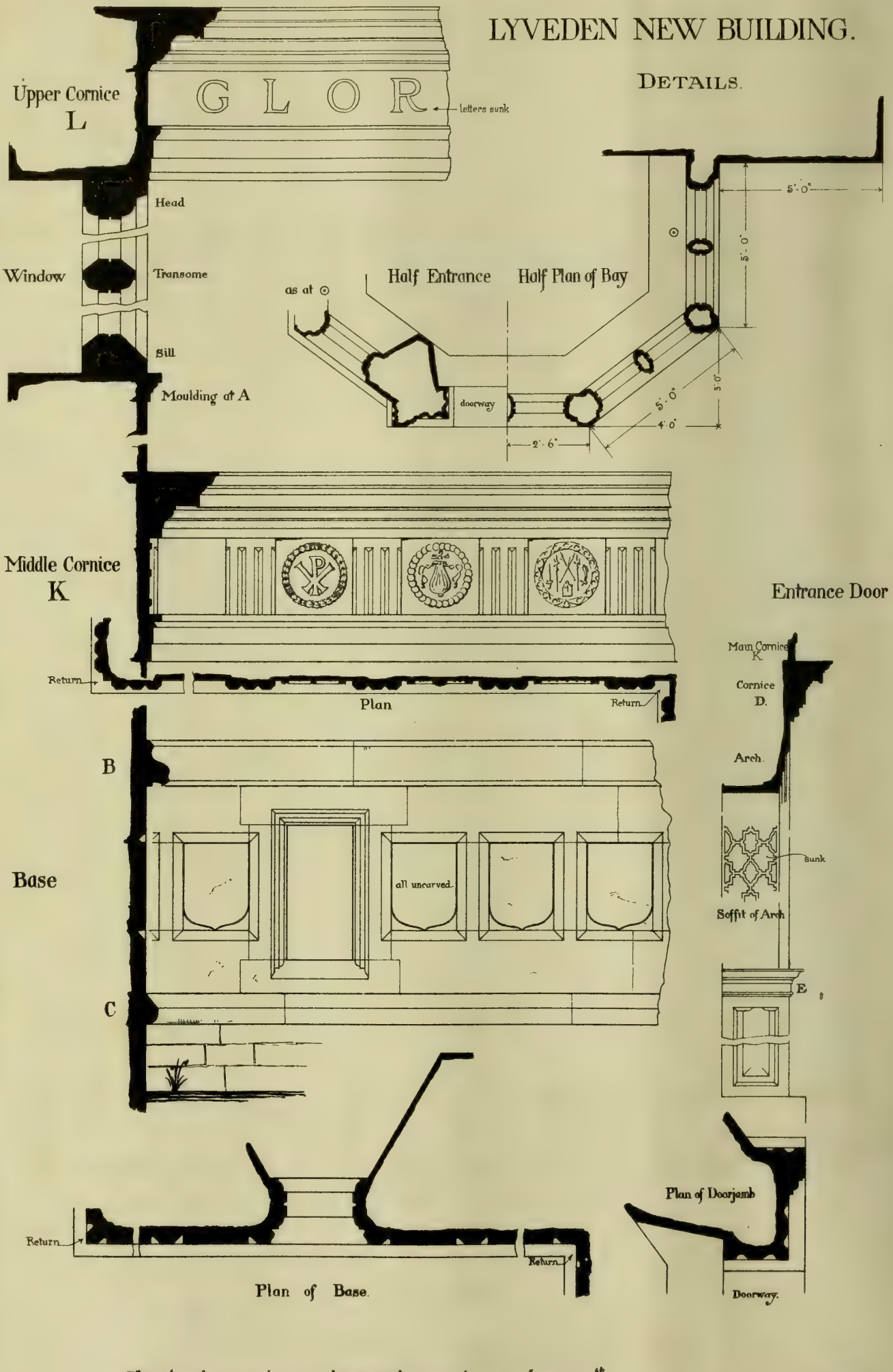
Meas.d & Drawn by J. ALFRED GOTCH.

Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

sheet II.

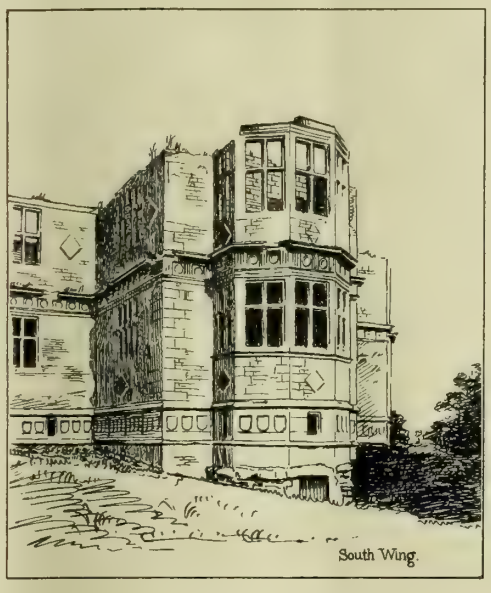
LYVEDEN NEW BUILDING.

DETAILS.

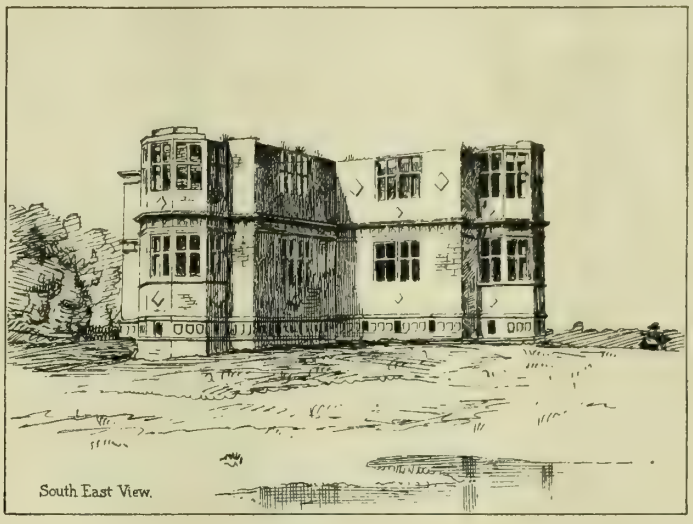


Sheet III.

LYVEDEN NEW BUILDING



South Wing.



South East View.

Explanation of Emblems

I Within the band; the Pillar, the Cross with crown of thorns, the Ladder, the Sponge and Spear with a Heart between them, a Cord (or Scourge?) in form of an S. The whole making monogram IHS.

II The monogram X·P· surrounded by a wreath of leaves, bearing on three bosses the initials E.T.N.

III Judas's Money-bag, surrounded by the thirty Pieces of Silver

IV A twisted Cord circumscribing swords, halberds, torches, and a lantern. To one of the swords is adhering Malchus's ear.

V Within a twisted linen wreath are the Scourge, the Pillar and crown of thorns, the Sceptre of Reeds On the Pillar stands the Cock, & round it is twisted a Cord.

VI A Crown of Thorns surrounds the Ladder, the Cross with crown of thorns, the Sponge, Spear Hammer and Pincers.

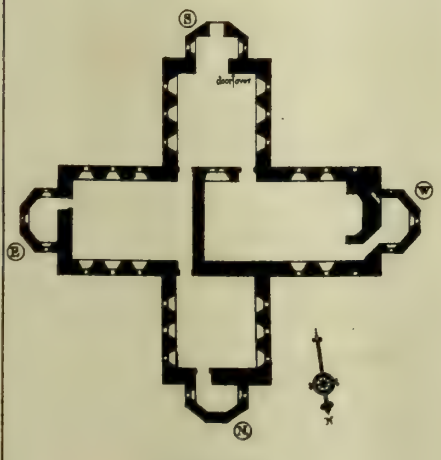
VII The seamless Garment, between three dice. In the circumscribing band are helmets and gauntlets.

VII^TH EMBLEM

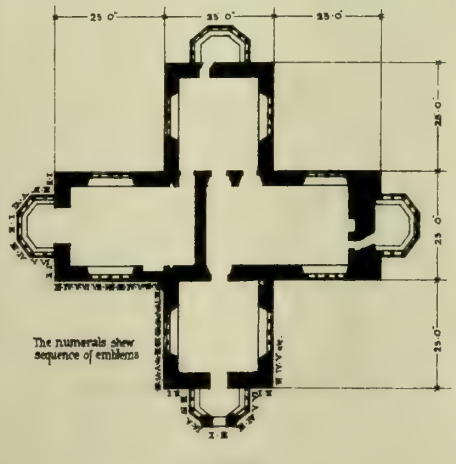
Legends in Upper Cornice.

[IESVS NVNDI SALVS
GAVDE MATER VIRGO MARIA
VERBVM AVTEM CRVCIS PEREVN-
TIBVS QVIDE[M STVLTITIA EST]
[IESVS BEATVS] VENTER QVI TE
PORTAVIT
[MARIA MATER VIRGO SPONSA
INNVPTA]
[BENEDIXIT TIBI DEVS IN ÆTER-
NVM MARIA]
[MIHI AVTEM A]BSIT GLORIARI
NISI IN CRVCE DOMINI NOSTRI X.

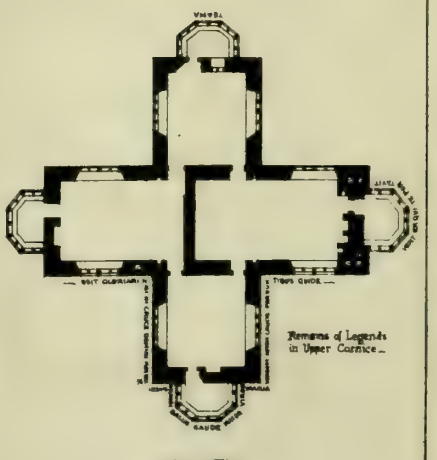
Of the above the portions in brackets are no longer extant; they are supplied from 'Bridges' Northamptonshire': but even in Bridges time (cir 1700) there must have been much missing, as the legends given by him would not extend round the whole Building. On the south face of the South Bay is legible TEAMA.



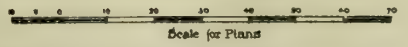
Basement Plan



Ground Plan



Upper Plan



Scale for Plans

Measured & drawn by J. ALFRED GOTCH.

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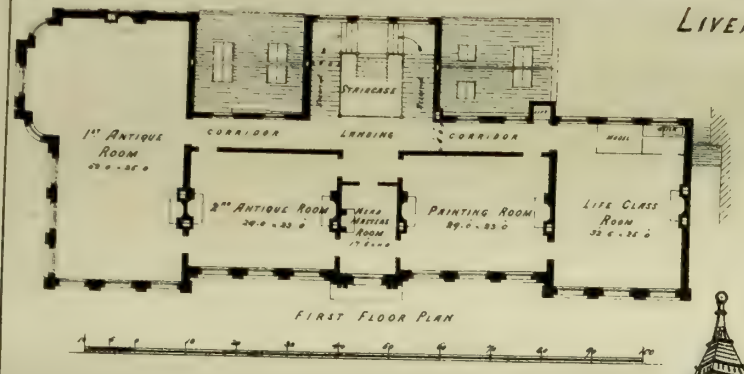
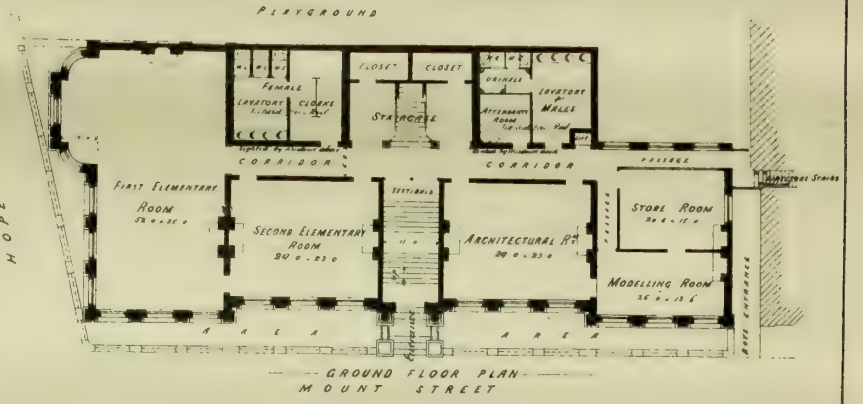
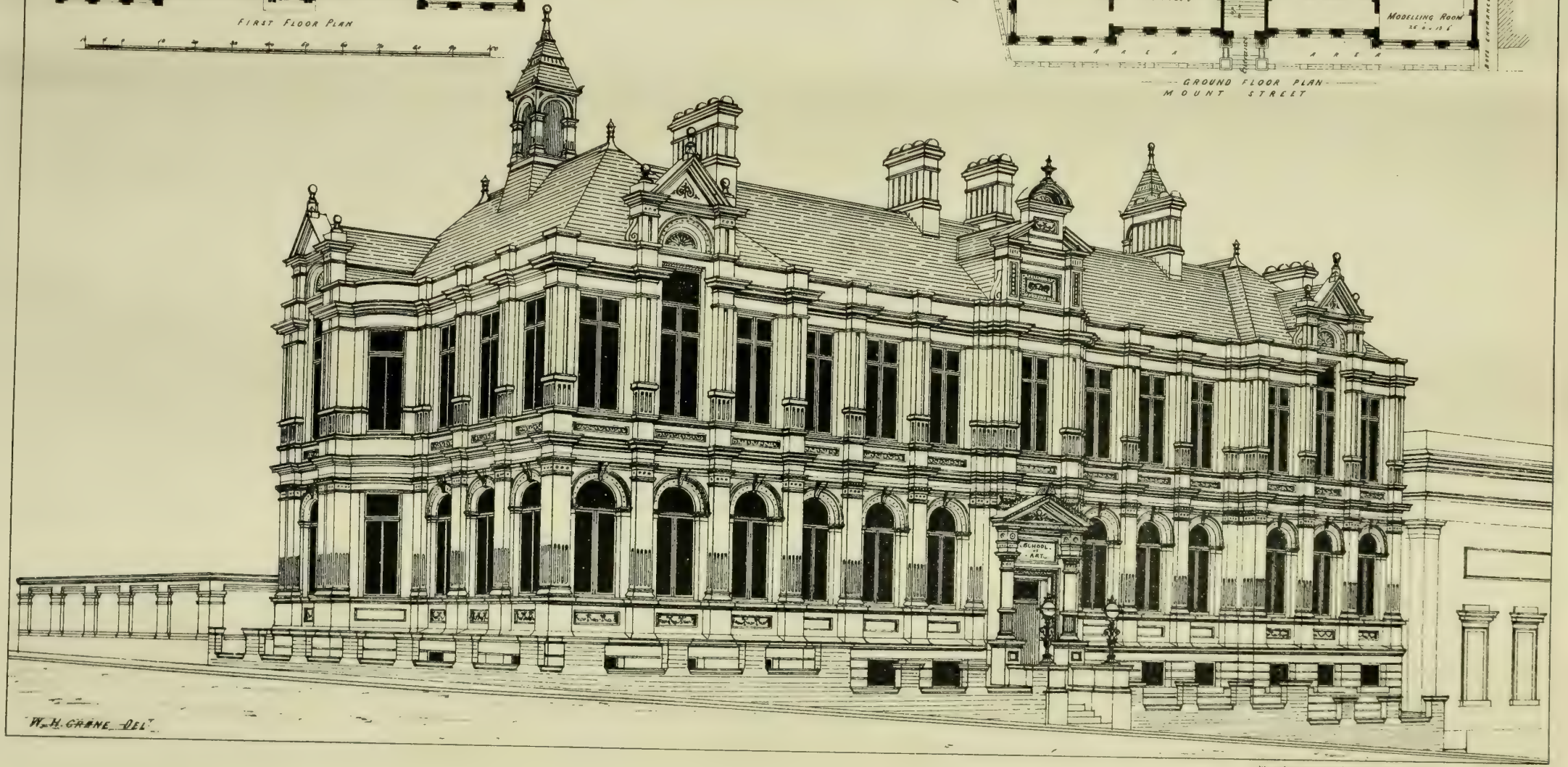
LIVERPOOL SCHOOL OF ART COMPETITION

FIRST PREMIATED DESIGN

THO.S COOK ALLEN







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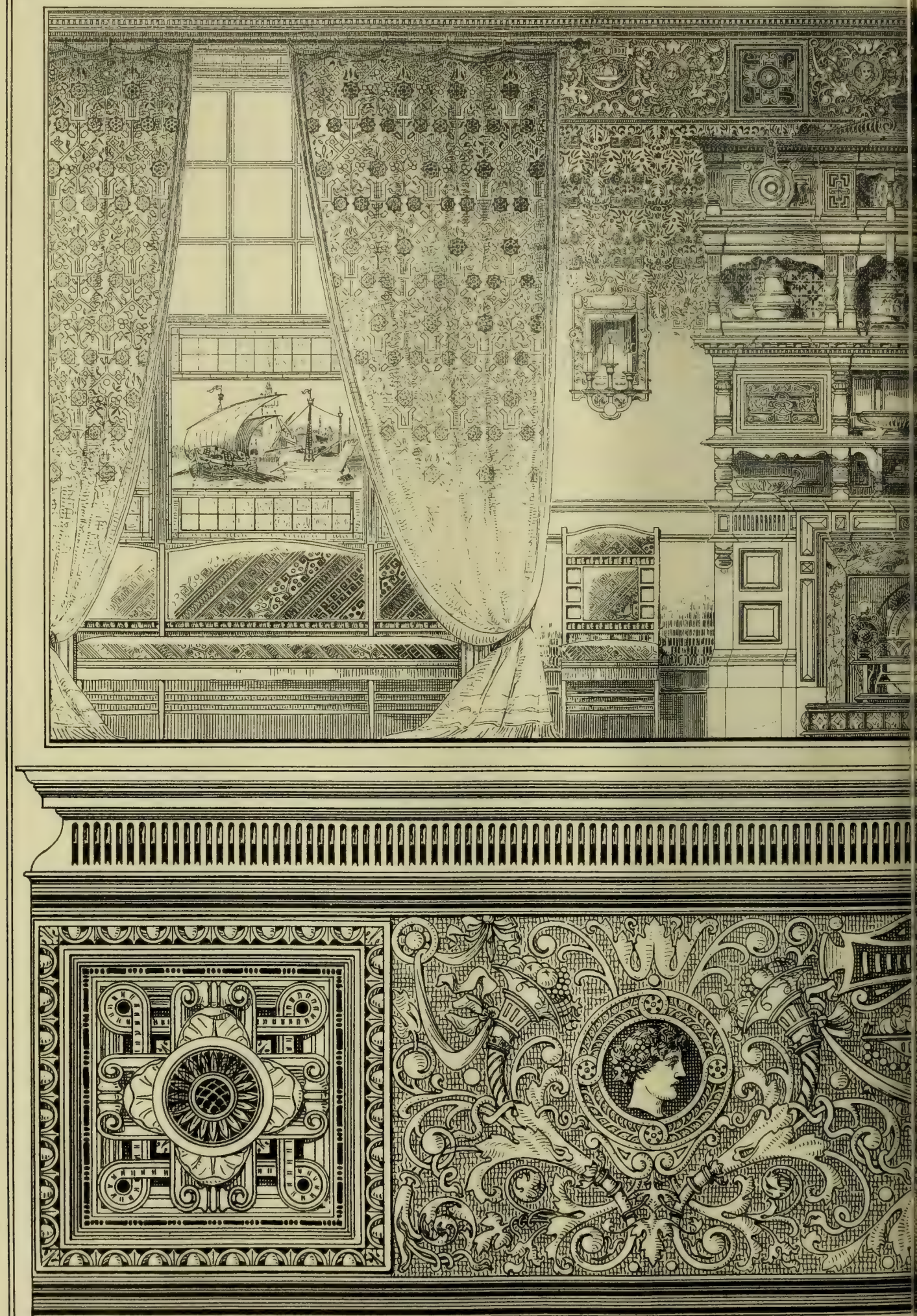

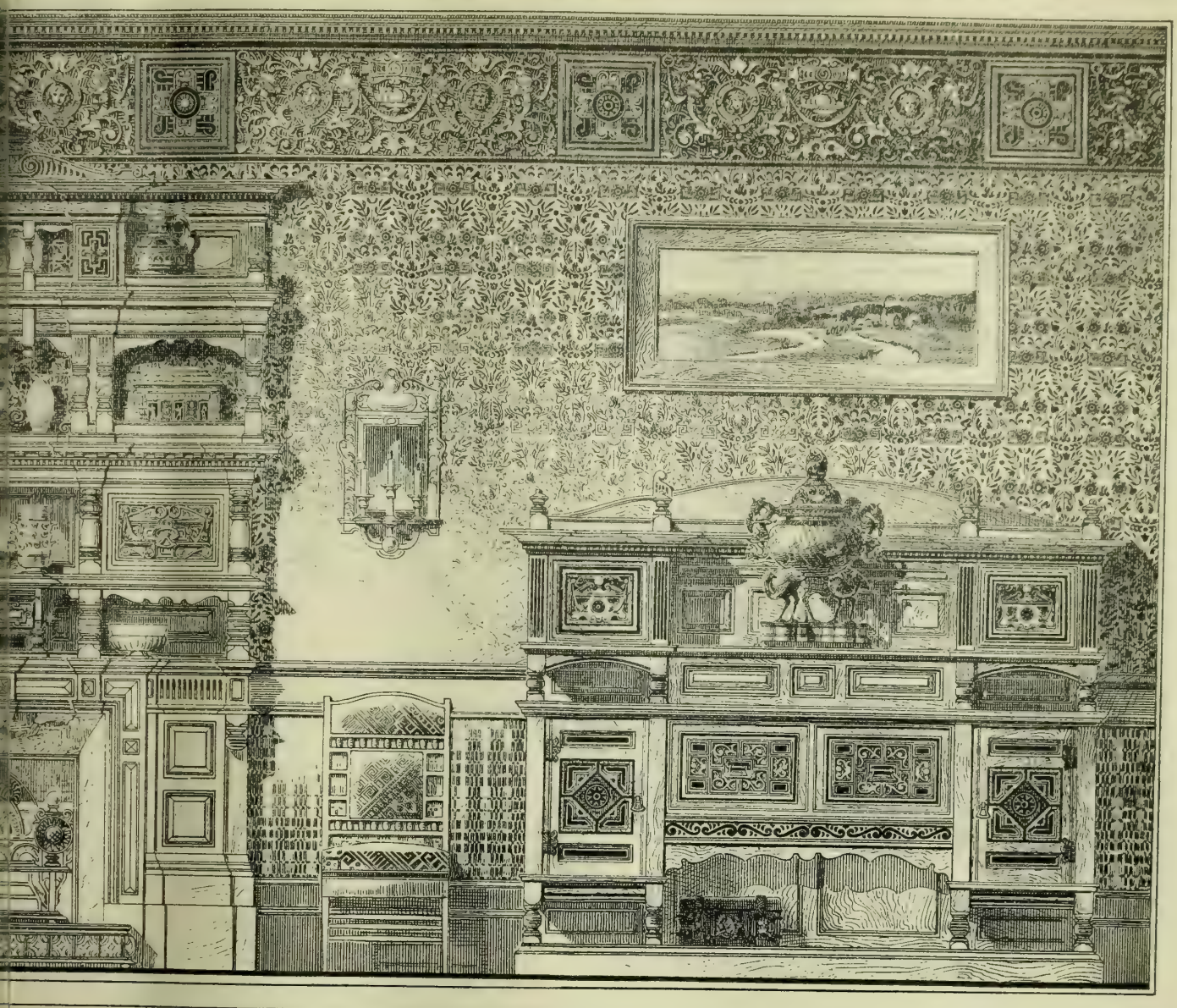

MORNING:ROOM DECORATION WITH:DETAILS:OF FRIEZE:AND:GENERAL WALL:SURFACE:BY WALTER HENSMAN

Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W C

EBERHARD AND CO.'S PATENT PARQUET FLOORS.

WE have lately had brought to our notice a new method of laying parquetry, which promises to supersede the usual mode of application. Messrs. Eberhard and Co., of Edward-street, Hampstead-road, the inventors of this system, have recently laid down a parquet floor at Marlborough Rooms, Regent-street, not upon the usual wooden ground, but upon a cement foundation, and it is this particular application of it that calls for notice. The room in question is about 40ft. square, and is to be used for assemblies, banquets, and balls, and the old floor consisted of brick arching resting on iron girders and finished with concrete and cement. The surface had become cracked and uneven. A floor of parquetry was decided on, and Mr. Tyler, the architect of the alterations, finding the usual system of laying impracticable, applied to Messrs. Eberhard to undertake the work, which has been performed in a manner highly satisfactory. Messrs. Eberhard's process consists in fixing the parquetry upon an adhesive bed of their patent glue—a composition at once hard, impervious, and capable of forming a level surface for the parquet. This "patent glue" can be floated upon the most uneven kind of flooring without recourse to any other preparation, and the result, from a personal inspection of it on both cement and boarded floors, we consider, can be confidently recommended to the profession. At the Marlborough Rooms, it was necessary to make up the sunk portions of the floor with the patent composition—a difficulty which is at once removed by its use, and on this account it becomes a most valuable groundwork for parquetry upon staircases, corridors, and landings, where the traffic and wear are constant and great. At Messrs. Meeking's premises in Holborn, it has been successfully used for the latter purpose on the principal stairs of stone, which had become worn to a considerable extent, in some places, we hear, as much as an inch and a half. But another advantage of this mode of laying is that it saves quite 30 per cent. of material, and enables parquet of 3-8ths of an inch in thickness to be used, instead of the usual inch stuff. It must be obvious to anyone who knows how ordinary parquetry is made, to see that its wearing surface is not more than that thickness, as directly 3-8ths of the stuff is worn down the tongues are exposed. In reality, therefore, the 3-8th of an inch parquet laid by Messrs. Eberhard is quite as lasting as the inch, while the solidity, permanency, and imperviousness of the bedding are superior in many respects to the ordinary system of laying down. A large drawing-room in Grosvenor-square, which we also inspected, shows that the patent glue can be used with equal advantage upon ordinary floor-boards, their uneven and worn surfaces being made up by the composition. The glue is simply spread over the surface after heating, and the parquet squares pressed upon it. In a moment after the parquet becomes immovably fixed, and after setting, nothing will separate the two without splitting the wood. We understand the cost of laying a plain Stettin oak star-like pattern is 2s. per foot super for the centre, and 2s. 6d. for the border. The firm supplies flooring to the trade from 7d. per foot, their "patent glue" being £4 per cwt. The permanence and solidity of the bedding, its impermeable nature, and especially the great economy effected by a reduction in the thickness of the parquet, recommend Messrs. Eberhard's system to the attention of all architects.

THE CAPITALS IN THE CRYPT OF CANTERBURY CATHEDRAL.*

MR. J. DONKIN, architect, has just brought out a small volume of illustrations of the capitals in the crypt of Canterbury Cathedral. Every visitor to that grand old structure must have noticed the great crypt which forms one of the chief attractions of the cathedral. No English crypt can compare with it in size or architectural importance, and it is not remarkable that the author should have been tempted to transfer to paper the various grotesque carvings on the capitals of the pillars which support the vault. Many of the ornaments are certainly very early Norman, and the general opinion of antiquaries points to the year 1073, as the date of the rebuilding of the crypt by Archbishop Lanfranc. Subsequent alterations were made, however, and the pillars were, as the author says, readjusted to suit the rebuilt choir above. We have already reproduced several of Mr. Donkin's drawings in our pages. These capitals are executed with great vigour, though they are essentially rude, and the author thinks, not without reason, that the subjects represented by the carver may have been dictated as much by fancy as by the desire to produce allegorical designs. There are no less than 24 plates of lithographs: two represent views of the great crypt as rebuilt about 1095, and the eastern crypt, the original burial-place of Thomas à Becket, built by William of Sens about 1175 A.D. The figures in the capitals of plates III. and IV. are exceedingly grotesque and spirited; the faces of the knights or crusaders represented are almost comic in their features. The subject in another capital is certainly more symbolic—a ram's head, made to resemble a man, and the arms, holding a fish in one and a cup in the other, are Christian emblems, but the winged animal upon the neck of capital is not so clear. In the next capital is a representation of a half-human being with double head, riding on a peacock, the symbol of the Resurrection, and this one and those on plates 10, 18, and 21, are striking examples of clever symmetrical and decorative treatment.

* The Capitals in the Crypt of Canterbury Cathedral. Described and illustrated by J. DONKIN, Architect. London: W. J. Johnson, 121, Fleet-street.

ST. MARK'S, VENICE.

THE following circular letter has been addressed by the St. Mark's Committee to their foreign members:—

St. Mark's Committee,
9, Buckingham-street, Strand, W.C.
18th January, 1881.

SIR,—I have the honour of bringing to your notice the resolution passed at the General Meeting of the St. Mark's Committee of the 17th instant.

In consequence of an address delivered by Cavaliere Azzurri on the 29th October, 1880, in the course of which the Cavaliere, who is President of the Academy of St. Luke, deplored the recent restoration of St. Mark's in these words:—"It is indisputable that the injuries inflicted upon the characteristic value and integrity of this building by these works are of the gravest kind," and expressing in the name of the Academy their sympathy with the object of the Committee, the St. Mark's Committee considered it their duty to put themselves in communication with the Academy, and have adopted the following address:—

"To the President of the Academy of St. Luke.

"The St. Mark's Committee, at a General Meeting held at the residence of Mr. G. E. Street, R.A., Professor of Architecture at the Royal Academy of Arts, London, desires to thank you for the manner in which you have expressed your opinion upon the subject of the preservation of the basilica of St. Mark. This Committee expresses its profound satisfaction to find, by the letter and speech of your Honourable President, Count Azzurri, that he entirely agrees with this Committee upon the question, and is desirous of making the Academy the intermediary of all communications the Committee may have to make with regard to the building. The Academy of St. Luke may well be considered in virtue of the illustrious names among those of your own countrymen, as well as the many distinguished foreigners who enjoy its membership as the authoritative representative of the internationality of art, and the Committee hopes to find in the Academy a firm basis of support and a judicious appreciation of the sentiments which inspire any observation the Committee may feel it necessary to make on the subject.

"HENRY WALLIS, Hon. Secretary."

METROPOLITAN BOARD OF WORKS.

THE weekly meeting of this board was held on Friday, when a deputation from the Lewisham and Lee Inundation Committee attended to present a memorial, signed by 3,000 persons, on the subject of floodings in the districts of Lewisham and Lee. It was stated that these floods resulted from the overflow of the rivers Ravensbourne, Quaggy, and Poole, the outfall of which was in another district, and also from the storm-overflow from one of the Metropolitan main sewers into the Ravensbourne at Catford-bridge. The memorial was referred to the works committee.

It was decided to inform the vestry of Newington, in reply to a letter as to the action of the Lambeth Water Company in cutting off the water supply to certain houses in that parish, that the board will on the first opportunity consider as to obtaining an alteration of the existing law, and will do their utmost to protect the interests of the consumers. A report was received from the fire brigade committee, submitting the names of six candidates for the post of second officer in the Metropolitan Fire Brigade, from amongst 105 applications. Mr. J. S. Simonds was elected.

A report was received from the Parliamentary committees as to the tramway schemes and bills, recommending that consent be given to the North London Suburban, the Woolwich and South-East London, the Canning-town and Plaistow, and the Shepherd's Bush, Gunnersbury, and Kew Tramways schemes, with reference to which provisional orders had been applied for to the Board of Trade; and also to the Lea Bridge, Leyton, and Walthamstow, and the Southwark and Deptford Tramways Bills, on undertakings being respectively given to amend the Bills in Parliament. This was agreed to with the exception of the Kew scheme, reserved for further consideration.

The prevention of floods committee presented a report, which was adopted, recommending that the Victoria, Albert, and Chelsea Embankments be protected from overflow to a further extent of 6in., viz., to 5ft. 6in. above Trinity high-water mark, instead of 5ft. as at present, and that the engineer be instructed to prepare plans. The engineer's plans for the prevention of floods in the Chelsea District were submitted and approved, with the alteration of height from 5ft. to 5ft. 6in., and it was decided to vary the height of the works already ordered in Westminster in similar manner, and to require the owners of river-side property who have already raised their walls, to comply with the new regulations; those who have raised them to be advised to add another 6in. to their walls. It was explained that the former limit was fixed because experience showed that no high-tide had ever risen over 4½ft. over high-water mark, but the tide of the 18th Jan. reached a maximum of 5ft. It was further reported that two-thirds of the owners of river-side property had complied with the new regulation and raised their walls to the 5ft. limit.

COMPETITIONS.

HOUSE SANITATION.—The Council of the Society of Arts offer the following medals for plans showing the best sanitary arrangements in houses built in the metropolis, such plans to be exhibited in the Society's Rooms, Adelphi, in June, 1881, and to be sent in on or before 12th May, 1881:—1. One silver medal for the best sanitary arrangements, carried out and in satisfactory working, in a house let out in tenements to artisans, for which a weekly rental is paid. 2. One silver medal for the best sanitary arrangements, in actual working, in a house of the yearly rental of £40, or less, to about £100 in value. 3. One silver medal for the best sanitary arrangements, in actual satisfactory working, in a house of the yearly rental value of £200 and upwards, to any amount. 4. The houses must be open to the inspection of the judges, who, in considering their award, will be guided by the suggestions of plans for main sewerage, drainage, and water supply, made under the Public Health Act, 1875. The houses must have been in actual occupation within the last three months, and a certificate must be given by the occupiers, on a printed form, stating the satisfactory working of all the sanitary arrangements, such form to be obtained at the Society of Arts. 5. The houses may be old, fitted with modern sanitary arrangements, or may be new. They must be within the metropolitan area of the Board of Works. 6. The sanitary arrangements must include the conditions for good water supply, drainage, warming, and ventilation of the house, and precautions taken against frost. 7. The medals may be awarded to the occupiers of the houses, or the lessees, or the owners. 8. The plans must consist of a ground-plan and sections, to the scale of not less than one inch to five feet; details of not less than one inch to the foot; the plans may be accompanied by specifications. 9. The names of the architects, surveyors, or sanitary engineers who directed the sanitary arrangements should be given, and certificates will be awarded to those whose plans obtain the medals.

KENDAL.—The design of Mr. D. Brade, of Kendal, submitted under the motto "Leviticus," for the proposed hospital for infectious diseases in Kendal, has been selected by the corporation. The design marked "Sylva," also by a local man, Mr. Martindale, was considered by the committee very good, but was rejected because the cost exceeded the stipulated sum (£1,200) by

£600. Only one other plan, "Health," was received.

NEWBURY.—Mr. Alfred Waterhouse having been called in to advise the trustees, examined the plans last week, and the first premium of £50 for the best design has been awarded to Messrs. Power and Hughes, of Leadenhall House, London, the second premium of £25 going to Mr. Chas. H. M. Mileham, of 114, Gower-street, London. Our review of the designs appears elsewhere.

PIETERMARITZBURG.—The town council of Pietermaritzburg, South Africa, received 15 sets of plans, some from England, others from the Cape, for a new town hall, proposed to be erected on the Market-square, facing Commercial-road, at a cost stipulated not to exceed £20,000. The committee appointed to consider the designs were assisted by professional advice, and awarded the first premium (£100) to the set with the motto "Africa," the second, of £50, to "Labor Omnia Vincit." It was found the former had been sent by Messrs. Welchman and Reid, of Grahamstown.

THE ROWLAND HILL MEMORIAL.—Sir Frederick Leighton, P.R.A., Mr. Calder Marshall, R.A., and Mr. Woolner, R.A., who acceded to an invitation of the Rowland Hill Memorial Committee to adjudicate upon the various models sent in by competing artists for a statue of Sir Rowland to be erected at the Royal Exchange, have decided that a model, which proved to be the work of Mr. E. Onslow Ford, gives the best promise, but they advise that the artist should be requested, before the commission is intrusted to him, to send in another design on a larger scale.

SELBY SCHOOLS COMPETITION.—In response to the invitation to architects to prepare plans for the new schools and alterations to the chapel, about 35 sets of drawings were sent in, and the committee, after carefully considering the merits of the respective sets of designs, selected six for final consideration bearing the following mottoes, viz., "Raikes," "Experience" (motto in red lettering), "Experimental," "Liverpool," "Spes," and "Wesleyan." At a subsequent committee meeting this number was reduced to four, "Spes" and "Wesleyan" being put aside, and it was finally decided to place the remaining four designs in the following order of merit, viz.:—1st, "Experimental"; 2nd, "Liverpool," by C. O. Ellison, of Liverpool; 3rd, "Raikes," by E. Birchall, of Leeds; 4th, "Experience," by William H. Thorp, of Leeds. We have not heard the name of the successful architect who is to carry out the work, but understand that he is a Manchester man. "Liverpool," by C. O. Ellison, of Liverpool, receives the second premium, and "Raikes," by E. Birchall, of Leeds, the third.

CHIPS.

Plans for a new church at Lawkholme, Keighley, at a cost of £2,600 for nave only, without pews, are being prepared by Mr. J. Bailey, architect.

The parish-church of Chaceley, Gloucestershire is about to be restored from the designs of Mr. Ewan Christian, at an estimated cost, exclusive of the chancel, which will be undertaken by the Ecclesiastical Commissioners, of £1,500.

A new peal of bells have been presented to the parish-church of St. Oswald, Compton Abdale, by the vicar. The bells are six in number, replacing four smaller ones, and were cast by Messss. Warner and Son, of London; Messrs. Savory and Sons, of Painswick, erected the frame.

Mr. Robert Morgan, C.E., as Local Government Board inspector, held an inquiry at Derby on Thursday week in regard to a petition presented by the Corporation for the issue of a provisional order as to the acquisition of certain lands for the building and improvement of streets, and also to an application for sanction to borrow £5,650 for works of street improvement. The plans were explained by Mr. Coulthurst, borough surveyor, and no opposition was offered to the proposals.

Mr. Edwin Crossland, timber merchant, Halifax, was seriously injured on Wednesday week, while inspecting the boiler at his works, by the fall of the weight attached to the boiler, which fractured one of his thighs in two places and also injured his back.

We understand that a very effective design for the proposed cathedral church for the Isle of Man has been prepared by Mr. J. Pitt Bayley, architect, Fulham-place, Paddington, W. The drawings, which are accompanied by a report, are in the hands of the High-Bailiff of Douglas.

Building Intelligence.

BUILDINGS IN BIRMINGHAM.—The following is a return of new buildings, either erected or for which plans were approved by the borough surveyor, during the year 1880, together with the returns for the previous years:—

	1880.	1879.	1878.	1877.	1876.
Houses and shops	1,301	1,197	1,205	2,700	2,903
Churches	—	—	—	1	1
Chapels	1	—	1	3	5
Schools	—	—	4	6	6
Manufactories and warehouses	64	102	64	86	107
Miscellaneous	71	101	96	90	43
Alterations, &c.	222	225	290	167	52
	1,659	1,625	1,660	3,053	3,177

Under the class "Miscellaneous" are included —County-court, nurses' home and burn ward at the General Hospital, Free Library (Constitution-hill), library for the Society of Friends, St. Agnes Home and Orphanage, the drill-hall (Thorp-street), additions to the Society of Artists' rooms, two assembly-rooms, the Junior Liberal Club, the new arcade, premises for the Household Supply Association, club and institute, &c. The number of plans submitted for approval for the past year was 510.

EAST THORPE.—The corner-stone of St. Paul's Church was laid at East Thorpe, Mirfield, on Tuesday week. The church is on plan a parallelogram, 97ft. long by 49ft. wide inside the walls, and will be divided by arcades of seven bays, forming a nave and chancel, with aisles of equal width through, the main span being 18ft. 6in. and the aisles each 13ft. wide. The style adopted is 14th-century Gothic. The columns of the arcades will be of Dalbeattie granite monoliths, placed on octagonal stone bases. The seats throughout will be of oak; the chancel-floor is raised four steps above the nave, and will be seated with stalls for a choir of 40 voices. A principal external feature will be the tower, which will be 20ft. square, and will consist of four stages, including an organ-chamber immediately over entrance, and will have a stone gabled roof, finished with wrought-iron cross. Great difficulties have been experienced in laying the foundations, the site being of gravel and sand, which formerly was the bed of the river; but these have been overcome by a liberal use of concrete, put in to an average depth of 11ft. Mr. W. Swinfen Barber, F.R.I.B.A., of Halifax, is the architect, and the contractors are Messrs. William and Joshua Milner, masons; Mr. George Charnock, carpenter; and Mr. John Naylor, plumber, all of Halifax.

SHARROW.—ST. ANDREW'S (NEAR SHEFFIELD.)—The interior art-decoration of this church, on a somewhat extensive scale, has just been completed. The treatment of the chancel exhibits a great amount and variety of elaborate yet congruous and chastely harmonious ornamentation, inframing and surrounding entablatures containing the principal mural subject-frescoes. These are, on the north side, the Twelve Apostles, with their respective emblems, the legend beneath being, "The glorious company of Apostles praise Thee"; and on the south twelve of the Prophets, with the subjoined legend, "The goodly fellowship of the Prophets praise Thee." The figures and entablatures, of which the ground is dead gold, are in spirit fresco, their subdued effect depending mainly on outline, with but a sparing use of colour, yet all sufficiently distinctive. The whole chancel-work is on a vellum-coloured ground, diapered and lined in ashlar pattern, surmounted by a richly-ornamented frieze. A dado in dusky red carries the sacred monogram, I.H.S., round the entire chancel, the principals of the roof being also richly decorated in gold, red, and black. The whole interior of the church has also been painted, coloured, and murally decorated, the richer and more pronounced decorations being, however, confined to enunciating the salient features of the architecture. Above all the principal windows and large arches are elaborately-ornamented ribands, emblazoned with various text legends. The designs were prepared and the whole work executed by the art firm of Powell, Brothers, Leeds, who have also been intrusted with the decoration of the organ and pipes.

TEWKESBURY ABBEY.—The Tewkesbury Abbey Restoration Committee met last week, when, after a discussion on a letter received from their architect, Mr. J. Oldrid Scott, respecting the restoration of the west front, it was resolved, "That there being conflicting opinions on the part of the architect and members of this committee with respect to the restoration of the west front, the further consideration of the same be postponed until the opportunity arises for the architect and the committee to have a personal conference." An offer by Mrs. Glynn of £300 for a stone pulpit, to be constructed from a design by Mr. Scott, was accepted with thanks, as was also one from Sir Edmund Lechmere, chairman of the committee, of £150, to be expended in the restoration of the morning apsidal chapel, under Mr. Scott's direction; this was in place of an offer of £125 for a canopy to font, which will be provided by Mr. and Mrs. B. T. Moore. A letter was read from Mr. Charles Stanton, of Upfield, Stroud, offering to restore the figure of the Virgin and Child, in the niche over the north porch, at a cost of £75, but as their architect doubted the desirability of interfering with the remains of the ancient figure and niche, it was decided to submit Mr. Scott's opinion to Mr. Stanton for his consideration.

WEST BROMWICH.—The mission church of St. Michael and All Angels, West Bromwich, was opened on Tuesday last by the Bishop of Lichfield. It has been erected at the sole expense of the Rev. H. Jesson, curate in charge, from the designs of Messrs. Wood and Kendrick, architects, West Bromwich, by Messrs. Stockton and Sons, builders, Oldbury. The church consists of nave capable of seating 250 persons, also chancel, sacristy, baptistery, and choir vestry. The materials used are brindled bricks and Portland stone. The chancel is separated from nave by an elliptical-moulded arch, in the centre of which is a massive rood-screen. The chancel contains seats for choir, sedilia, and piscina, the roof being supported on hammer-beam principals. The design of the church is 14th-century Gothic, and it has cost £1,500.

CHIPS.

Apropos of the recent stoppage of water-pipes by frost, the *South London Press* suggests that the duties of district surveyors might be, with advantage, enlarged, so as to insure that houses in course of building should be so supervised that the water-pipes connected with the main should be laid sufficiently deep, and brought into the house, as to escape the freezing of their contents, and the stoppage of the water supply of the family. At present, the pipes are too often laid but a very few inches from the surface.

At a meeting held at Drogheda on Sunday, plans prepared by Mr. P. J. Dodd, of that town, architect, for a new Roman Catholic church of St. Mary, were approved, and £4,150 was subscribed in the room towards the cost. It will consist of nave, aisles, bell-tower, chancel, and two side-chapels, and two sacristies. The outside dimensions will be 135ft. by 65ft., and the tower is to be 196ft. high. The foundation-stone will be laid on March 25th.

The St. Pancras Ironworks Co. have issued a neat and appropriately designed calendar for 1881, exhibiting a design for an entrance-gate.

At the annual meeting of the Gloucester and Bristol Diocesan Church Building Association, held on the 27th January, the following grants were voted:—For churches: Whitehill, £80; Crudwell, £60; Brimscombe, £50; Shorncote, £40; and Aldworth, £30. For schools: Eastington, £35; Northleach, £20; Minchinhampton, £20; Broad Blunsdon, £15; and Oakbridge, £5.

A coffee-tavern was opened at Milton-next-Sittingbourne on Thursday, Jan. 27th. It has been built by Mr. John Seager, of Borden, from the plans and under the superintendence of Mr. W. L. Grant; the cost has been £1,140, exclusive of purchase of site.

New borough offices are in course of erection at Poole, from the designs and under the superintendence of the borough surveyor. Mr. Morris is the contractor.

A stone monument, weighing about 30 tons, has been constructed by convicts in St. Mary's Prison, Chatham; it is to be removed to Portsmouth, and set up in front of Haslar Hospital, as a memorial to the officers and men lost in the training-ship, *Eurydice*.

Mr. E. E. Croucher, land-agent and auctioneer, has removed from 38, Southampton-buildings, to more commodious offices on the ground-floor of No. 76, Chancery-Lane (three doors from Holborn). His branch-office at 223, Seven Sisters-road, N., will be continued as before.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

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N.B.—Cases and vols. must be ordered through a bookseller or newsagent, as the regulations of the Post-office prevent them from being sent by post.

PONTEFRACT TOWN HALL.—ERRATA.—The authors of the design placed first in this competition are Messrs. Perkin and Bulmer, of Leeds, and not Mr. Perkins, as stated in our last issue.

RECEIVED.—A. S. and Co.—B. of K.—W. M. F.—G. S. S.—J. H.—H. U.—F. W. R. and Co.—R. B.—F. and B.—G. B. and L.—A. B.—R. P. C. Co.—T. W. and Son.—W. J. B.—W. T. and Sons.—J. T. and Son.—A. H. B. and Co.—S. and Co.—S. P. and Co.—M. and Co.

FIAT JUSTITIA RUAT CŒLUM. (We could only publish your letter with your name appended.)—A. H. B. (We know of no good book. Try at Batsford's, 52, High Holborn.)

"BUILDING NEWS" DESIGNING CLUB.

J. W., J. SMINT, AND OTHERS. (The rules and conditions of the Designing Club appeared in the BUILDING NEWS of Oct. 22, 1880.)

Correspondence.

THE ARCHITECTURAL MUSEUM.

To the Editor of the BUILDING NEWS.

SIR,—You are at all times willing to do an act of justice: will you kindly do me one? In your report last week of the annual meeting of the Architectural Museum, at which Mr. Lomax, the sub-secretary, was present, it is stated that the very foundation of the institution was built on the idea of tempting the workmen of our day by the placing before them fine examples of the old and past arts of architecture and sculpture, and by the award of premiums for the rendering of these on paper; in other words, of making drawings more or less elaborate and finished, of such details on paper, just, indeed, as is now done every day, and year after year at the Royal Academy, and at the British Museum, at South Kensington, and other schools. Will you allow me to say that it was *not* the extension of this idea, but its very reversal, which founded the museum in Cannon-row? When I first saw the late Sir G. G. Scott on the subject of the museum and school attached, I tried to show him how much was lost by the then, as now, universal system of learning *to draw* as it is termed, the more especially when the workman is the subject of it; and I reminded him that in the old Gothic days, when the workman was at least a something, and a *power* in art, that even the very paper on which we work so industriously did not exist to draw on, and that consequently the art-power of the workman, whatever it might be, must have been brought out and utilised in some other way. There can be, as I think, no sort of doubt as to *how* this was done: the workman, in whatever material he worked, commenced as he ended on that—e.g., the stone-carver learnt to carve and draw in the stone itself, and thus worked out a result even in the very act of learning his trade. That it is a subject of great difficulty and must wait for the future none can doubt; but, considering the universality of the present system, I have thought it but fair, to an all-but-forgotten idea, to remind your readers in the art world of it.—I am, &c., C. BRUCE ALLEN.

BRIGHTON CLOCK-TOWER.

SIR,—If any of your numerous readers have, like myself, sent for particulars of the above competition, they may perhaps be interested in the inclosed reply, if you can find room for it. It seems to me high time that architects should decline to have anything to do with competitions *on any terms whatever*.—I am, &c.,

W. S.

COPY OF LETTER TO THE BRIGHTON TOWN CLERK.

SIR,—I beg to thank you for sending me particulars of the proposed clock-tower competition.

I must say that I am astonished at the consummate impudence of the town council in issuing such a proposal to the profession, and still more at the fact that architects can be fools enough to send in designs on such preposterous conditions.

You coolly ask not only for complete working drawings and specifications (each set of which are worth their 5 per cent.), but for a detailed estimate, which involves taking off the quantities and pricing them out (a labour which alone is worth 2½ per cent. each set); and for the whole of the sets sent in you offer in payment altogether a beggarly sum of £45, which would not pay for one set of properly-made drawings without the quantities.

Moreover, you do not appoint any known competent person referee, and you have the additional meanness to stipulate that if a premiated design be carried out, the twopenny premium shall be merged in the commission. I wish the competitors joy of their job! They will richly deserve the reward they will get.—Yours,

VERY DISGUSTEDLY.

"DE REBUS GESTIS ET QUIBUSDAM ALIIS."

SIR,—The excellent letter from Mr. Buchan in your issue of 28th inst., is a valuable contribution to the clearing up of the vexed question of inside or outside soil-pipes. One solid fact, backed by common-sense and practical knowledge, is worth a bushel of theory, and I apprehend if architects and engineers, in conjunction with reliable and competent tradesmen, continue to approach the question in the spirit of your correspondent, they, with the general public, may safely leave the scientists and other amiable, but withal crotchety, enthusiasts, to speculate over, and fight out the "Battle of Stinks" to their hearts' content. Within the past few days on one of my own works (an alteration of an old house) where I had occasion to order the removal of a defective internal lead soil-pipe, and refixing a new one externally with the "Norman Shaw" open hopper arrangement, the w.c. was frozen up with the soil-pipe during one of the severest nights of the recent storm. It is true the bath and lavatory wastes emptied into the same hopper, and were the primary cause of the mischief, but I doubt not in their absence the same result would have followed. At the foot of this lead soil-pipe I had one of Mr. Buchan's excellent ventilating traps according to my usual custom, and it was was frozen up also. The situation, on the top of a hill, was unusually bleak and exposed. I have ordered the removal of the open hopper, and the running up of an iron ventilating pipe above the roof level, and the soil-pipe is to be cased with wood, packed inside with slag wool or felting (an excellent non-conductor, by the way). As to the freezing of the Buchan's trap, I have reason to believe the frosty wind from a brook at the foot of the hill into which the drain emptied had access up the length of it, as the drain was partially frozen up at the mouth.

I should like to hear from some of your correspondents if, after all, it is quite clear that a properly fixed internal soil-pipe is not, under certain conditions, better so fixed.

From traps and soil-pipes to the new font about to be presented to our old parish church by the Sheffield Freemasons, is a long step. Your correspondent, Mr. H. Hems, with whose racy letters all readers of the BUILDING NEWS are familiar, only tells half the story when he alludes to my firm keeping clear of the font competition, out of consideration for the architects employed on the church restoration. That had something to do with our decision, but the primary reason was the degrading and undignified nature of such competitions which are demoralising the profession daily, and ought, with their promoters, to be contemptuously disregarded by all architects of even average practice. If such are short of work, let them fill up their own spare time, and that of their pupils and assistants, by measuring and carefully studying the nearest old work, as the writer has done many a day with advantage and satisfaction, while, per contra, he has once or twice before now reaped failure and consequent tribulations of spirit, not to say loss of pocket, from unsuccessful competitions, and as to benefit of any kind, echo answers "Where?"

One word in reply to Mr. Hems and his complimentary allusion to our works. I have these five or six years been flattering myself that our work was gradually but surely casting itself loose from all sympathy with most of the "Gothic revival work" of these 25 years past. "Clever" it is not, nor I hope ever will be, in the sense that 99 per cent. of what is usually termed "clever Gothic" earns the sobriquet.

They say, "De Mortuis nil nisi bonum"; but Rotheram Church reminds me that long before I joined the Society for the Protection of Ancient Buildings, I had a grudge against the late Sir G. G. Scott for his destruction of the old east window, with its quaint transomed lights and capital arrangement of glass space. The restored church as a result has lost scale, and got a "clever modern Gothic" window, with glass to match, by, doubtless, some eminent art firm, and crowded into it is more "clever" design and drawing than probably could be seen in the Mediæval glass of the entire church.

I have a respect for our good friend Mr. J. P. Seddon; but why on earth did not he design his font on the lines of the old one, or, for that matter, several local ones of the same date, and put thereon the old cover? Let us hope he has not ventured on a second "clever Gothic" addition to the glorious old church.—I am, &c.,

CHARLES HADFIELD.

Corn Exchange Chambers, Sheffield, Jan. 31.

MODERN DOMESTIC ARCHITECTURE.

SIR,—Where has "Delta" been looking if he cannot see that, for the last three hundred years and until quite lately, we and other European nations have been doing little else than "endeavouring to revive Greek art"?—the outcome of which effort is the eternally reiterated Corinthian capitals and Classic mouldings which line miles of streets in Belgravia, Kensington, and compose the whole of such wearisomely ugly cities—even if only for their very monotony—as Glasgow and Berlin, and of which everyone, who dares to admire what really pleases him and not what he is told by pedants is correct, is so heartily nauseated with?

It is perfectly plain that "Delta" is not one of these persons, else he would not talk about the Greek style being the noblest of all, when, as a matter of fact, it is one of the most rudimentary and unscientific—its beauty arising merely from the good taste shown in the working out of its simple construction. Certainly, if we are to throw away all the scientific and æsthetic experience we have gained from the last two thousand years, we can call ours "high art," which "Delta" so desires, but evidently does not understand.—I am, &c.,

E. A. PHIPSON.

HOUSE SANITATION.

SIR,—I beg to support Dr. Corfield in his assertion, on page 113, that "a person who is not practised in carrying out sanitary works is not competent to put his own house in order; that no amount of reading can give that practice."

I might mention a case in my own experience where a F.R.S., who was well read up in the subject and could lecture well upon it, tried it; but somehow he could not get on at all, the details bothered him, &c. He then came to me and I planned out the work with him at once, and as the workmen he had were rather inexperienced he got my foreman to look over them, while at same time doing the particular parts, and as a consequence, his mind was at once set at rest, and we have been friends ever since. So there is some truth in the proverb that "an ounce of practice is worth a pound of theory." It is better to have *both*, however.—I am, &c.,

W. P. BUCHAN, F.S.Sc. (Lond.), &c.,
Sanitary Engineer.

Glasgow, January 31.

THE WEATHER AND THE BUILDERS.

SIR,—In your article of 28 January, under the above heading, you describe Mr. Latimer Clark's suggestion to permit of the ready flow of water from melted snow in gutters. Will you allow me to point out that a serious objection to an inverted V trough is that its removal would be necessitated every time a man had to pass along the gutter to repair a broken slate, and, irrespective of the inconvenience of this, the trough itself would sure to be damaged by carelessness, to say nothing of slates being broken in its removal. A very simple means of gaining the desired end is to construct "snow boards" in convenient lengths for handling, with 3in. by 1½in. deal laths, laid ½in. apart on bearers, say 4in. deep, shaped on the lower edge, spaced at intervals of say 2ft. 6in. The snow rests on top, and as it melts drains through between the laths and the water runs freely away. These "boards" in no way interfere with traffic over the gutters, for repairs to roof, &c., they protect the metal both from sun and "hob-nails," and if they are painted every few years they will last a very long time. I have only to add that all "outlets" from gutters should, of course, be covered with domical wire or other gratings to prevent the stoppage of the pipe by leaves, &c.—I am, &c ,

EDWIN T. HALL, A.R.I.B.A.

57, Moorgate-street, E.C.

EXTERNAL SOIL-PIPES.

SIR,—Mr. Buchan asks for opinions on this subject. I hope he will give some explanation of his assertion that "a soil-pipe placed outside *generates and discharges into the air* far less sewage-gas than one fitted up inside."

He can hardly be speaking of an inside *unventilated* soil-pipe, which would discharge its gas through the trap, or otherwise, *into the house*. And if ventilated, why *should* it generate more gas if fixed externally?

If a pipe be fixed inside, and kept warm by the heat of the house, a permanent ventilation upwards is much more probable than if its external surface be chilled by the night-air. And on this account also a stoneware pipe is better than metal, especially iron. And it is less liable to get frozen. But there is no reason why it should not be protected, if external, by a casing of brickwork. During the recent frost, I have not found anything but a strong upward draught through my soil-pipe, which is not merely internal, but isolated within a larger ventilated pipe, through which, also, the upward draught is equally strong and constant.

Outside a neighbouring house I observed an external soil-pipe coated with ice for about 20ft. from the area, and surrounded with a strong fire at the foot, in a vain attempt to thaw it.—I am, &c., WILLIAM WHITE, F.S.A.

Wimpole-street.

FIGURES IN GLOUCESTER CATHEDRAL.

SIR,—The statement that the very beautiful groups and figures in the Gloucester reredos are—like the panels on the lower part of the Temple Bar scarecrow!—of plaster, is incorrect. The sculpture in question, like the rest of the reredos, is of fine Painswick stone, from the Cooper's-hill quarries. They are the work of that talented sculptor Mr. William Redfearn, of Upper Kennington-lane, London, whose early death a few years ago, all of us who knew him, as well as a wide field outside that circle, so deeply deplored.—I am, &c., HARRY HEMS.

Exeter, Jan. 29.

PROPOSED VISIT TO ROME.

SIR,—By some misunderstanding, the total cost of this visit, which I brought to the notice of the Architectural Association on the 21st ult., is given in your report as varying from £21 10s. to £25 15s. These figures should be £16 to £18, according to the route chosen.—I am, &c.

THOS. BLASHILL.

NEWBURY GRAMMAR-SCHOOL COMPETITION.

SIR,—It may be well to warn competing architects against a piece of carelessness of which we have been the victims. A carefully-drawn pen-and-ink perspective view of our design was not unpacked until after the award had been made and the drawings criticised by the reviewers. This would have remained unknown to us, had we not gone down on Monday last to see the drawings, and remarked its absence.

We are aware this would not have influenced the award, with which we fully agree; but the object of the view, to call attention to the plans, was entirely lost.—We are, &c.,

Feb. 3rd. A OUTRANCE.

Intercommunication.

QUESTIONS.

[6382.]—**Gas-Stoves.**—Will some of your numerous readers kindly give their opinion on the question of having gas-stoves instead of the ordinary fire grate in rooms throughout a house which has no special ventilation provided, and if, in their opinion, they are dangerous to health? A few days since three gentlemen fainted from sitting in a room for some hours where a gas-stove and many gas-lights were burning, and no special ventilation provided. Information on the subject will greatly oblige—J. W. W.

[6383.]—**Condensation of Windows.**—Can any reader oblige by stating from experience how to clear windows of a corner grocer's shop one side, one end plate-glass, 7ft. high? Shop 9ft. pitch, 25ft. by 16ft., entrance at corner.—X. Y. Z.

[6384.]—**Nett Measurement.**—What is nett measurement? In the measurement of granite ashlar for caisson grooves in dock-work, does it mean that the groove (about 1ft. 6in. by 1ft. 10in.) is to be deducted from the cubic quantity of the granite?—F.

[6385.]—**French Polishing.**—When sending mahogany joinery work out into building to fix before polishing, is it usual to rub in anything to keep stain and grain from rising? I am told to use linseed oil by one, and by another that if I do so the polish will not take.—ENQUIRER.

[6386.]—**Electric Bells.**—About June, 1880, I had 18 electric bells fixed in my house, all acting properly for 3 or 4 months. In rooms where there are two pushes both will act on being touched, whilst in the course of the day one or both will not act at all, and the like in the bedrooms. Some work right one day, and the next will not act. Can any kind reader of this journal explain the cause and remedy to correct the evil, and oblige? The battery is properly charged, or thought to be so.—A SUBSCRIBER.

[6387.]—**Deposit on Quantities.**—How should I act with an architect who is too mean to return the deposit money on a bill of quantities, although he has been asked for it several times? I am referring now to a case in which I have receipt for the deposit and a memo. stating that it will be returned on receipt of tender. Tender was sent in on form provided in the ordinary way, and was below the average of the list, and it is not disputed that it was bonâ-fide. I may also say that the contract has since been let and the work commenced. This instance is not a solitary one, unfortunately, as I could name several architects, some of them with good practice, who will not disgorge without considerable pressure.—BUILDER.

[6388.]—**Quantities.**—In the case of quantities for work being taken out by a quantity surveyor, is it usual and proper for the architect to divide (or receive any part of the fee for quantities), the architect being put to some amount of trouble in negotiating with the surveyor and explaining drawings and specifications, &c.?—AN ARCHITECT.

REPLIES.

[6324.]—**Norman Woodwork.**—The doubts I expressed (Dec. 10, 1880) as to the existence of Norman woodwork in this country seem to receive confirmation by the inability of any reader to give a satisfactory instance of known work of that period. The good rector of Priston, near Bath (Rev. T. H. Hillier), however, writing me a few days ago, says:—"You say you have never seen any genuine Norman woodwork. I should like you to come here and see a grand Norman door in Priston Church. Some years ago Mr. Birlescombe, then the late Sir G. Gilbert Scott's chief assistant, assured me that this door was really Norman, both as regards the wood and the ironwork." I happened to receive this letter at Macclesfield, when in company with Mr. James Stevens, F.R.I.B.A., the well-known architect of Manchester. "I remember," remarked Mr. Stevens, upon my showing it him, "that many years ago Sir Gilbert and I were both with a large archæological party who took this part of Cheshire for a ramble. We were at an old church near here, and Mr. Scott—it was long enough before he was knighted—read a paper thereon. Amongst the features of especial interest which he pointed out was an old door, the woodwork of which he defined as Norman. He called particular attention to the sturdy excellence of the work, but whilst we were all examining it intently, an old villager, who had hobbled in amongst us unnoticed, remarked, "'Cuse me, meister, I knows nought about Norman, or any of them men you've been a mentioning, but I knows you makes a mistake about that there door. It wern't no one called Norman as made it. It were wrought by my grandfather, who were a wheel-wright in t'village. I've heard my old father speak on it many a time." I shall feel very interested in learning whether any real Norman woodwork does exist anywhere.—HARRY HEMS.

[6362.]—**Damp Walls.**—The damp which you observe comes out of the vapour of the atmosphere, and not out of the object on which it forms. During the fall of temperature the air gets cooled down to its "dew-point"—*i.e.*, the temperature at which condensation takes place—the atmosphere then, being unable to contain its moisture, deposits it on the hard cold surface of the varnished paper. The same effect may be observed on bringing a tumbler of cold water into a hot room, when its surface will get covered with a mist. Your best remedy would be to place a stove in your hall, as it would tend to keep the atmosphere at a constant temperature.—H. S., Belfast.

[6362.]—**Damp Walls.**—The complaint "M. G. C." makes is entirely due to the condensation of the moisture or, rather, of the air in the house, which the varnished paper arrests while the colour-washed walls above absorb. It is a defect few houses are exempt from, and the only way of remedying the evil is to warm the hall by a gas or porcelain stove, or a hot-water coil, and well ventilated by a louvre or exhaust ventilator at the top of staircase. One of Boyle and Son's ventilators would answer. Condensed moisture rendered visible in this manner is not so detrimental to health as walls that absorb the moisture both from within and without, but which do not show it. A damp-proof course would be of use in checking the rising of moisture from the ground, but would not cure the evil complained of, which is due to condensation, and not percolation from the outside, and it is only hard, smooth, and impermeable surfaces which are subject to the complaint.—G. H. G.

[6363.]—**Choir Stalls.**—In reply to "V. M.," and also in correction of Mr. F. J. Freeman, the westernmost stalls in St. Pete.'s church, Derby, are canted towards N.E. and S.E. respectively.—F.

[6367.]—**Frost Prevention.**—One of the contrivances alluded to for preventing the bursting of pipes consists in placing in those portions of pipes exposed to cold or draughts small tubes of gutta-percha or india-rubber, sealed at the ends, which can be fixed at the points by wire. The expansion of the water or ice is thus compensated for. Another plan is to leave the tap slightly open, so that a trickle of water may be maintained. A safer plan consists in emptying the pipes and cisterns, and to have an outside stop cock so as to draw directly from the main when water is wanted. These precautions are not always practicable. To thaw pipes, cloths dipped in hot water may be applied to the frozen or exposed parts. A very easy means of ascertaining whether a boiler is safe before lighting fire is to draw off some water. If it can be drawn there is little fear of explosion.—G. H. G.

[6369.]—**Thrust of Vault.**—The method described by "S. M." is approximate, and may be considered true for vaults of small span. The weight in one compartment means the weight comprised between the two piers, or the space included between the four points of support of the diagonal ribs. Of course, the thrust acts along the diagonal rib or groin. The rule, it is hardly necessary to say, does not apply to common cylindrical vaults.—G. H. G.

[6374.]—**Jacobean and Queen Anne Styles.**—I cannot refer "J. S." to any inexpensive books treating of these styles, the simple fact being that no one has published any book treating of the details. Mr. Stevenson's recent work on Domestic Architecture deals with the style generally, but does not enter into details. I can only refer "J. S." to the illustrations of the BUILDING NEWS, which contain numerous examples, and the works on furniture that have appeared from time to time. As Jacobean and Queen Anne are really based on Classic and Gothic types, "J. S." had far better study these; he would then be commencing at the purer sources of the styles which go under these names, for he may rest assured the public are beginning to tire of grotesque exaggerations and caricatured features, and that a reaction must come sooner or later. By the way, there is an old book, out of print now, but likely to be obtained from second-hand booksellers, called Hunt's "Exemplars of Architecture," which gives examples of a few old buildings of the reigns of the Jameses.—G. H. G.

[6375.]—**Asphalte Paths.**—I should advise "Asphaltos" to prepare a good dry surface of concrete before laying the asphalte. The material may be spread in two layers, but one layer of ¾in. thick would be best for footpaths. Claridge's asphalte is well suited for the purpose, and directions may be obtained of the secretary in Surrey-street. Directions for fusing the asphalte are given in the article "Asphalte," in "Commonplace Column," Vol. XXXIV., p. 277, where the subject is treated pretty fully.—G. H. G.

[6377.]—**Incline.**—The trucks with the wheels of 9in. diameter will require the greater power to work in the proportion of 2 to 1, or the proportion of power to weight is in the ratio of the radii of the two wheels on the assumption, of course, that the trucks are of equal weight, and the direction of force is parallel to the plane.—G. H. G.

[6378.]—**Cantilever.**—If the ends of cantilevers were not fixed securely and the vertical strut was loosely connected, the effect would not be equal to a cantilever of double the strength; if the frame was rigidly fixed at A and C, little increased strength would be derived, as the timbers are in the worst position to take the strain. If C D was a raking strut, the effect would be considerably increased.—G.

[6379.]—**Papering New Walls.**—Rendering in Portland cement and sand, and a setting of Keene's cement is a good preparation for immediate papering, though if the walls are at all damp, or are exposed to a wet quarter, I should advise waiting a short time. There is a kind of tin-foil sold which can be fixed to the wall

before papering, and which prevents the damp coming through. Any respectable decorator would be able to supply it, and I think upon this there would be little risk of damp showing.—G. H. G.

[6379.]—**Papering New Walls.**—If "X. Y. Z." does the work carefully as he says, being particular to use clean sharp sand, free from saline or loamy matter, he cannot do better. The finishing coat may be either Keene's or Parian cement. Before papering, the surface should have a coat of paint prepared, as painters call it, "sharp colour."—Old Builder.

[6379.]—**Papering New Walls.**—I should not like to risk a *good* paper on new work, such as "X. Y. Z." suggests, and would advise him to adopt either boarding or canvas, or a process that was introduced to me some time since, by which the patentee promised to enable such work as "X. Y. Z." requires to be done. I should like to know if the process is working now, and where the same can be obtained. It was called, if I remember rightly, Atkinson's or Hitchings Rapid Slab Plastering. The slabs of plaster were sold dry, and were to be fixed with nails, over which paperhanging or colour could be put at once.—T. W. S.

STAINED GLASS.

Farnham.—A stained-glass window has been placed in the south aisle of Farnham parish church, in memory of the late Dr. J. S. Utterton, suffragan Bishop of Guildford. The window is of three lights. In the centre is the figure of Our Lord as the Shepherd and Bishop of Souls, and beneath it the Parable of the Talents. In the right-hand light is a figure of St. Barnabas, and underneath he is represented as laying the price of the land at the Apostles' feet. On the left light is St. Paul, and beneath it he is depicted as preaching at Athens. The work has been executed by Messrs. Powell and Sons, of Whitefriars, London.

Our Office Table.

At a general assembly of the Royal Academy held last Friday evening, Messrs John Brett, painter; Andrew Gow, painter; and William Burges, architect, were elected Associates of the Royal Academy. We especially congratulate the Royal Academy on the last-mentioned election; and we trust that at the earliest possible date, Mr. Burges may take his proper place among the Royal Academicians.

Prince Leopold presided last week at the first meeting of the Kyrle Society, which was held in the Kensington Town Hall. There was a large attendance, including the Princess Louise and Sir Frederick Leighton. Prince Leopold made an earnest appeal to all, in order that a love of beautiful things might be diffused among the poor. Amongst the objects of the Society were the preservation of open spaces, the laying out of open spaces as gardens for the public, the formation of choirs to give concerts to the poor, decorations by mural paintings, and the gifts of flowers. The objects of the Society were warmly approved.

Mr. James Miln, known to the literary and archæological world by his important work, published in 1877, entitled "Excavations at Carnac," died last week. In the summer of 1873, Mr. Miln went on a tour to Brittany. When visiting the celebrated alignments of standing stones around Carnac, his attention was drawn to a series of mounds at the Bossenno, which he determined to investigate. His operations extended over the next three years, and resulted in the discovery of a Gallo-Roman settlement, consisting of a villa of eleven rooms, surrounded by a number of other buildings, including a bath and a small temple, which seemed to have been occupied for a considerable period prior to the middle of the fourth century, when they had probably been destroyed by fire. The results of these investigations were embodied in the work already mentioned, which was issued almost simultaneously at Edinburgh and at Paris. Returning to Carnac in 1877 he continued his researches, and having at length finished the text and illustrations for the first of a series of new works in which he intended to embody the results of his last three years' excavations, he came to Edinburgh at Christmas to see it through the press. During the few intervening weeks he worked incessantly, and had completed the revision of the proof-sheets the day before he was seized with his short and fatal illness.

Considerable progress has been made with the arrangements for the London International Medical and Sanitary Exhibition, 1881, and since the publication of the first list of the Guarantee Fund, the following additions have been received:—Messrs. Burroughs, Welcome, and Co., £30; Robert Rawlinson, Esq., C.B., £25; Sir James Paget, Bart., F.R.S., £10 10s.; T. C. Smith, Esq. (Hull), £10, Messrs. Strode and Co., £10; Messrs. Woollams and Co., £5 5s.; John Carter, Esq., £5; Messrs Mayer and Meltzer, £5; W. A. Meredith, Esq., £5; The Sanitary Engineering Company, £5; Daniel T. Bostel, Esq. (Brighton), £3; William Martindale, Esq., £2; Albert E. Fraedelle, Esq., £1 1s.; and Messrs. Walter Macfarlane and Co., £25. In addition to the medical and sanitary sections there will be a miscellaneous section, consisting of school furniture and other articles more or less connected with the general purpose of the exhibition. Applications for space are to be sent in not later than Thursday, March 31st, 1881, but from India, the Colonies, and America, applications will be received up to April 15. Full particulars may be had on application to the secretary, Mr. Mark H. Judge, Parkes Museum of Hygiene, Gower-street.

On Wednesday evening, the 26th ult., a soirée was given by Messrs. Watt and Wilson, contractors for Lord Bute's new mansion, now in course of erection at Mount Stuart, Bute, to the men employed on the works. The company numbered about 200, and the chair was occupied by Mr. J. Windsor Stuart, factor for the Bute estate. The occasion was the opening of a recreation-hall, which has been built at Lord Bute's expense, for the workmen, who, situated as they are, about five miles from Rothesay, the nearest town, are in a somewhat isolated position, and such a hall will supply a much-felt want. At the close of the proceedings, amongst other votes of thanks, one was enthusiastically accorded to his lordship for his generosity in providing the new hall.

The sixth half-yearly report and balance sheet of the National Association of Master Builders of Great Britain have just been issued. It is reported that since the last meeting the National Association of Master Builders of Scotland and the Builders' Association of Weston-super-Mare have joined this Association, bringing the total number of affiliated societies up to 49. The council regret to find, from statements submitted to them, that there is still great depression in trade, with very little prospect of improvement, and in every town there is a much larger number of men seeking employment than is required. The only alterations in the working rules or rates of wages, which were pending when this report was issued, on the 23rd Jan., were the following: Birmingham—Notice has been received for advance of ¾d. per hour from the operative carpenters; and from bricklayers for ½d. per hour, together with an alteration in the rules. Bolton—The master builders gave 6 months' notice to masons that their wages would be reduced 1d. per hour from the 7th May next, and they have received a counter notice asking for an advance of ¾d.; this notice given by the employers to the operative masons is simply to reduce the wages to the same rate as that which is being paid in Manchester, which is only 10 miles distant. Manchester—Notice has been given by the employers to revise the plasterers' rules. With reference to clause 23 in the "Highways and Locomotive Amendment Act of 1878," whereby many contractors have been made liable for repairs to the road when the surveyor of the district has considered that they had extraordinary traffic thereon, the solicitor of the association has pointed out that a builder is not bound to pay whatever a surveyor may demand but has a right to refuse until the surveyor has proved, to the satisfaction of the court for the district, that the damage has been done, and the person alleged to have done the damage to the road by the extraordinary traffic may bring before the court evidence to the contrary if he thinks the amount unjustifiably high. The balance-sheet shows total receipts from all sources of £411 11s. 3d., and the balance in hand which in July was £329 8s. 10d., has been reduced to £187 9s.

The Bishop of Worcester presided over a meeting held on Tuesday in the Town-hall, Stratford-on-Avon, to consider what steps should be taken for the restoration and improvement of the parish-church, celebrated as the burial-place of Shakespeare. The Marquis of Hertford proposed "That, in the opinion of this meeting, the present condition of Stratford-on-Avon Church renders it desirable that steps should be taken to make it more worthy of the great purposes to which it is devoted." In the course of his remarks his lordship said, although he was pleased to take part in the proceedings, yet he felt compelled to enter his protest against the project being initiated at such an inopportune time as the present. However, there was no reason why a beginning should not be made now, although it was impossible to make much progress until times improved. His lordship, in conclusion, said if it was proposed to interfere with that beautiful spire, he, for one, would have nothing to do with the project. Mr. S. E. Shirley, of Eatington Park, seconded the resolution, stating that in the hands of the eminent architect who had been called in the work of restoration might be safely left. Mr. C. E. Flower (ex-mayor of Stratford) proposed, as an amendment, "That this meeting do now adjourn until this day three months, to enable the parishioners of Stratford to assemble in public meeting and discuss the present state of the parish church, form a representative committee, and report the result of their deliberation." Mr. E. Gibbs seconded the amendment, and referred at some length to the extensive and costly restoration effected 40 years ago. As an architect, and one who was concerned in the carrying out of the former work, he denied that the fabric was in need of attention. It had had spent upon it during the time named as much as £10,000. The mayor of Stratford (Alderman Cox) supported the amendment. The bishop then put the amendment to the meeting, when a very large number of hands were held up in its favour. On the contrary being put, only a few persons in the body of the hall voted for it, apart from the clergymen and others on the platform. His lordship declared the amendment carried by a very large majority. The meeting then became somewhat lively. An effort was then made, amid considerable excitement, to appoint a committee; but it was strongly opposed by the great majority of those present, and the meeting broke up in some disorder, the vicar expressing a determination to go on with the work.

Throat Irritation.—Soreness and dryness, tickling and irritation, inducing cough and affecting the voice. For these symptoms use Epps's Glycerine Jujubes. Glycerine, in these agreeable confections, being in proximity to the glands at the moment they are excited by the act of sucking, becomes actively healing. Sold only in boxes, 7½d. and 1s. 1½d., labelled "James Epps and Co., Homœopathic Chemists, London." A letter received: "Gentlemen,—It may, perhaps, interest you to know that, after an extended trial, I have found your glycerine Jujubes of considerable benefit (with or without medical treatment) in almost all forms of throat disease. They soften and clear the voice. In no case can they do any harm.—Yours faithfully, Gordon Holmes, L.R.C.P.E., Senior Physician to the Municipal Throat and Ear Infirmary."

Holloway's Pills.—These famous Pills purify the blood, and act most powerfully, yet soothingly, on the liver, stomach, kidneys, and bowels, giving tone, energy, and vigour to the whole system. They are wonderfully efficacious in all ailments incidental to females, and, as a general family medicine, are unequalled.

CHIPS.

On Wednesday evening, January 26, Mr. Richard J. Collier, of 28, Finsbury-pavement, offered for sale by auction, at the Chequers Inn, Marsh-street, the Black Horse Lane Estate. Notwithstanding the inclement weather, there was a fair attendance of buyers, and about three-fourths of the estate was soon disposed of, the sales amounting to £7,172, and as Mr. Collier has since sold several lots by private treaty, there is no doubt but that purchasers for the remaining portion will soon be found.

A special meeting of the Sanitary Committee of the Hull Corporation was held on Wednesday week, to receive a report from Mr. F. Sharp, borough engineer, on the interruption to the outward flow of the sewage. It was stated in the report that, owing to the increase of population, especially in the western district, the accumulation of backwater between tides was steadily increasing, and that it had become necessary, in order to prevent the generation of gases, to establish pumping engines; looking to the fact that the necessity for relief was even greater in Newington than in Hull, it was desirable to have one pumping-station for the two districts, the estimated first cost being £12,000. It was decided to forward the report to the local boards of the adjacent districts of Newington and Cottingham, in order to obtain their co-operation.

The Tewkesbury local board of health last week resolved to purchase the entire undertaking of the Tewkesbury Gas Company, at the price of £15,000, subject to the approval of the ratepayers, and the consent of the Local Government Board.

A clock, with a single black dial and gilt figures, and a peal of three bells chiming the hours and

quarters, have just been placed in the tower of Froxfield Church, near Petersfield. They were supplied by Mr. J. W. Benson, of Ludgate-hill, E.C.

Two new schools are in course of completion for the Swindon School Board, and will shortly be opened. Those in Sanford-street are being built by Messrs. Jones and Co., and the contractors for the Westcott-street schools are Messrs. Forse and Astley.

Mr. T. J. Elliott, resident agent of the Southwick Park Estate, Hants, has been appointed Professor of Estate Management at the Royal Agricultural College, Cirencester.

The officers of the Royal Engineers propose to erect a memorial stained-glass window in Rochester Cathedral in remembrance of their comrades who fell in the Zulu and Afghan wars.

Plans by Mr. W. St. John H. Hancock were submitted to the Bognor Local Board, last week, of an estate known as Brooklands, on which it is proposed to erect 300 dwelling-houses, and also summer and winter gardens, baths, a pier, &c.

A new post-office is about to be erected at Neath, South Wales, from designs by Messrs. Lean and Hooley, architects, of that town. It will be Modern Italian in style, and will be situate at the corner of Wind-street and Church-place; the street frontages will be of native polled stone, with Bridgend stone dressings.

The iron viaduct across the Solway, on the Solway Junction Railway, near Annan, was seriously damaged on Sunday by large masses of ice coming down from the Esk and the Eden. Many of the pillars have been broken, and further damage has since occurred. As the line is closed for traffic on Sundays, there was no accident. The bridge is a mile and a quarter in length, is constructed of pillars and girders, and was completed in 1867.

A special meeting in quarter-session of the Devonshire magistrates was held on Friday, to receive the report of a committee appointed to consider the manner in which the county surveyor had discharged his duties. The committee announced the reception of the resignation of the surveyor, and it was decided, before making a new appointment, to consider the duties of the office with regard to the advisability or otherwise of appointing two county surveyors instead of one.

The town council of Grimsby adopted, on the 19th ult., a scheme and plans prepared by the borough engineer for the main drainage of the town, and also of the adjacent urban sanitary district of Clee-with-Weelsley. The estimated cost of the scheme is £7,554 for the Grimsby portion, and £1,667 for the Clee portion.

The vestry of Kensington have raised the salaries of their surveyor, Mr. Weaver, from £600 to £700 per annum, and of their medical officer of health, Dr. T. Orme Dudfield, from £500 to £600.

A new mission church of St. Ambrose, was opened at Pendleton, near Manchester, on Sunday. It is Gothic in style, and is built of brick, with terra-cotta stringcourses and copings. It consists of chancel, nave, and south aisle, measures 70ft. by 28ft., and seats 380 persons. The principal roof is of pitch-pine, and is open to the collar-beam; the seats, chancel-screen, and other fittings are also of pitch-pine. Mr. Henry Lord, of Manchester, is the architect.

A fire occurred on Saturday morning on the premises of Messrs. Weaver and Green, builders, of New Wharf-road, Caledonian-road, N., and resulted in the destruction of the upper portion of a building 40ft. by 20ft. used as workshops.

The parish-church of St. Michael, Highgate, was reopened on Saturday, after undergoing enlargement, reseating, and improvements in ventilation and warming, at a cost of £3,000.

An inquiry was held at Bolton, before Mr. Arnold Taylor, one of the inspectors of the Local Government Board, on Friday, into an application from the town-council for sanction to borrow £300,000 for street improvements and works of sewerage. Mr. J. Proctor, borough surveyor, explained the details of the works, some of which have already been partially carried out.

A chancel-screen has just been erected in the parish-church of Norton-sub-Hamdon. It is of wrought iron, on stone base, and stands 13ft. high; it is gilded in parts, and painted maroon and black. Mr. A. W. Blomfield, M.A., of London, designed the screen, which was carried out under his superintendence by Messrs. Shrivell and Co., of London. Messrs. Stansell, of Taunton, executed the decorations.

Mr. John Stones, of Ulverston, has fitted up the new banking premises at Stamford for the Northamptonshire Banking Co., described in our issue of 21st ult., with his curvilinear iron revolving shutters, worked by patent balance-weight motion.

The Royal Archæological Institute have been invited by the Mayor and Corporation of Bedford to make that town the centre for the present year's annual excursion.

The members of the architectural classes in the Brighton school of art, numbering about 45, paid, on Saturday afternoon, the first of a series of visits to building-works in progress; visiting, under the direction of the head-master, Mr. W. M. Alderton, the new children's hospital in Dyke-road. At the close, a vote of thanks was passed to Mr. Potter, the clerk of the works, who had explained the works.

The bridge trustees of Glasgow have received a report from Messrs. Bell and Miller, engineers, as to the condition of Glasgow-bridge. It is therein stated that every arch of the bridge is fractured, and that the fissures extend for 223ft. out of the 389ft. total span. These fractures, which extend along the centre line of the bridge, have been caused by the passage of weights much heavier than the bridge was originally intended in 1835 to bear; and further injury had been caused by the lowering of the river-bed. They recommended that no weights over 12 tons be allowed to cross the bridge, and that the footings and foundations be protected by throwing down bags of Portland cement concrete.

The lecture-hall connected with the Congregational chapel at Cliftonville, West Brighton, is about to be improved by the addition of a number of new class-rooms. These will form a new front to the street and will be built in Kentish rag to agree with the chapel. The plans are being prepared by Messrs. Holford, Clayton, and Black, architects, of Brighton.

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MEETINGS FOR THE ENSUING WEEK.

MONDAY.—London Institution. "Succession to Thrones." By Sir H. S. Maine. 5 p.m.
Society of Engineers. Presidential address by Charles Horsley, President for 1881. 7.30 p.m.
Institution of Surveyors. Discussion on "Rural Water Supply." 8 p.m.
Society of Arts. "Watchmaking." By E. Rigg, M.A. 8 p.m.

TUESDAY.—Institution of Civil Engineers. "The Portsmouth Dockyard Extension Works. Part II." By C. Colson, A.M.I.C.E. "The Plant and Temporary Works Used on the Portsmouth Dockyard Extension." By C. H. Meyer, A.M.I.C.E. 8 p.m.

WEDNESDAY.—Society of Arts. "The Present Condition of the Art of Wood-Carving in England." By J. Hungerford Allen. 8 p.m.
Sanitary Institute of Great Britain. "The Law in Relation to Sanitary Progress." By W. H. Michael, Q.C. 8 p.m.

THURSDAY.—London Institution. "The Castes and Trades of India." By Prof. Monier Williams. 7 p.m.
Society for the Fine Arts. "The Influence of Women Upon Art." By Mrs. Needham. 8 p.m.

FRIDAY.—Institution of Civil Engineers. "Internal Corrosion of Cast-Iron Pipes." By M. Buchan Jamieson, Stud.Inst.C.E. 7 p.m.
Society of Arts. "Gold Fields of India." By Hyde Clarke. 8 p.m.
Royal Institution. "Distances of the Stars." By Prof. R. S. Ball. 9 p.m.

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TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender—it adds to the value of the information.

BERMONDSEY.—For the erection of a new hall at rear of No. 194, Southwark Park-road, S.E., for Mr. John Morgan. Mr. E. Crosse, architect, 6, Bermondsey-square, S.E. :—

White, S. (accepted)	£325 0 0

BRAY, Co. WICKLOW.—For piling works at the Esplanade, for the Bray township commissioners. Mr. Comber, surveyor :—

Brady, B. (accepted)	£160 0 0

BURY ST. EDMUNDS.—For the extension of the water-works, for the town council :—

Pontifex, Shoe-lane, London (accepted).

CARNARVONSHIRE.—For the re-erection of Ysgoldy chapel in the parish of Llanddeiniolen, for the Calvinistic Methodist Denomination. Mr. Richard Davies, architect, Bangor :—

Morris, O. O., Groeslon	£1,850 0 0
Jones, R., Carnarvon	1,597 0 0
Jones, H., Cwmyglo	1,487 0 0
Davies, E., Waenfawr	1,400 0 0
Williams, W., Holyhead	1,381 10 0
Williams, W. H., Clwt-y-Bont ...	1,345 0 0
Evans, D , Dolyddelen	1,310 0 0
Owens and Edwards, Caeathraw...	1,308 0 0
Jones, E., Groeslon...	1,300 0 0
Pritchard, W. & O., Llanfair P. G.	1,292 0 0
Williams, D. M., Cricieth ...	1,285 0 0
Williams, J., Bangor	1,250 0 0
Hughes, J., Carnarvon	1,237 0 0
Jones, D., Llanwnda	1,235 0 0
Jones, W., Penisarwaen	1,181 0 0
Williams, W. R., Portdinorwic ...	1,181 0 0
Williams, D., Carnarvon	1,178 0 0
Williams, R. & J., Upper Bangor*	1,158 0 0

* Accepted.

DEVONPORT.—For alterations to the premises of the Devonport Union Mill Society :—

Jinkin, T., Marlborough-street (accepted) ...	£375 0 0

DULWICH.—For works of sewerage at Goose-green, for the Camberwell vestry. Mr. Reynolds, surveyor :—

Smith, T. M.	£350 0 0
Harris, W.	169 10 0
Butler, G. (accepted)...	140 0 0

ISLEWORTH.—For the execution of road and sewer works at Isleworth, for the United Land Company (Limited) :—

Botterill	£3,735 0 0
Nowell and Robson...	3,108 0 0
Brooker	3,000 0 0
Acock	2,717 0 0
Bath and Blackmore	2,658 0 0
Dyer and Co....	2,593 0 0
McKenzie and Co.	2,560 0 0
Alldred...	2,470 0 0
Pizzey	2,380 0 0
Harris	2,370 0 0
Kempling	2,367 0 0
Coker	2,207 0 0
Ford and Co...	2,195 0 0
Brunsden	2,169 0 0
Gross and Paine	1,946 16 8
Seal, Bros.	1,835 0 0

KENSINGTON.—For the paving of the parish for the next three years, as per schedule of prices, for the Kensington vestry. Mr. Weaver, surveyor :—

Nowell and Robson (accepted).

LONDON.—For alterations and additions to No. 60, Curzon-street, Mayfair, W., for Mr. W. Widdicombe. Mr. William H. Collbran, architect :—

Scharien	£1,500 0 0
Bolding	1,179 0 0
Henderson (accepted)	1,097 12 0

LONDON.—For new floor to warehouse, Fulham-road, South Kensington, for J. Offord, Esq. Mr. William H. Collbran, architect :—

Toten and Sons	£411 0 0
Scharien...	395 0 0
Wilkins (accepted)	300 0 0

MAIDENHEAD.—For alterations and additions to the Ray Mead Hotel, for P. S. Langton, Esq. Messrs. Brown and Albury, architects :—

Littleton, Maidenhead	£632 0 0
Woodbridge, Maidenhead	569 0 0
Kingerlee, Banbury (accepted) ...	495 0 0

LONDON.—For the erection of residential chambers' "Gloucester Mansion," Harrington-gardens, South Kensington, for J. Offord, Esq. Mr. William H. Collbran, architect. Quantities supplied by Messrs. Strudwick and Mennie :—

				Hot water supply.		
Gibbs and Flew ...	£16,034	0	0	£363	0	0
Hall, Beddall, & Co...	15,580	0	0	390	0	0
Colls and Sons ...	15,370	0	0	310	0	0
McLachlan & Sons ...	15,098	0	0	354	0	0
Mowlem, J. and Co...	15,052	0	0	315	0	0
Brass, W.	14,866	0	0	272	0	0
Tarrant and Sons ...	14,592	0	0	187	0	0
Braid and Co. ...	14 586	0	0	220	0	0
Nightingale	13,801	0	0	270	0	0
Boyce, T.	13,658	0	0	220	0	0
Martin, Wells, & Co.*	12,725	0	0	175	0	0

* Accepted.

MAIDSTONE.—For warehouse, St. Peter-street, Maidstone, for Messrs. Youngman and Co. Mr. E. H. Stephens, F.R.I.B.A., architect, Maidstone :—

For foundations and general work :—

Callund and Son, Rochester ...	£1,320 0 0
Simmonds, Maidstone	1,273 0 0
Cox, Bros., Maidstone	1,245 0 0
Wallis and Clements, Maidstone	1,098 0 0
Avard, Maidstone	1,089 0 0
Vaughan, Bros., Maidstone ...	997 0 0
Naylar, Rochester	993 0 0

For ironwork :—

Naylar, Rochester	£663 0 0
Handyside and Co., Derby	613 0 0
Weeks and Son, Maidstone... ...	576 0 0
Balls, Garret, & Co., Maidstone ...	566 0 0
Dawnay, A. and Co., Cannon-st. ...	550 0 0
General Iron Foundry Co. (Limited) Thamcott	456 0 0

RAMSGATE.—For two houses, Queen-street, Ramsgate. Mr. Alfred R. Pite, architect, 44, Bloomsbury-square, W.C. Quantities by Mr. Rookwood :—

Faulkner	£2,748 0 0
Elgar	2,499 0 0
Wiles	2,473 0 0
Cowell	2,445 0 0
Shrubsole	2,388 0 0
Smith and Sons	2,315 0 0
Home	2,315 0 0
Paramor	2,310 0 0
Price and Richardson	2,290 0 0
Osborn...	2,289 0 0
Denne	2,275 0 0
Newby	2,211 0 0
Seal	2,195 0 0
Martin	2,152 0 0

READING.—For alterations and additions to Nos. 14, 15, and 16, Duke-street, for Messrs. Holbrook and Hall. Messrs. Brown and Albury, architects ;—

For first portion of works :—

Simonds, Reading	£2,085 0 0
Higgs ,, ...	1,950 0 0
Searle ,, ...	1,900 0 0
Woodroffe ,, ...	1,775 0 0
Denton ,, (accepted) ...	1,634 10 0

READING.—For the erection of offices, &c., in Blagrave-street, for R. Oakshott, Esq. Messrs. Brown and Albury, architects :—

Higgs, Reading	£2,591 0 0
Strong ,, ...	2,529 0 0
Simonds ,, ...	2,393 0 0
Shephard ,, ...	2,392 0 0
Searle ,, ...	2,374 0 0
East ,, ...	2,322 0 0
Denton ,, ...	2,209 0 0
Wernham ,, ...	2,187 7 0
Kingerlee, Banbury (accepted) ...	2,095 0 0

READING.—For the erection of new business premises, Redlands, for Mr. W. Shepherd. Messrs. Brown and Albury, architects :—

Wernham, Reading (accepted) ...	£1,600 0 0

READING.—For taking down and rebuilding "The Fox" publichouse, for Messrs. H. and G. Simonds. Messrs. Brown and Albury, architects :—

Wernham, Reading (accepted) ...	£1,396 10 0

READING.—For alterations to the Co-operative Society's stores, Caversham-road. Messrs. Brown and Albury, architects :—

Taylor, Reading (accepted)	£299 0 0

READING.—For the erection of new business premises in Broad-street, for Messrs. Thos. Reed and Son. Messrs. Brown and Albury, architects :—

Kingerlee, Banbury (accepted) ...	£1,195 0 0

STOKE NEWINGTON.—For erecting the first block of houses at Stamford-lane, for the Incorporated Society of Licensed Victuallers. Mr. H. I. Newton, architect, 27, Great George-street, Westminster. Quantities supplied :

Perkins...	£7,995 0 0
Lamble...	7,773 0 0
Anley	7,690 0 0
Langmead and Way	7,644 0 0
Cook	7,533 0 0
Stimpson and Co.	7,460 0 0
Beales	7,443 0 0
Hobern...	7,436 0 0
Nightingale	7,373 0 0
Grimwood and Sons	7,345 0 0
Crabb	7,261 0 0
Shurmur	7,245 0 0
Pickersgill	7,237 0 0
Godden	7,175 0 0
Sharp and Mills	6,830 0 0
Garrud...	6,783 0 0
Walker...	6,443 0 0
Mattock, Bros.	6,377 0 0
Smith	6,210 0 0
Wood, Hackney (accepted) ...	5,951 0 0

STOKE NEWINGTON.—For building four shops in High-street, Stoke Newington, for the Incorporated Society of Licensed Victuallers. Quantities supplied. Mr. H. I. Newton, architect, 27, Great George-street, Westminster :—

Anley	£5,800 0 0
Perkins...	5,672 0 0
Cook	5,533 0 0
Crabb	5,490 0 0
Hobern...	5,463 0 0
Lamble...	5,423 0 0
Langmead and Way	5,417 0 0
Nightingale	5,391 0 0
Grimwood and Sons	5,366 0 0
Pickersgill	5,363 0 0
Garrud	5,283 0 0
Godden	5,255 0 0
Walker	5,207 0 0
Shurmur	5,166 0 0
Beales	5,047 0 0
Stimpson and Co.	5,020 0 0
Smith	4,950 0 0
Sharp and Mills	4,810 0 0
Mattock Bros.	4,777 0 0
Wood, Hackney (accepted) ...	4,645 0 0

WELSHPOOL.—For additions and alterations to dwelling house, Salop-road, Welshpool, for Dr. Thomas Sowerby. Mr. R. Hurst, architect :—

Potter, J., Welshpool	£556 10 0
Pugh, C. T. ,, ...	535 0 0
Nevett, Bros., Ironbridge	500 0 0
Gethin, J., Shrewsbury	459 0 0
Bowdler, W. and Co., Shrewsbury	440 0 0
Jones, D., Welshpool (accepted) ...	428 0 0

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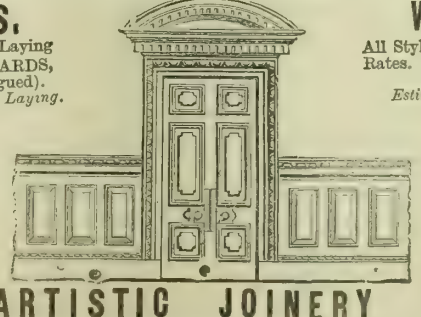

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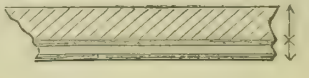

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THE BUILDING NEWS.

LONDON, FRIDAY, FEBRUARY 11, 1881.

COHESION.

IF we compare the principles on which ancient buildings have been constructed with those adopted in modern architecture, we find that in the former the resistance of the material to crushing was alone considered by the builders, while in the latter the cohesive strength or resistance to tearing asunder, has been brought into action as well as the crushing strength. Now since it happens that the power of resistance to crushing in stone or marble is always vastly superior to its cohesive strength, we find that many of the most ancient buildings, in which the former principle of construction has been adopted have stood until the present day, while works comparatively modern, in which the latter principle has predominated, and which from the nature of their construction have contained within them the elements of their own dissolution, are now often in a state bordering on ruin, and unless care is taken to preserve them will soon fall to pieces of their own accord. In the most ancient buildings, it was customary to use large blocks of carefully squared stone, which required little or no cementing material to keep them together, their own of weight sufficing to do so, and the strength the supporting columns or piers was always greatly in excess of what would suffice to carry the superincumbent loads.

With the introduction of the arch great changes took place in the modes of construction, small stones being employed instead of large ones, and cement between the beds and joints being relied on for keeping the stones in their places, and preserving the unity of the structure. And since the arch, from its very nature, is always trying to break itself up into its component parts, and doing its utmost to thrust out the walls of the buildings, it follows that the force of cohesion between the materials, by which the main parts of it are united together into one homogeneous mass, becomes an important matter for an architect's consideration.

When an arch breaks up it does so by the opening of the joints of its voussoirs, generally at three or four different points, and the force which causes this must be a tensile one, acting as it does against the cohesion of the material of which the arch is formed. Also when a wall is pushed over by the thrust of an arch or by any other force, it is the cohesion of the material that first yields to the strain, and the mass itself not being of sufficient weight to counteract the thrust by its own inertia, is overturned about its outer edge.

Cohesion may be defined as the attraction which all solid particles have for one another in accordance with the law of universal gravitation, by which every particle attracts every other particle in creation in direct proportion to its mass, and inversely as the square of the distance apart. A simple experiment will show the existence of this law, for if a small piece of wood is floated in the middle of a bowl of water, it will be found in a short time to have been attracted to the side of the vessel, and as often as we remove it therefrom, it will return to the side again. The cohesion between bodies which are brought in close contact with each other, increases in intensity also according to the time that they are left together undisturbed. Thus if two pieces of polished plate-glass perfectly clean are placed closely together, they will in a short time become so firmly attached as to render it a matter of some difficulty to separate them, and if left for a long period together undisturbed, it will be found easier to break the glass itself than to separate the two pieces at the joined surfaces, In this case, owing to the smoothness of the surfaces in contact, air is excluded, and the particles brought into the closest union.

In the construction of buildings, the materials used are always more or less rough on the surfaces to be united, and therefore will not unite of themselves, but require a cementing material to be interposed, which while attaching itself firmly to each surface, will itself possess as great cohesive strength as the materials it unites. In these cements it is found that time is an important element in the cohesive power which they attain; the cohesion of the cement when first used is generally but slight; but after a few days have elapsed, it is found that a considerable amount of force is necessary to separate the materials cemented together, and after some months have passed, it will often be found that the force necessary to break the cement will tear asunder the stone, brick or other material which it adheres to. Take, for example, the use of Portland cement for uniting two bricks together; if a cement of good quality and weighing 1cwt. or more per bushel is used "neat," to form the joint and kept under water for a month, it will require a force of 300lb. per square inch of surface to break the joint; if left for three months a force of 400lb. will be necessary; and if left for twelve months or more about 500lb. to 600lb. per square inch, will be required to tear asunder the cement. Now as the cohesive strength of ordinary brick is not generally more than 300lb. per inch, we see that the strain that would fracture the cement joint would be more than enough to tear asunder the bricks themselves. It is usual, therefore, to mix a considerable proportion of sand with Portland cement when employing it as a mortar, by which process its cohesion is very much diminished; thus the same cement as that mentioned above, when mixed with four times its bulk of sand is found to have a cohesive strength, after one month's immersion, of only 32lb. per square inch; after six months the strength is increased to 122lb.; and to 140lb. at the end of twelve months. If mixed with only twice its bulk of sand the cohesive strength at end of one month is 92lb. per inch, after six months it is 220lb., and at the end of twelve months the strength is 270lb., which is nearly equal to that of common brick itself, so that no great advantage is gained by using neat cement for ordinary brickwork, while an additional expense is incurred.

Cohesive strength may be considered as the diametrically opposite of crushing strength, which is the resistance of materials to the pressing more closely together of their particles, and in such materials as cement, stone, or brick is vastly greater than the cohesive strength or the power of resistance to the tearing asunder of the particles. Thus Portland cement which has been mixed with water and left to harden for a year or more, has a crushing strength of about three tons per square inch of section, while the cohesive strength is about 1-12th of this. In ordinary bricks also the resistance to crushing is five or six times the cohesive strength. In stone the force of cohesion between the particles is very variable, and but few experiments have been made to ascertain its amount with accuracy; but we find that Chilmark stone, whose resistance to crushing is 6,300lb. per inch, has a cohesive strength of only 500lb., while Craigleith stone, whose crushing strength is 7,800lb., can be torn asunder by a tensile force of only 450lb. per inch.

Slate is the only material that can be classed among stones in which the cohesive force is about equal to its crushing strength, being as much as from 9,000 to 12,000lb. per square inch of section.

The force of cohesion in mortar made with ordinary lime and sand varies so much according to the quality of the lime, that but little reliance can be placed on experiments with it; but there is no doubt that time is an important element in augmenting its cohesive power. The quantity of sand mixed with the lime also makes a considerable difference to the strength of the mortar; thus white chalk lime will not bear more than 3 times its bulk of sand, but if rendered "selenitic" by the addition of plaster of Paris, its greatest cohesive strength is attained with 5 times its bulk of sand; and the Burham lime, when rendered selenitic, has its maximum cohesion with 6 parts of sand; while Halkin lime made selenitic attains its greatest cohesive strength with only 4 parts of sand to one of lime. Roman cement, which is nearly as strong as Portland when used neat, is very much weakened by the admixture of sand, having little more cohesive strength than common mortar; its cohesion is, however, increased by time much in the same proportion as Portland cement.

Cements which are mixed with water in order to render them cohesive appear to require a certain amount of porosity in the materials to which they are applied in order to enable them to adhere to the surfaces, by which the water is partly absorbed before the cement is set, and the cementitious material becomes, to some extent, amalgamated with the stone or brick; such impervious materials as granite, slate, and flint having but little cohesion with ordinary cements; in the case of flint walling a certain amount of cohesion is obtained by using the mortar while it is hot, or before the lime in slaking has had time to cool.

In metals the cohesion of the particles depends very much on the process of their manufacture from the ore and the manner of treatment to which they are subjected. Thus if iron is melted and cast in a mould the particles arrange themselves in the form of crystals of a cubical or octahedral form, and the tensile or cohesive strength is small as compared with the power of resistance to crushing, the two forces being in the ratio of 1 to 5 or 6; that is to say, while the cohesion of cast iron varies from 6 to 10 tons, its crushing strength is from 30 to 50 tons per square inch of section. A considerable difference in cohesive strength is also found to exist between specimens of the same kind of iron when cooled rapidly or allowed a long time in cooling. When the proportion of carbon mixed with the iron is considerable, the cohesion is weak, but if subjected to a process which burns out a large portion of the carbon, it may be rendered tough and malleable, and its cohesive strength greatly increased. The material known as wrought iron has had the greater part of the carbon removed, so that the proportion is less than one per cent. of the mass, by the process of burning and then rolling or hammering, so that the crystals become lengthened out into fibres, which gives the iron immense cohesive strength, although it, at the same time, reduces its resistance to crushing by about one half. The form of section into which the metal is rolled or hammered considerably affects the cohesion; thus when made into round or square bars it will bear a strain of from 23 to 27 tons per square inch before being torn asunder; if, in the form of flat bars, the breaking strain will be from 22 to 26 tons, angle and tee iron will stand a strain of from 21 to 25 tons, while plates, if strained lengthways of the grain, are torn asunder with from 20 to 24 tons; but if the force is applied across the grain they will yield with a strain of from 17 to 21 tons. The resistance to crushing in short pieces of wrought iron is from 16 to 20 tons.

Another variety of iron in which rather more carbon is mixed with the metal than is the case with wrought iron, is termed steel, under which name, however, we find materials with great variety of cohesive power according to the mode of manufacture; thus ordinary soft steel has its cohesive and crushing strengths nearly equal, and amounting to from 30 to 32 tons per square inch; but in hardened steel the tensile strength is much greater, being generally about double that of wrought iron, and in some cases even much more than this. There is also a peculiarity about steel which gives it a great advantage as a building material over either wrought or cast iron—namely, that whereas the latter will have their elasticity permanently injured if strained with more than one-third or one-fourth of the breaking weight, steel bars or beams may be subjected to a load equal to one-half the breaking strain without their elasticity being injured in any serious degree, a property which renders it much safer to use than common iron.

Various experiments have been tried in order to ascertain the cohesion of the fibres of different kinds of wood; but so great a discrepancy is exhibited in the results obtained, that it is almost impossible to know beforehand how much force may be applied without producing fracture. Much depends, even in the same piece of wood, upon the amount of moisture it contains, the cohesive strength of wet timber being found to be about half that of dry timber; but, on the other hand, if the wood is over-dried its strength is materially diminished. From the experiments that have been made at different times, we find that the force necessary to tear asunder pieces of wood strained lengthways of the grain in tons per square inch of section is somewhat as follows:—Beech, 2·1 to 6·6; chestnut, 4·5 to 5·8; English elm, 2·4 to 6·3; spruce fir, 1·3 to 4·5; Dantzic fir, 1·4 to 4·5; American red pine, 1·2 to 6·0; American yellow pine, 0·9; Memel fir, 4·2 to 4·9; pitch-pine, 2·1 to 4·4; Riga fir, 1·8 to 5·5; English oak, 3·4 to 8·8; teak, 1·5 to 6·7. The resistance of timber to crushing is generally much less than its cohesive strength, being in some kinds of wood in the proportion of about 1 to 2, and in others of 2 to 3, when short pieces, such as cubes of wood, are experimented upon; it is therefore advisable to employ timber in a building in such a manner that its power of resistance to tensile strain may be brought into play rather than its crushing strength.

A knowledge of the cohesive strength of various building materials will enable the architect to arrange his design so as to get the greatest amount of work out of each kind of material he employs. Thus, since stone and brick have but small cohesive power, they will be best employed in such a manner as to put but little tensile or tearing strain upon them, while their great crushing strength is thoroughly utilised. Timber and wrought iron will be employed where great tensile force comes into action, and cast iron where a great crushing weight has to be sustained. Slate and steel, in each of which the tensile strength is more nearly equal to the resistance to crushing, may be employed in any way that appears convenient, the latter especially where a great load or strain has to be sustained, without risk to the structure.

CROWDING IN THE SUBURBS.

ANYONE who has watched the growth of our suburbs will have noticed two considerable evils which have sprung up from the encroachment of new buildings, and which promise before very long to make residence in the suburbs as disagreeable and as insufferable as it is in the denser parts, unless restrictive measures be carried out. The first evil to which we allude is the alarming intrusion of small houses upon the larger properties, the absorption in fact of every available acre or open space of ground by the speculative builder, and the destruction of once-beautiful gardens and open fields. The danger threatens to become yearly so formidable as to drive the wealthier and professional class of residents farther out, and to make our suburbs huge wastes of brick and mortar devoted to small trades and lodging-houses. But the danger does not stop here, for encroachment means encroachment on the rights of common and recreation for the people, and the diminution of the breathing area, or that degree of density of population which increases the Registrar-General's return as an inevitable and proportionate result. It means even more than this: the deprivation of light and air, and the exhilarative effects of open fields upon our children, the depressing influences of crowding, and, to the poorer classes, degradation, dirt, and misery. This state of things has been brought forcibly to our minds from what has been recently going on in the south and west of London, and the repeated grievances made known in the newspapers published more particularly in those parts, which seldom find expression in the greater and more central journals of metropolitan opinion. To take a sample of a few of these. One writes under the incognito of "Fresh Air," complaining "loudly against the nuisance of the brick-fields and dust heaps" in one locality of Brixton, the vapours and smells from which are sickening, and extremely distressing to dwellers in that large and overgrown part of London. Windows to parlours and bedrooms are obliged to be closed during the larger part of the day, and as the warmer weather comes, the nuisance is not only insufferable, but positively injurious to health. Another equally strong letter in the *South London Press*, under the heading of "Open Space," dwells at some length upon a greater nuisance, as he calls it. He says: "What I complain of is this: Large houses, with their beautiful gardens, are destroyed to build small property, or, perhaps, to make six houses out of one," and he cites the neighbourhoods of Stockwell and Herne Hill, where one dense mass of small houses exists, with narrow roads, and not one open space or public garden to be met with. And he appeals to our municipal rulers and vestries to check this reduction of open ground, and concludes by calling to mind the regulation of public buildings abroad, in such cities as Paris, Vienna, Turin, &c., with their fine wide roads and public gardens. A third and larger class of residents, who are obliged to dwell in localities under the control of the vestries, repeatedly protest against the unjust incidence of rating, in having to pay for roads that have never been properly made, or the substratum of which is wholly composed of rubbish and dust-heaps. Well may some exclaim, their own dust-heaps are brought from the back to the front of their houses. These are only a few of the complaints made which will be found to make up the staple of correspondence in the columns of suburban newspapers, and which are constantly repeated from one year's end to the other.

There is an artistic, as well as sanitary and moral, aspect to this question of encroachment which it would be injudicious to ignore, and it appears to us to be the duty of the architectural press to call attention to the unrestricted manner in which our building-estates are managed, and the pernicious nature of what, in a few years, threatens to become a great blot upon our architectural achievements and civilisation.

One of the principal causes which have contributed to the evil is the springing-up of new localities near the lines of our local railway systems, and the temptations offered to owners of land and the larger class of property to sell or part with their interests. The conditions of short leasehold tenures have also operated to favour the overcrowding of estates, and to take away the inducement to lay out capital on buildings of an architectural character. Plots of land are granted without restrictions, no plan of boundaries or the number of dwellings to be erected is laid down, and the consequence is the building of a small class of house, with cramped gardens — if they can be dignified by that name — overlooking the grounds of larger residences. There is no legal redress for the occupiers of these, who have to bear all the inconveniences attending a row of small tenements whose windows, back or front, overlook their grounds, depriving them of prospect, light and air, or otherwise destroying the residential quiet or pleasantness of the locality. The Land Clauses Consolidation and Amendment Acts, it is true, afford protection to owners and occupiers of property in the event of companies or projectors of railways and other works having power to take certain lands and buildings. The clauses in those Acts provide for compensation for compulsory sale, also for deprivation of rights and goodwill, deterioration caused by severance of land injuriously, lessening light and air, nuisances, &c.; but they do not touch that larger class of injuries inflicted upon estates by jerry builders, by the close edging round of small tenements, and there is no legal responsibility for injury or inconvenience caused by the speculative builder who chooses to obstruct the prospect from your windows, and seldom can compensation be obtained for diminution of access or frontage from these causes. The Lands Clauses Consolidation Act enables the owner to claim compensation, not only for land purchased, but also for damage caused by severing the land taken from other land, and the owner may compel promoters under certain circumstances to take that land, which severed would be of no value to him; but there is no statute which protects the occupier of a decent house or piece of land from the injury or nuisance of having his garden-front spoilt by the erection of a lot of back yards and pig-sties. It is true an injunction in equity may be obtained for *permanent* nuisances, such as swine-pens, lime-kilns, brick-kilns, offensive gases, smoke; and the Nuisances Removal Acts apply generally; but there are numerous pleas upon which they can be evaded, and the aversion people have to go to law or to indict for such offences make these legal processes almost dead letters. No occupier can resent the raising of a wall to interrupt prospect, for the law holds it to be only a deprivation of delight, not of what is absolutely necessary; nor is it considered a legal nuisance to destroy the privacy of another by opening windows directly overlooking his house or grounds. In cases of building close to another's property the only legal remedy is for obstruction of light and air; but this obstruction seldom amounts to the deprivation necessary to sustain an action in the circumstances we are considering. The obscuration must amount to a real inconvenience. So far, then, the occupiers of the better class of houses must submit or vacate them; they have no remedy against the encroachments of a greedy set of builders who, whenever they have the chance, pounce down upon some semi-rural locality within moderate distance of rail, take a lease of land, uproot all the fine trees, intersect it with numerous roads, and cover every available foot with buildings. The open sites are thus spoilt by constant invasions of the overwhelming tide of bricks and mortar, the few properties that remain untouched like islands of green park

or meadow, quickly fall in market value as "desirable" residences, and, in their turn, are swallowed up by the untiring demand for small houses. We only refer the reader to the transformations going on at Brixton, where some of the best and most open neighbourhoods are being divested of all their character and pleasantness by rows of mean tenements, the backs of which face the gardens of the better houses, and by what has been done at Streatham, the Dulwich-grove Estate, Peckham Rye, Wandsworth, and other parts. One writer fairly complains of the want of discrimination in the selection of sites for these mushroom dwellings, and that builders should be allowed to erect their wretched tenements over open spaces like Stockwell-green, in defiance of the public sense and in utter disregard of the rule that houses in the suburbs should have gardens attached to them. Our builders have, in their desire to produce rent, neglected to make their houses in size and character correspond with the locality, and as long as the public tolerate this state of things, it will be useless to look for architectural and sanitary improvements in dwellings of this class.

The invasion of residential estates and open spaces felt in the suburbs is made more palpable, from another no less crying evil which the Building Act of the Metropolis fails to remove. There is a complaint from many residents that no gardens are given to the houses on many new estates. Not content with hustling together several hundred houses on an acre or so of land with open gardens in contiguity, no provision has been made for even proper airing ground, and the tenants are compelled to endure the vexation of not only having to live out of town, but to enjoy none of the conveniences of a rural suburb when they get there. It is, besides, a cruel irony which brings people within sight of open fields and gardens, but denies to them a share in them. We believe it to be the duty of those who administer our local Building Acts to exercise some discretion in these matters, and, if necessary, to enforce restrictions upon builders by curtailing the means they possess of invading the rights of the occupiers of old estates, and by laying down a limitation of the number of plots of land for houses in suburban localities. It is hardly necessary to ask Legislature for greater powers than are at present possessed under our Building, Metropolitan Management and other Acts. All that is demanded is the exercise of discretionary powers and a little more restriction upon those who cover estates, a more careful supervision of the building in our suburbs carried on by irresponsible persons, or as much as is bestowed upon architects' work in the metropolis.

THE WATER QUESTION.—I.

THERE are several great questions before the public at the present time, some political and others not so. Of politics we have nothing to say here; but the water question is one which may be treated impartially, and the scope is certainly large enough. Most people are affected by the water question; some have too much, some too little, and others are supplied with water of bad quality, while some have no supply at all. The water question has many branches; those to be treated of here, in a general sort of way, are the prevention of floods, the supply of water for domestic and other purposes, the maintenance of navigations, the damming up of water for mill purposes, the levels of the outfalls of land-drainage, and the purity of river water equal, at least, to the preservation of fish. In considering any one of these, regard must be had to all the others. The management of rivers in England and Wales is at present under too many separate and independent authorities, whose interests are antagonistic to each other, and it seems impossible to allow the present state of things to continue much longer. All the water interests of each river basin should be under the control of one authority, composed of representatives of the various interests within the watershed area or river basin; indeed, two Bills have already been introduced in Parliament this session, the one in the House of Commons by the members representing Bedford, London, St. Ives, Stockton, and Herefordshire, "to make provision for the better prevention of floods, and for the conservancy of rivers," and the others in the House of Lords by the Lord President of the Privy Council "to make provision for the conservancy of rivers, prevention of floods, and other matters." Although the two Bills are alike in intention, they differ in their scope and provisions. The House of Commons Bill proposes to make the unit of area to be represented three parishes or one borough, which is to be a "sub-district," and the "district" is to consist of all the unions of parishes—the Poor-Law Unions—in any county; and the general district is to be the whole basin of a river having its outlet at the sea. In view of these provisions, it may be well to see what the number of parishes is in each county. They are, approximately, as follow. It must be premised that they include those parishes which are within boroughs. The order in which they are set down follows first, the South coast, then the East coast, the North-east, the North-west, and the West. Anything coming within the scope of the water question must be considered without distinction of boundaries between England and Wales, and, therefore, in following the Western coast, the order is not here broken by any such distinction. Taking the line of hills which range north and south through England, much more rain falls in the counties on the Western side of the range than in the Eastern or Midland counties; but as we are not now offering any comparison in this respect, it seems more fitting to take them in the order set down, viz.:—

Counties.	Number of Parishes.	Number of Unions.
SOUTH COAST—		
Cornwall	221	13
Devon	475	20
Dorset	287	12
Hampshire	358	26
Sussex	326	23
EAST COAST		
Kent	430	29
Essex	372	17
Suffolk	524	17
Norfolk	715	22
Lincoln	757	14
NORTH-EAST COAST—		
E. R. Yorks.	374	10
N. R. Yorks.	493	16
Durham	314	15
Northumberland	541	12
NORTH-WEST COAST—		
Cumberland	205	9
Westmoreland	110	3
WEST COAST—		
Lancashire	487	30
Cheshire	456	11
Flint	36	3
Denbigh	80	3
Anglesey	52	2
Carnarvon	88	4
Merioneth	48	4
Cardigan	106	5
Pembroke	144	3
Carmarthen	83	5
Glamorgan	170	7
Somerset	496	17
Monmouth	154	6
INLAND COUNTIES—		
Brecon	107	4
Montgomery	75	4
Radnor	46	3
Salop	300	15
Hereford	215	8
Worcester	276	13
Gloucester	363	17
Wilts	315	17
Berks	240	12
Surrey	155	16
Middlesex	211	27
Herts	166	13
Bucks	196	7
Oxfordshire	299	9
Warwick	233	13
Northampton	332	12
Bedfordshire	138	6
Huntingdonshire	87	3
Cambridgeshire	177	9
Rutland	67	2
Leicester	351	11
Staffordshire	275	16
Derby	279	9
Notts.	305	9
W. R. Yorks.	701	34
	14,861	647

In any consideration which may be given to the subject for the purpose of which these approximate numbers of parishes in England and Wales are given, it is better to exclude the metropolis altogether. Thus, deducting 191 parishes from the total number of 14,861 there remains for England and Wales, except the metropolis, 14,670 parishes, including those which are within the boroughs, and deducting for the metropolis, in like manner, 22 unions, there remain of them 625 in the 54 counties of England and Wales. The authors of the Bill may be able to show some good reason for limiting the extent of a sub-district to three parishes, but the number certainly appears to be very small. The extent of a "district" seems better, being practically co-extensive with the county; and as to the area to be dealt with by the General Conservancy Board, viz., the whole river basin, that has almost unanimous consent.

The Bill provides that in any "sub-district" the owners of property of the annual ratable value of £300 in the aggregate, may apply to the Local Government Board for a provisional order to put the Act in force, or a town-council may do the same: and owners of property of the aggregate annual value of £1,000 in any county, may apply for the constitution of all the unions into a "district," which would be, generally, co-extensive with the county, or thereabouts; or two boards of guardians, or one town-council, may do the same; and for the establishment of the "General Conservancy Board," having jurisdiction over the whole river basin, two town-councils, or the owners of property of the annual ratable value of £2,000 in the aggregate, may apply in like manner. The duties of a sub-district and of a district conservancy board would be to protect the river and watercourses, and to prevent or mitigate floods, by removing *débris* from their beds, and repairing and maintaining their banks; and a district conservancy board may, further, widen, straighten, or otherwise improve any watercourse, or remove any existing bank, wall, dam, or weir, or make any new one, or make any new watercourse or sluice; but these works are to be subject to the approval of the General Conservancy Board, and where the water-level may be lowered by the removal or alteration of any dam or weir, compensation for injury thereby is to be made. The General Conservancy Board is to be composed of representative members of

the district boards, members of town councils within the river basin, justices of the peace, owners of property rated at £100 a year and upwards, and members of any existing conservancy body within the area; so that the system is throughout largely representative of the ratepayers. The fund out of which the expenses are to be paid is to be raised by a rate upon lands as defined by the local government board, and which is to be levied on the same basis and subject to the same rules as the poor rate. This is to constitute a general conservancy fund, but a district board or a sub-district board may raise a fund solely within their district by a separate rate, for the purpose of carrying out any work solely within their district; but the General Conservancy Board are to have a veto upon this if they are of opinion that any such proposed work would be injurious to the general interests of the area of their jurisdiction.

Former Acts of Parliament have failed of their purpose in the matter of rating the lands proportionately to the benefits received. In this Bill it is proposed, under the head of "Special benefit of particular lands," to charge such lands as the Conservancy Board may declare to be particularly benefited by works carried out by them, with special expenses, as private improvements, the fund for which is to be raised by a private improvement rate in the same manner as such rates are raised under the Public Health Act, 1875. The Conservancy Board may, with the approval of the Local Government Board, borrow the money required for the purposes of the Act from the Public Works Loan Commissioners, for a term of years not exceeding fifty. The occupiers are to pay the rates and deduct them from the rent next due. These are the chief features of the Bill introduced in the House of Commons. In defining the area over which a General Conservacy Board is to have jurisdiction as "the basin of any river having its outlet at the sea," there appears to be a defect. It may, perhaps, be amended when the Bill comes before the committee; but as it stands, in that respect, several large and important rivers which ought to have separate conservancy boards, would be included with others which are large enough without them; thus the Wye, which has a watershed area of 1,609 square miles, would be included with the Severn, and the Trent and the Yorkshire Ouse would both be included in the basin of the Humber, whereas the Trent and the Ouse ought certainly to have separate conservancy boards; the one is 4,052 square miles in extent, and the other 1,842 square miles, and they enter the Humber from opposite directions; and there are other similar cases. Then, as the Bill stands, each little river all round the coast having its "outlet at the sea," would have its conservancy board, whereas it would be much better to combine several of these with adjoining large river-basins. In the Government Bill introduced in the House of Lords, it is proposed that adequate provision shall be made for the representation on conservancy boards of owners of property as well as of occupiers, and for that of urban sanitary authorities, and of existing conservancy authorities. The purposes of the Act are declared to be (1) the protection of land from injury by floods; (2) the arterial drainage of land; (3) the storage of water for drinking or other purposes; and (4) warping, or the irrigation of land. The Conservancy Board is to have jurisdiction over a river-basin or contiguous river-basins, and in order to procure the constitution of a board, any twenty or more owners or occupiers, or any twenty or more owners and occupiers of land of the ratable value in the aggregate of not less than £2,000 a year, may apply to the Local Government Board for a provisional order constituting the district and establishing the Conservancy Board, who may cleanse, repair, and maintain any watercourse or outfall for water, or any wall, bank, dam, or other defence against water; and they may deepen, straighten, or embank any watercourse, or raise, widen, or alter any bank or dam; and they may make any new watercourse or new outfall, or construct any reservoirs or other works for storage of water. Of course, any person injured by any work would be compensated. The occupiers are to pay the rates, and deduct the amount from the rent next due. Where the improvement of any work or the construction of any new work would be of special benefit to particular lands, the Conservancy Board may make the execution of such improvement or new work conditional on the owners of those lands consenting to bear the whole or some equitable part of the expense, and those works are to be deemed improvements of land under the Improvement of Land Act, 1864. The money required by a conservancy board for carrying out the new Act may be borrowed at interest in the manner provided by the Local Loans Act, 1875, for a term of years not exceeding 60.

A conservancy board may sell, for drinking or other purposes, any water stored by them.

The land within a river-basin is to be divided into three descriptions—lowlands, midlands, and uplands—each description of land contributing to the expenses in a different proportion. The highest rate for the upland is not to exceed one sixth of the general rate of any other lands. Whether it is just and reasonable thus to divide the lands of a river-basin must be subject for our consideration on a future occasion.

ARCHITECTURAL ASSOCIATION.

An ordinary meeting of the Association was held on Friday evening, the President, Mr. E. C. Lee, in the chair. Mr. Eales, hon. sec., announced that the second visit of the session would be held on Saturday afternoon the 12th inst. (to-morrow), when Mr. T. Roger Smith's new Hospital for Consumptives at Hampstead would be inspected.

The President read a letter from the librarians, announcing that as the time during which the library was opened had proved insufficient, an experiment would be tried for the remainder of the session of increasing the time on and after February 11, to one hour each Friday evening, from 6.30 p.m. till 7.30 p.m. on ordinary meeting nights, and from 7.15 p.m. to 8.15 p.m. on the alternate class-nights. The announcement was received with applause.

THE SANITARY WORK OF AN ARCHITECT.

Mr. Ernest Turner read a lengthy paper treating upon the general principles of sanitary science and their application to house-construction. A number of illustrations of the elementary principles of disconnection and manhole inspection, lent by Mr. Rogers Field, were hung on the wall. Beginning with aspect, he advocated the importance, wherever the architect had a choice, of planning the principal rooms to face south, so as to gain all the light possible, and to allow the windows to be frequently opened. The choice of site was even more important, but the architect seldom had an opportunity of selection, although he could do much to render it healthy by under-drainage, care being taken that these drains did not communicate with the sewers. If the site consisted of "made" ground, an attempt should be made to secure a plot that had been made for at least two years before being touched for building purposes. The deleterious effects of ground-air when drawn into houses were well known, and the evil could be guarded against by covering the entire surface of site with asphalting, or a 6in. bed of cement concrete, rammed solid. A free circulation of air between this impervious bed and the floors above should always be afforded. Too frequently, in country and suburban houses, the damp-proof course and air-bricks were not built sufficiently high in the walls, and when the adjoining paths and flower-beds were raised these protective arrangements were choked. While architects were agreed that brick-built houses were healthier when constructed with hollow walls, it was surprising to see how few houses were built in this manner. In the matter of soil-drains, he must admit that many architects, even those standing well in the profession, had shown culpable neglect. Not long since, he was called upon to investigate the cause of a pestilential odour in a London mansion, which had been built four years previously, from the plans and under the superintendence of a well-known member of the profession. Examination proved, that, owing to the defective construction of a trap and improper pipe-laying, scarcely any of the house drainage ever reached the sewer. About 3,000 gallons of sewage had to be pumped out from under the floors of two houses, a considerable quantity of the saturated earth removed, the whole place disinfected, and a bed of concrete laid. Unless the pipes were examined, many defective ones would find their way into the work. He had sometimes condemned as many as 60 per cent. of those brought on to the site, although they had been sent from well-known manufacturers. They should be laid to uniform fall in straight lines, all bends being made by bent pipes. Before the pipes were covered in, the lower end of drain should be blocked and the pipes filled with water to test the joints; the levels should also be tried. Very good work could be made with Stanford's joints, run in with Russian tallow and resin; but where the pipes ran under the floor, as they must do in most town houses, iron pipes, coated with Angus Smith's preservative solution, might be used, the joints being run with lead. In detached and semi-detached dwellings no drain need, and no drain should, run under the floors. Man-hole chambers should be constructed outside the house, where possible, so that the drain and its branches should be accessible and capable of being cleansed with a brush without disturbing the floors. House-drains should be made as small as possible, for the smaller the pipes, the less the friction, and consequently the greater the hydraulic pressure and velocity, and the less the chance of obstructions taking place. The consequence of the neglect of this principle had been that most of our sewers and drains in London were too large, and were as a result laden with deposit, which evolved foul gases. As to inclination, he had found in practice 1 in 30 none too great a fall to give to the house drain. Disconnection and ventilation of the drains, with the object of preventing sewer-air from passing into the building, were of high importance. It was complained that there was a bewildering variety of patented apparatus provided for these purposes, but he was convinced that if young architects would acquaint themselves with the general principles of disconnection and ventilation, and would inspect what had already been done by architects and engineers, they would soon master the details, and would learn that for the attainment of these objects no patent systems were necessary. In the first place, a siphon-trap should be fixed between the building and the sewer, and between the trap and the building the drain should be open for from 2ft. to 4ft. In brick houses and where the drain was not deep, an open channel with brick sides, widened out at the top and covered with an open grating, answered well; but where the drain was deep or large, a brick manhole should be provided having an open channel through which the drainage would pass through the siphon into the sewer. The soil-pipe should be carried outside the building well above the roof, undiminished in section, and he attached very little importance to any cowls. The plan of utilising the rainwater-pipe as a drain ventilator was vicious and unsatisfactory, and the pipe was of no use during a storm, when most required for ventilating purposes. Where the level of outfall would not admit of the drains being laid with a good fall, frequent flushing was necessary, and for this purpose a flushing cistern fitted with Rogers Field's annular siphon did the work effectually and satisfactorily. No waste-pipe should be carried into a drain, or even into a trap, unless there was a free current of air between the end of pipe and the water seal. The most important was the overflow-pipe from the cistern, which was even now frequently connected with the drain or with the ⊃-trap under the closet—a cause of much fatal disease. One of the best regulations ever made by the water companies was that in new houses overflow-pipes were to be formed as warning

pipes only. Amongst traps, the ⊃ and bell traps must be condemned, and by these two appliances he believed more illness had been caused than by any other. The S and P traps were the simplest and best, and for receiving waste-pipe drainage, Doulton's cheap gully trap was one of the best. Water-closets might be divided into three classes—pan, valve, and wash-out. Although pan-closets were condemned by all who knew their filthy retaining capabilities, they were still manufactured daily and by the thousand; he hoped they would ere long be prohibited under all local by-laws. The result of his experience with the valve-closet was that, if properly constructed and trapped and supplied with water, it was less open to objection than any other. The simplest apparatus was the wash-out, of which there were many varieties, including Bostel's and William White's. In what were called trapless closets, as long as the supply of water and the plunger which closed the outlet to drain were in perfect order, the operation was very good; but if the water failed, the air from the soil-pipe would enter the house through the overflow pipes when the plunger was raised. His experience was against the use of the ordinary valve-closet used without a trap under it, and, indeed, the advantages of a properly constructed water-trap under a closet out-weighed all the objections that could be raised to it. The waste from the safe should be carried through the wall and left projecting with simply a hinged copper flap to prevent draughts. For the service of water to closets, a 1½in. pipe and valve should be provided where the bottom of cistern was less than 8ft. above the w.c. apparatus; a 1-inch pipe and valve up to 12ft., and a 1½in. pipe and valve for all above. For wash-out closets the diameter should be increased in each case by ¼in. The water-companies' regulations, by which the flushing of closet was limited to two gallons, was an unsanitary measure, as that quantity was insufficient to cleanse the closet. For wash-out and hopper closets nothing was better than the siphon waste-preventer, which gave a sudden flush. Although there were many waste-not valves, none had been brought to perfection, but Tylor's seemed the best. Closets should be kept, as Dr. Thompson had suggested, at a higher temperature than the house, so that the current of air might be towards the closet instead of from it. The position of the cistern was one of the most important sanitary arrangements of a house. The cistern should have no chance of being contaminated: it must neither be too warm nor suffered to become frozen; it must be covered in and readily accessible for cleansing. In conclusion, the lecturer dealt briefly with the subject of ventilation, remarking that architects were too apt to look out for some single apparatus, some patent appliance which could be specified without any further trouble than giving the name of maker and price. They might search in vain for any one system that would satisfactorily meet every case. To introduce in the simplest and most economical manner a constant supply of fresh warm air at a rate of about 3,000 cubic feet per head per hour was the problem to which architects would do well to direct attention, and one on which he hoped to speak on a future occasion.

Mr. Rogers Field, B.A., remarked that the rule of safety in dealing with the enormous number of sanitary appliances now in the market was first to master the principles of sanitation, and then to apply them to the circumstances before you. If the action of the apparatus could not be understood, then actual trial should be made before adopting or rejecting it. These elementary principles were so simple that they were generally overlooked; they dealt with the immediate removal of all foul matters. Proceeding on this rule, the old ⊃-trap, the pan-closet, and the dip-trap were alike condemned. Stanford's jointed pipes had been referred to, and these were excellent if they fitted accurately, socket to spigot; but it was necessary that the joints of these, and any pipes, should be carefully tested when laid. That very day he had to deal with a builder who had told him that the cement-joints caused obstructions to flow in the pipes, that clay-joints were unsafe, and that he himself put nothing at all between the lengths of pipe—a practice which need hardly be condemned in that room. He agreed with the lecturer that the house-pipes used were generally too large to give an efficient scour. Manholes were often objected to on the score of expense, but he maintained that in the long run they were less costly than the breaking up of drains otherwise necessary. Where manholes were impracticable, inspection caps should be placed on the drains at the most accessible points.

Mr. E. G. Hayes wished to raise a point not sufficiently, in his opinion, considered. Mr. Turner had laid it down as an axiom that there should be no connection between the cistern for water supply and that for the closet service. Looking to the great inconvenience of multiplying household cisterns, he would ask, Was this duplication absolutely required where waste-preventers were affixed to the closet supply? He was inclined to believe there was no danger of contamination. He proposed a vote of thanks to the lecturer.

Mr. G. J. Symons was not able to show that effluvia should be conveyed from the closet to cistern if a waste-preventer were used; but as drinking-water ought to be above suspicion, he would under no circumstances permit both services to be drawn from the same container. An important point in ventilation of soil-pipes was that any reduction of the diameter of pipe increased the friction of the air, and thereby checked the current.

Mr. William White, F.S.A., reminded the last speaker that in many London houses it would be difficult to provide two apartments for the duplicated cistern, and, unless they were widely separated, it would be of little use adopting two cisterns. While he believed a waste-preventer materially reduced the danger, except where there was a leaky valve, he thought a distinct, if small, feed-cistern should furnish the closet service. The closet should be thoroughly flushed out at each using; the wash-out was the only form of basin a sanitary man would specify. With sanitary pans, deservedly so-called, there was no opportunity for the accumulation of foul air, and the operation was single and simple. He was surprised to hear Mr. Turner speak with semi-approbation of the valve-closet, which was under-trapped. For his own patented closet, he claimed that it had a waste-preventer, which could be made of any size up to 6 gals.; but practically he had found from 2 to 2½ gals. flush sufficient, if it were sudden.

Mr. E. Griffith, C.E., considered the most important principle in house drainage to be that all fæcal matters should continue in motion till they reached the outfall. If Tyler's closet were used, with an S or P trap, and the intervening length ventilated, it was almost impossible for a smell to be perceived in the house. In 999 out of a thousand cases traps, cowls, and all patent apparatus might be abandoned without risk, provided this primary point were borne in mind. At a recent sanitary congress at Exeter, architects received many severe raps, and he did not think altogether with justification; but even now they paid little attention to drains. He had that week inspected, in the West-end of London, a group of new and expensive houses where the old pan-closets were in use, and also D-traps, and the soil-pipes were unventilated; and yet one of these houses was sold for £12,000. Something must be wrong in the architect. He had never seen a house properly drained unless the drains were laid by a specialist. (Laughter.) You could not find a single Government building that was properly drained.

Mr. H. H. Collins condemned the waste-prevention regulations by which water companies deprived the users of a constant system of the effectual flushing of closets. He would defy any architect or specialist to make his apparatus perfect. His recent experience of Stanford's joints in a house building at Lancaster-gate was that the builder paid him the compliment to say he should not take another contract under him unless he added 10 per cent. to the contract. He found it utterly impossible to get these pipes to fit true, and, though he had them up six or seven times, he had even now very grave doubts whether they were perfect. His plan was to fill them with water, so as to test the tightness of the joints. He considered Potts's chamber as simpler and less costly than a disconnecting manhole. As to Professor Kerr's suggestion to build sanitary shafts as annexes to houses, they would be greater abominations than the present system.

Messrs. E. C. Robins, Douglass Mathews, and others, having spoken, Mr. Turner replied upon the discussion. He admitted that where the disconnection of a waste-preventer existed between the closet and the cistern, there was very little danger of contamination; but he had never found practical difficulty in insisting on having a separate cistern, and unless one adhered to the principle of separation, the health of the household depended on any plumber who might afterwards be employed. He thought the convenience of a manhole outweighed the initial outlay, and the cost was less than that involved in taking up drains. The architect should insist upon drainage being as much an element of the house with which he was entrusted as the construction or the decoration.

THE CAPABILITIES OF RENAISSANCE.*

By Andrew Dewar.

(*Continued from page 95.*)

THUS far we have been speaking only of carving; as a short digression; what has been the advance of *form* in 600 years? An English architect in the 13th century conceived that a nave, side-aisles, transepts, and choir, with a central and two western towers, was the most fitting shrine in which to embody his religion, and an English architect in our day confesses he cannot improve on it, though asked to provide for a different ceremonial and a changed religion. Progress of *form* in 600 years may thus be summed up as *nil*; progress in carving—*backward*.

In Renaissance proper, although the change in its ornament is not so varied as in Gothic, it is no less marked. In the early forms sculpture and ornament are sparingly introduced, and then, like Gothic, only in panels near the eye where the story could be read, or on the friezes of such a size as to be easily decipherable. As time went, on fronts like the Certosa of Pavia grew into an architectural bear-garden. Cornices, bases, pilasters, panels, niches, and window-heads caked themselves with ornament in the richest profusion—some of the latter in beautiful and imaginative designs, while the figures vied with the life. Later, the statues were exiled to pedestals on the skyline, keeping guard with hundreds of empty urns, to give a funereal aspect to the design, while the ornament near the eye was of the most regular and exact description, entirely without meaning. Lastly came on the Borromini and Rococo styles, where flying Venuses hold stone festoons with stone ribbons; where beautiful acanthus-leaves grow out of lions' tails, and circumnavigate the whole panel; where men's feet take root and devolve, contrary to the Darwinian theory, into the vegetable creation; and rose-trees, in fulfilment of the doctrine, blossom into eagles' heads. Then mouldings are stopped and "woe-begone figures in impossible attitudes cling to broken pediments for dear life"; while Venice can show a church in which huge folds of marble drapery may be seen, warranted to look like the original at so much a yard—a sight which always draws bursts of admiration from the ladies. Even cherubs, with double-action wings meeting somewhere in front and unconnected in any visible way with the body, fly over altars and pediments in picturesque profusion.

In the revival of Renaissance—for Renaissance in our day has been honoured with a revival—the absurdities are invariably first seized hold of and copied with cheap exaggerations. Festoons, ribbons, broken pediments, Darwinian monsters, *et hoc genus omne* spread themselves in the most unmeaning manner, and make us wonder if architects will ever be wholly original.

It may not be out of place to notice a conspicuous freak of the late Renaissance in sculpture, idealising new birth, we suppose, in nudity. In St. Paul's Cathedral, the great lexicographer, Dr. Samuel Johnson, stands as Adam in the garden of Eden, a veritable Hercules in form and muscle; but we doubt whether even Boswell would recognise him. Fancy the absurdity of Dr. Johnson waddling about St. Paul's as an Apollo. Another similar instance is in Milan, where Napoleon, by Canova, is posing as Mercury in his usual undress of a hat! We have seen this costume in Panama with the addition of a switch, but there the climate is more congenial than France.

We may thus sum up, as we did Gothic, the

* Paper read, Jan. 19, before the Edinburgh Architectural Association.

progress of Renaissance in 400 years, both in form and carving, as almost *nil*.

In this rambling way, which is as good perhaps as any other, we are trying to give you a general idea of what Renaissance is, what it should be, and how architects have conceived it ought to be; and this in its main features is a story which has undergone repetition in every country in Europe. One great difference, however exists between the architecture of Italy and other countries, for while it may be said to have stood still there for 200 years, or only to have made feeble copies of French art, in France the First Renaissance was succeeded by the Revival, in which the forms and details were mere copies of the old Roman, while an almost distinct style was developed in their chateaux, in the time of Francis I., and another almost equally distinct is in progress in their architecture of to-day. In Britain, not only have we had a Revival, but an extensive dinner of the styles, with courses innumerable, and that too without as much original development as the French, for our only boast is our stiff-necked Elizabethan. Thus, even in this century, we commenced with Greek and Roman, then followed a little Tudor, a taste of Venetian, some Early English, Scotch Baronial, Elizabethan, and Queen Anne, till now, sick and tired of every one, the Lord only knows whom we shall copy from next.

We have, however, some hopes of the profession. We are not inclined to believe altogether that architects are the women of the learned arts, who change their fashions as often as their prototypes their dress, and now is the age's opportunity; now, in the words of the preachers, is their day of salvation. The impulse given to the Queen Anne development of Renaissance has been so widespread, and the new forms and expressions added to our architectural vocabulary of such beauty and value, showing, also, an endless variety in the same, that a new English Renaissance has a clear course before it which may be made as distinct as the French, as beautiful, as flexible, and as durable.

In seeking to expound the capabilities of Renaissance proper, and its almost undeveloped resources, we wish it to be understood we do not disapprove of a Renaissance in any style so that it be Renaissance—new birth—and not revival. The difference between the two, you will remember, is this: in the Renaissance there is fertility of invention, originality of feature, life in the detail, and progressiveness in the form; while in the Revival invention is an incubus, thought a drug, and life a superfluity; the man who can mimic is an artist, and the perfect copyist a genius. Perhaps we may, without being invidious, call attention to some examples in Edinburgh in illustration of our meaning. In the New University building we have a good example of Italian Renaissance, for the form expresses boldly the requirements of the interior, and the ornament is subordinate, and gives emphasis to the construction. In the old college we have a medium between Renaissance and Revival, which is more worthy of commendation than blame; in the high school, a masterly treatment of Greek, which we are all proud of, though not without defects. As an example of English Renaissance, perhaps no work in the city compares with the late David Bryce's masterpiece, the Bank of Scotland; while in Gothic, as a worthy rival to the spire of any English cathedral, we would have you, in wonder and admiration, pay your devotions before the General Assembly Hall, said to be by Pugin, in Gillespie Graham's name.

Of examples of the first life of a style—which should have preceded Renaissance—we have St. Giles, Holyrood, and Trinity, all very good Gothic, but great sufferers by iconoclasts, restorers, and Ruskin's horror—railways.

Of Revival in all styles, we are unquestionably rich; so much so, there is not the slightest necessity for architects supplying us with any more. Out of dozens, we shall only single the most conspicuous, such as the National Galleries, Surgeons' Hall, Commercial Bank, Burn's Monument, Melville Monument, Fettes College, New Infirmary, St. John's Episcopal Church, &c.

Nor would we be a typical British city did we not possess magnificent works of dead art. In the modern style, we have that supreme milk-churn, the Nelson monument. In Scotch Baronial—we know not what else to call it—that German combination, puzzle and toy, the Calton Gaol. In Egyptian, that huge darning-needle, the Martyr's monument. In Gothic, those panoramic pasteboard screens, the Free Church College and Nicolson-street U. P. Church. While in Classic we have all the Established churches of the city.

Rich as Edinburgh undoubtedly is in large works of Classic architecture, she is far surpassed by Glasgow in these as well as in new examples of a pure Renaissance. So numerous are they, indeed, that it would be almost invidious to mention them; but we cannot pass over the Fine Art Gallery, *Glasgow Herald* Office, and New Club Buildings. Her architects also are numerous and well known; but the man, above all, who has made Glasgow what she is in Classic Architecture, and whose name is reverenced by her citizens as one of her greatest sons, is that of "Greek" Thomson. Thoroughly imbued with the spirit of Grecian architecture, he never wavered in his devotion. Style after style swept over the city, drawing all in its vortex, but he alone remained faithful, and the consequence is that while his contemporaries are almost forgotten, he, in his works and apart from his works, still lives, and in that masterpiece St. George's Church and spire, which dominates the city and catches the eye of every stranger, he has erected what a man of genius only could have accomplished, a building fitted to rank beside the greatest works of ancient Greece.

During the Gothic mania we were, with most architects, of opinion that Gothic was suitable for anything and everything; and the many able designs by enthusiastic and cultured architects at the time confirmed us in this; nor are we yet shaken in our belief that, if masterly handled, it is so; but how many architects have handled, it in a masterly manner, or even fulfilled the promise of their youth, and kept themselves free from from a grovelling copyism? Revival, unfortunately, is ever ringing in their ears, and not Renaissance. It is only necessary to say that when an architect forgets the best traditions of his profession and emulates the jeweller; when, as in Ely Cathedral restorations and the Prince Consort Memorial, twisted columns and inlaid precious stones take the place of natural forms and architectural history in carving; when monsters still decorate porch-doors and window-labels; when the old forms are repeated *ad nauseam*, without reference to the new requirements of the age—then it is time for the second Gothic, as it was for the first, to die.

With all due deference to Mr. Ruskin, we think the Scott Monument, for the time it was produced, one of the noblest conceptions of the human mind. Whether we take it for its fitness for the purpose required, its originality of form, or the correctness and unity of detail with which it is carried out, it tells us, as with undying authority, that the too-much forgotten name of George Kemp has only one rival in Britain—Sir Christopher Wren. Scott's monument one would therefore class as a work of true Gothic Renaissance, not Revival, for this, if for nothing else, that its form is essentially new; and herein true living art ever consists in any style and in any age. Pure detail is necessary, and its correct application is, indeed, a high accomplishment. Yet it may be, and often is, but the ornamentation of a structure otherwise dead; while original and appropriate forms to true needs, however rude the detail, so it be not false, marks the true architect, and is a living testimony to the fact of an art having progress. In some of our own Late churches (and we are proud to say they are by Edinburgh architects, and worthy members also of our own Association), we have works of a true "Renaissance"; we refer to Barclay, Brougham-street, Morningside Episcopal, and Mayfield Free Churches. In all these there is a decided French feeling; the Gothic is Continental, but it is not mere bones: the flesh and blood are visible through them, and the forms are original and appropriate. Long may it be so, and it can only be regretted once, and that is for ever, our own architects had not the opportunity, as they had the capacity, of designing a cathedral for the city worthy of the best Scottish art, the fitting representatives of the Scottish mind which evolved the Scott Monument.

While on Gothic Renaissance, we would ask why domes are not oftener constructed, and even in Gothic, why do they not oftener take the place of spires? In approaching any city it is not the spires that strike awe into the traveller, and prepare him for the beautiful in art; for to our mind they look too much like splinters broken from some wreck beneath; while a dome rising in quiet majesty into the sky, darkening the heavens with its bold bluff outline, yet veiling itself with the atmosphere of distance, is an object worth a hundred spires; a work of man's hands that never failed to please, and to increase our respect for the dignity of human conceptions. 'Tis in this direction and in the infinite combinations of domes with pinnacles and spires, that one of the roads of progress in Gothic leads, unless, indeed, mortification has not set in too badly for the present.

Having now in a general way indicated wherein the capabilities of all kinds of Renaissance consist, we will particularise with Renaissance proper. To say it would be unsuitable for churches would be to deny merit to several of the grandest churches in Christendom—St. Peter's, St. Paul's, and the Pantheon, Paris. Still we would be inclined, seeing we have a grand indigenous Gothic of our own, to erect churches in Gothic as a style suitable for the purpose, taking care at the same time to develop it from its purest period, adapting it according to the needs and requirements of each varying age. At the same time most interesting churches have been built, such as St. Eustache, Paris; and Notre Dame, Dijon; where the form is Gothic, even to flying buttresses and pinnacles, and yet the detail is essentially Classic. These churches were as interesting a study as any on the Continent. The strange effects produced by the unwonted combinations, in many instances so pleasing, showing also how they could be improved, that we wondered why the style ever became still-born. To say they are infinitely better than the machine-made copies of old parish-churches, such as hundreds throughout the country, is faint praise, and if in attempting to follow these old architects we succeeded in even approaching in their originality, it would show that at least we were men—not monkeys or Chinamen. It is our belief that in this direction only will architecture progress and keep itself alive: by Gothic, for instance, adopting Classic and Renaissance forms, and treating them with Gothic freedom, and *vice versâ* by Renaissance, borrowing from the Gothic that freedom and elasticity which at present is all its own.

For all buildings of a secular nature the Renaissance is eminently suitable. It gives all the breadth, mass, and dignity required for municipal and monumental edifices, and yet is light and airy enough for a villa. A building in Renaissance, therefore, cannot fail to please, if it is truly designed to represent its purpose; if uniformity, merely for the sake of uniformity, is avoided; if newforms are constructed for a definite purpose, and not merely for novelty; if doors, windows, cornices, chimneys, and towers are not copied, but are specially designed for special uses and the beauty of the building as a whole; if ornament is only used to emphasise construction, and sculpture and carving to illustrate the purposes of the building or tell its history. For this latter purpose natural forms are preferable, and should be introduced with a meaning. Monsters and monstrosities are to be avoided, and can only be pardoned on very exceptional grounds. Although found in good Renaissance and even good Gothic, where we pardon it as a quaint conceit on the part of the carver, no reason on earth exists for, and no meaning is conveyed by, animals with bodies ending in volutes and foliage. Animals, if introduced, should be perfect and foliage natural; nor can we see in a building which is otherwise anything but a visible indication of artistic dissolution in the architect and in the art.

In conclusion, we would wish to have it impressed on us all that the gist of all Renaissance is to be truthful; that in art, as in morals, "honesty is the best policy"; and originality, especially in form, the escutcheon of the genius.

WATER: ITS COLLECTION AND DISTRIBUTION.

On our desk lies a little octavo with the above title, written by Mr. Joseph Parry, C.E., intended as a practical handbook for domestic and general use. That such a book is wanted

* Water: its Composition, Collection, and Distribution. By Joseph Parry, C.E. London: Frederick Warne and Co., Bedford-street, Strand.

by the general public may be testified by the general confusion and inconvenience arising from a frost such as that we have recently experienced, or from the temporary stoppage of domestic services, arising from sundry causes connected with cisterns and ball-taps. There is a great want of knowledge among a large class of householders of sanitary fittings, and we have even heard absurd remarks made by people of alleged faults of screw-down taps, the bell-traps of sinks, &c. The author relates a story of a local-board engineer who recently called at a cottage and was asked to look at the tap. "It has been here," said the woman, "about a year, and scarcely any water will come out of it, and it's always leaking." The tap was one of the screw-down sort, and had never been properly open or shut, but used as a plug-tap. Other similar instances might be mentioned in the experience of all surveyors who have had to visit houses in their districts, proving an utter want of knowledge of the proper use of fittings. The first chapter of Mr. Parry's book enters into the earlier history of domestic water supply, the Health of Towns Inquiry, and other legislative measures. We quite agree with the remark made that the present tendency to centralise in a Local Government Board should be watched by district authorities with jealousy. Compliance with a Government department may be certainly purchased dearly, for, as the author justly says, it tends to lessen the sense of responsibility and represses the exercise of intelligence on the part of local bodies. Its proper function is the laying down of general principles, leaving details to local requirements. The author takes a practical view of the subject; he thinks the occupier, no less than the local authority, has a duty to perform in making himself a master of the sanitary appliances of his own house, and that it is the consumer's co-operation that is required to prevent waste.

Speaking of filtration, the author exposes the popular delusion that a patent filter is capable of purifying water. The mechanical impurities it arrests, on the contrary, foul the filter by collecting in the pores of the material, and as the Rivers Pollution Commissioners point out, myriads of minute worms were developed in the animal charcoal of one of the best house-filters, and passed out with the water when the filters were used for Thames water, and when the charcoal was not renewed at sufficiently short intervals. The most effective filtering materials are said to be animal charcoal, the magnetic carbide of iron and spongy iron. One or two forms of rain-water filters are illustrated in section. In alluding to the London Water Supply, the author advocates local administrative control, instead of irresponsible water companies, who only care to secure a good dividend, but who care not a pin about either the purity of the water delivered or its sufficiency. We also find the author objecting to the house-meter system as tending to restrict the necessary use of water, and adding to cost and maintenance, and he attempts to show that waste can be prevented by a more intelligent interest and attention to appliances.

Water-rating is discussed, and Mr. Parry shows how consumers in three towns, charged at the same water-rate, may have to pay very different amounts, as the rate is levied upon the net annual value with a 30 per cent. deduction, or upon the same with only 10 per cent. reduction, or upon the gross rent. The tables given of rates charged at different places illustrate the importance of one rateable value as the basis. The remarks on domestic appliances are practical. It is hardly necessary to speak of the desirability of the protection afforded by a well-fitting cistern cover, of ease of access to cisterns, their position in well-ventilated parts of a house, their periodical cleaning—matters easily recognised as important but seldom attended to. The greater evils of connecting water-closet with the cistern by overflow pipes, or the use of one cistern for water-closet flushing and also for drinking are pointed out and illustrated, and the merits and defects of the several kinds of closet basins are indicated, though not with the clearness we could have desired. The author describes the usual means of cutting off the entrance of sewer-gas by carrying up the soil-pipes, the use of traps, &c., but we find some useful methods are not mentioned, such as the disconnection of drain-pipes by the use of ventilating gullies, open soil-pipe heads, &c. The hints given on the different kinds of ball and other taps, regulating cisterns and pipes will be of service to the class of readers to whom they are addressed; and the author administers a few raps to architects who, in spite of warning, continue to lay pipes behind plaster-work, and neglect to provide wooden cases for them, and he says they will make no change until compelled to do so. We may usefully repeat the advice that lead pipes should not be laid in ground containing cinders or chemical refuse or lime, if they are expected to last, but that a wooden V-shaped trough should be formed covered with asphalte. A short chapter on "Effects of Frost" will be welcome to many readers, but it only mentions a few of the ordinary remedies. Outside stop-cocks are recommended on all service pipes, and a draw-off cock at the lowest point of pipe inside the building, so that water may be drawn direct from the main when a frost occurs. We have no space to dwell on the chapter devoted to rural water supply, pollution of well-water by sewage, collection of rain-water, construction of tanks, though various hints may be found of service. We may repeat that the book does not pretend to be a complete handbook of appliances; its author's aim has been to instruct the uninitiated, and to furnish the householder with useful information respecting the sundry domestic water appliances, and this task has been performed with ability and moderation.

VENTILATION: ITS PRINCIPLES AND PRACTICE.

"THE Practical Ventilation of Public and Domestic Buildings" was the title of a paper read before the Birmingham Architectural Association by Mr. William Henman, architect, of that town, on the 1st inst. The subject matter of the lecture was cast in a rudimentary form, with the aim, as the author explained, of permanently impressing the principles and facts of ventilation on the members' minds. Ventilation was defined in the act of obtaining in any inclosed or partially inclosed space a healthy atmosphere, *i.e.*, an atmosphere from which had been removed the contaminating products of putrefaction, combustion, and respiration. This could only be achieved by removing the vitiated air and replacing it by fresh air. This process would, unless care were taken, occasion discomfort to the occupants of the inclosed space in more than one way—by the influx of suspended particles in the air, and by the actual movements of currents of air. The practical problem then was to change the air without introducing dust or draught. The first part was answered by passing the incoming air through sprays or over the surface of water, or with better effect by passing it through wetted cloths or loosely-packed cotton wool, care being taken frequently to renew the straining surfaces, or the air would after a time receive greater contamination than it parted with. The second part of the problem, the avoidance of draught, was more difficult of solution, and this result was only to be effected by careful disposition of inlets and outlets, and regulation of size so as to give a diffused flow of air into and out of the apartment at the rate of not more than 1½ft. to 2ft. per second. Having explained the laws of diffusion and absorption of gases, Mr. Henman proceeded to the practical development of the laws he laid down, remarking that not only should our dwellings be ventilated, but they should be built on an impervious foundation; the streets should be laid out so as to allow of free currents of air through them, and the drains and sewers should also be supplied with means of changing the air. For dwellings natural ventilation might be relied upon, but for public buildings some artificial appliances were needed. The most potent agent in ventilation was heat. The lecturer urged that not only was the open fireplace wasteful in fuel consumption, but it could not maintain the claim often advanced on its behalf, that of being a healthy means of obtaining ventilation—the change of air effected by it was not caused in a manner most favourable to either comfort or health. In speaking of ventilation by the chimney-flue, the author mentioned that he had for some time past been experimenting, in order to devise a mode of transferring the heat of the vitiated air to the inflowing air which was to take its place. Although he had not as yet succeeded in perfecting an apparatus, he had reason to hope a good result might yet be obtained. The air to be introduced into a room should be obtained from as pure a source as possible; the air-ducts should be short and kept clean; inlets and outlets should be as large and numerous as practicable; direct currents from inlet to outlet should be avoided, and everything should be provided with a regulator easily accessible.

DRAINAGE.

THE fourth of the current series of Saturday afternoon lectures at the Parkes Museum of Hygiene was delivered last week by Mr. Rogers Field, B.A., M.I.C.E., who dealt with the subject of "Drainage." The lecturer observed that the essential principles of efficient drainage might be reduced to two—1st, that all foul matter should be rapidly and completely removed from the house directly it was produced; and 2nd, that there should be no back current of foul air into the house through the pipes and drains used for removing the foul matter. It was admitted by all that cesspools failed to comply with the first requirement, but the objectionable quality of the cesspool, that of retaining decomposing matter, reappeared in many of the traps that were daily being laid in our kitchens, sculleries, and closets; amongst these might be classified the dip, or mason's trap, the ⊃ trap, and the pan-closet. To show the necessity for making drains self-cleansing, and for giving a sudden flush, Mr. Field gave experiments with the simplest form of closet apparatus, and proceeded to explain the various modes of jointing drain-pipes. In conclusion, the principle of disconnection was explained, and the importance was insisted upon of having regular and periodical examinations of the drainage of a house by a well-qualified man.

CHIPS.

Weddington Church, near Coventry, a building re-erected in 1733, was reopened on Wednesday week, after restoration. New roofs of pitch-pine have been constructed, and fresh mullioned windows placed in the walls. The chancel floor has been raised and furnished with oak stalls for the choir, and with new communion-table and altar-rail. The pulpit and font have been set on stone bases, a chancel-arch erected, the nave-floor laid with Minton's tiles, and a new porch constructed. The work has been carried out by Messrs. Fox, of Atherstone, from the plans of Mr. A. W. Blomfield, M.A., of London.

The second section of the tramways through Ipswich was officially inspected by Major-General Hutchinson, on behalf of the Board of Trade last week. Mr. P. S. Bruff is the engineer. The line is a little over a mile in length, and connects the western suburb of the town with the main line railway station.

The church of St. Jude, Plymouth, is about to be completed, by the erection of a tower and spire at the north-west angle of the building, and rising to a total height of 120ft. The tower will be of three stages, constructed in tooled limestone, light and dark, with windows of Doulting stone; and the spire will be built in light limestone, with bands of red Mansfield and Portland quoins. Messrs. Hine and Odgers, of Plymouth, are the architects, and the work is to be commenced forthwith and completed by October next.

At the East Riding petty-sessions, held at York last week, James Ray, builder, of Darlington, was fined £5 and costs for having failed to comply with the by-laws of the rural sanitary authority. It was proved that defendant had erected buildings in Francis-street, Gate Fulford, which were deficient in sanitary requirements, and had also let them without obtaining a certificate from the rural authority.

The local board of Luddenden-foot, near Halifax, at their meeting last week, adopted plans prepared by Messrs. Utley and Gray, engineers, of Halifax, for the erection of a new iron bridge.

A new school in Amberley-road, Harrow-road, W., was opened by the Chairman of the London School-Board on Monday evening. The building has cost £5,358 for erection, and accommodates 360 boys and girls and 240 infants; the site contains an area of 22,000 square feet, and cost £14,228. The mixed department of the school consists of six separate class-rooms, each accommodating 60 children.

Messrs. Wm. Walker and Co., of Bunhill-row, have supplied the mahogany chimney-pieces, counter, and office fittings, also the stoves, with hand-painted cheeks and hearths, for the Standard Life Assurance Company's new offices in King William-street, City, which we described last week.

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ILLUSTRATIONS.

ROYAL ACADEMY TRAVELLING STUDENTSHIP DESIGN FOR A COLLEGE.—DESIGN FOR AN OAK CABINET FOR BOOKS AND CHINA.—ARTISTS' HOMES: "WEIRLEIGH."—ST. ANDREW'S PRESBYTERIAN CHURCH, READING.

OUR LITHOGRAPHIC ILLUSTRATIONS.

DESIGN FOR A COLLEGE.

THE design we publish to-day by Mr. Walter Millard, for which the Travelling Studentship of the Royal Academy has been awarded, was made in competition with others, at the Academy during the month of October. The conditions required accommodation to be provided for a principal, vice-principal, and 40 students, with a hall, chapel, library, lecture-room, kitchen, &c., on a site measuring 150ft. by 200ft. In this design the kitchen is placed under the hall, the floor of which is raised considerably above the level of the quadrangle and reached by an external flight of steps. The lecture-rooms occupy the upper part of the entrance-gateway. An open cloister, running round three sides of the quad, leads up to the residences of the principal and vice-principal, and affords covered communication from the gateway to all the students' staircases. From one of the inside angles of the cloister rises the tower, forming a groined porch to the chapel. The bird's-eye perspective has been traced for photo-lithography by Mr. Millard from his sepia drawing.

"BUILDING NEWS" DESIGNING CLUB.—AN OAK CABINET FOR BOOKS AND CHINA.

"JACK" is again the author of the selected design, the subject being a small cabinet for books and china. Plans, elevations, and a view are given, as well as details, together with an alternative design. The scales in all cases are given on the lithographic illustration of the designs which we herewith publish.

WEIRLEIGH, BRENCHLEY, KENT.

SOME few years since, Mr. Harrison Weir (whose drawings of natural history are known probably to a wider circle of the general public than the works of most artists) wishing to pursue his favourite study of animals and horticulture, erected on the steep hill-side of the road leading from Paddock Wood to Brenchley a small "cottage ornée" with detached studio. Afterwards desiring more accommodation, he carried ont the buildings shown in our illustrations. Advantage has been taken of the slope of the hill on one side, and the rising ground in the rear on the other, to increase the effect of the buildings and meet the difficulty of the levels. The two portions—old, etched, and new, shown as black—are connected together by a handsome staircase, which is carried up in the tower, and affords access to the various levels. The materials are red brick, with Bath-stone dressings, and weather-tiling on the upper floors. Black walnut, pitch-pine, and sequoias have been used in the staircase, and joiners' work to the principal rooms. The principal stoves are of Godstone stone only, no iron or metal-work being used. The architects are Messrs. Wadmore and Baker, of 35, Great St. Helens, E.C.; the builders, Messrs. Penn Brothers, of Pembury, Kent.

ST. ANDREW'S PRESBYTERIAN CHURCH, READING.

A SQUARE site necessitated a departure from the usual type of planning, and advantage was taken of this to produce a building practicall without obstruction to sight. A line drawn from the pulpit through the four columns only cuts across the passages to the seats. Some doubt was expressed when the design was prepared as to the acoustic properties of the building, but it has proved a perfect success. Sittings for 600 persons are provided on the ground-floor and in the end gallery, but these can be increased to 900 at a slight expense by the insertion of side galleries. The materials adopted are red bricks externally, and white ditto internally; Bath stone dressings, slating for roofs, and timber and boarding for the inner ceilings. All woodwork is of pitch-pine. The work has been well carried out by Mr. Filewood, of Reading, at a cost of about £4,500, under the superintendence of the architect, Mr. John Sulman, 1, Furnival's-inn, E.C. The drawing from which the lithograph was taken appeared in the last exhibition of the Royal Academy.

CELLARS, WATER-TANKS, AND RESERVOIRS.

IN the memoranda respecting materials issued by Mr. Robert Rawlinson, C.B., as an appendix to his "Suggestions" for main sewerage and water supply, some useful remarks are made on the construction of concrete tanks and reservoirs. It is recommended, for instance, that where concrete is substituted for brickwork, the concrete should be one-third thicker than brickwork, and the same rule is applied to retaining-walls. These, to be safe, it goes on to say, "should have cohesion and gravity equal, at the least, to four times the moving weight to be retained, and should have drains through their substance, from back to front, to permit of drainage and prevent any accumulation of water behind the retaining-wall." Experience in the construction of underground tanks, sewage and water receptacles, and even large basements, has been bought dearly in many instances, owing to the want of due precaution in excavating the site, in rendering the bottom water-tight, and in making it firm and unyielding to the water under pressure. It is useless to depend on a layer of clay-puddle upon a bottom of porous gravel or sand without a preparation of the surface, and for this purpose nothing can be safer than Portland lime concrete of sufficient thickness, which should extend under the side-walls of the reservoir or tank. In the construction of underground cellars in water-logged districts, the architect has to consider the conditions of stability required for a tank subject to pressure from below, and all round. If he fails to meet them, his employers suffer the periodical inflow of water whenever the soil is surcharged with rain, or the water-level rises. Many districts in London have suffered from this cause of late, and we think the attention of sanitary authorities should be directed to the subject of underground cellars generally. At present we find no attempt made in the smaller class of houses to exclude water from cellars; the brick-paving is laid simply on the bare ground, or it is covered with a thin coating of cement, and the walls are in many cases only one brick in thickness, without drainage of any kind. It is time some legal enactment to prevent the construction of underground cellars and basements without proper drainage should be enforced, as much misery and disease are due to the prevalence of basements which are no better than defective water-tanks. The best covering for a cellar-floor is undoubtedly a layer of asphalte on a bed of concrete; but unless the walls are also water-tight, the water will find its way through the joints and the brickwork at the bottom, to prevent which the walls themselves should be rendered with asphalte on the outside. There is little check to the intrusion of water, however, if there is no drain, and the effort of the builder should, in this case, be directed to making an underground tank, without resting satisfied with the power of the cement floor and brick walls to keep out floods. We know cases in which cellars have been tinkered and patched up year after year to no purpose, in ignorance of the fact that as the underground water rises the cellar becomes no better than a porous tank, and that the only remedy is to carry off to a lower level the surplus water by drainage, or failing this, to pump dry.

NEWBURY GRAMMAR SCHOOL COMPETITION.

THE following are the names of the authors of the most noticeable designs sent in in this competition. We attributed last week the design "Experientia" to Messrs. Giles and Gough, but this was a mistake of the official who gave us the information. "Experientia" is the design of Messrs. Newman and Billing. "Experience" was the motto of Messrs. Giles and Gough.

"Newbury" (quadrangular plan), Mr. Frank T. Bagallay, 19, Great George-street, Westminster; "Postulata," Mr. J. H. Money, Newbury; "Falkland," Mr. W. G. Lewton, Reading; "Utilitas," Messrs. Bromilow and Cheers, 6, Pekin-buildings, Harrington-street, Liverpool; "Experientia," Messrs. Newman and Billing, 185, Tooley-street, London-bridge; "Compass and Square," Mr. George D. Stevenson, 11, Alexandra-park, Hornsey, N.; "I Strive to Win," Mr. G. W. Webb, Reading; "L. S. D.," same; "Design with Beauty, Plan with Care," same; "Experto Crede," Mr. James Ledingham, Bradford; "Oxford and Cambridge," Mr. Fred. Robertson Kempson, Hereford; "Manners Makyth Man," Mr. Woodman, 2, New-road, Brighton; "School," Mr. J. Treadway Hanson, 5, York-buildings, Adelphi, W.C.; "Study," Mr. Alfred Williams, 22, Southampton-buildings, Chancery-lane, W.C.; 'Druid,' Mr. C. Bryan Oliver, 15, Great James-street, Bedford-row, W.C.; "Multum in Parvo" and "Nota Bene," Mr. Edwin Dolby, Abingdon; "1881," Mr. Alfred Drewe, Margate and Didcot; 'To Be or Not To Be," Mr. C. Martin Toombs, 5, Woodbine-terrace, Leamington: "'Twas in the Prime, &c.," Mr. W. H. Romaine Walker, 19, Buckingham-street, Adelphi, W.C.; "One Lives and Learns," Mr. H. Wilkinson Moore, Oxford; "Propria Quæ Maribus," Mr. J. Martin Brooks, 35, Wellington-street, Strand, W.C.; "Licet Mihi Appelere," Mr. G. Atkinson Barnes, Newbury; "Plan," Messrs. Bickerdike and Sugden, 2, Field-court, Gray's-inn, W.C.; "Experience," Messrs. John Giles and Gough, 28, Craven-street, Charing-cross, W.C.

PARLIAMENTARY NOTES.

SOLWAY BRIDGE.—In reply to Mr. Pease, Mr. Chamberlain said, on Tuesday, his attention had been directed to the destruction of a large portion of the Solway Bridge, and he had ordered a further inquiry to be made into the matter. It was a mistake to suppose that the Solway Bridge was of the same construction as the Tay Bridge, and that the failure might have arisen from the same cause. It was true that it was constructed of wrought-iron columns and lattice-girders, like the material of the Tay Bridge, but the application was widely different.

LOCAL EXPENDITURE OF LONDON.—Mr. Firth asked the President of the Local Government Board on Tuesday whether it was a fact that the Corporation of the City of London, and the London vestries and district boards, expended annually between three and four millions sterling, and that no part of the expenditure was audited by independent or skilled auditors; and whether he was prepared to initiate such measures as might be needful for the auditing by public auditors of such accounts. Mr. Dodson—The expenditure in question is about £3,000,000 per annum. The auditors of the vestries and district boards are elected under the Metropolis Management Act by the ratepayers out of the members of those bodies who are qualified to serve as vestrymen; but no professional qualification is prescribed for the office of auditor under the Act. I am unable to say how the auditors of the Corporation are appointed, but I rather think they are appointed by the Corporation itself. There does not appear to be any power to enforce disallowances by the auditors of vestries and district boards. At the same time, however desirable it may be that such powers should be conferred, and that duly qualified public auditors should be appointed, I am not prepared to undertake measures for that purpose this Session.

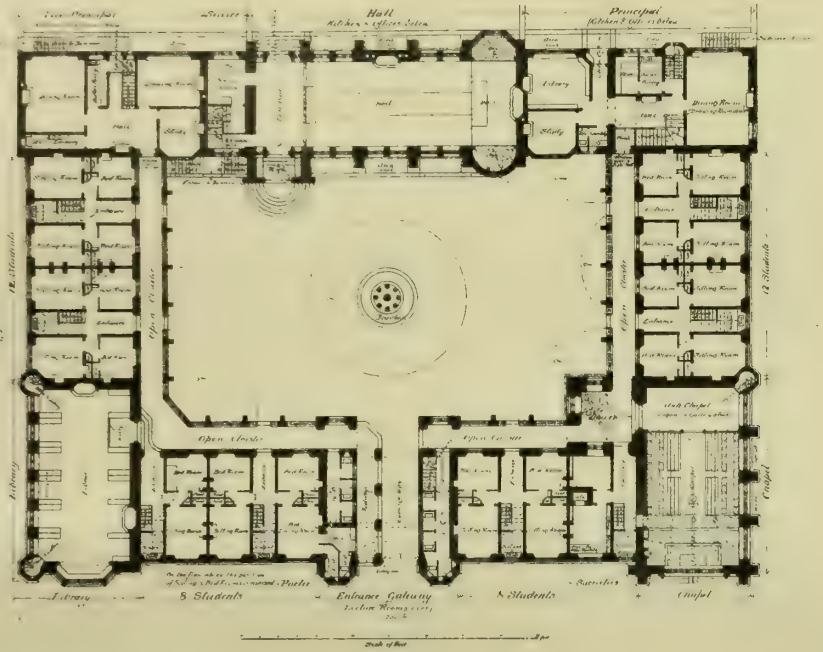
THE RIVERS CONSERVANCY BILL.—On the motion of Earl Spencer, in the House of Lords on Tuesday, the Select Committee on the Rivers Conservancy and Floods Prevention Bill was nominated as follows:—The Lord President, the Duke of Somerset, the Duke of Bedford, the Duke of Marlborough, the Earl of Derby, the Earl of Sandwich, the Earl of Jersey, the Earl of Camperdown, Viscount Bury, Lord Monson, Marquess of Huntly, Lord Penrhyn, and Lord Norton.

An industrial exhibition was opened at Wigton, by the Bishop of Carlisle, on Monday week, and will close to-morrow. The chief feature is a collection of obsolete articles formerly in domestic use in the Border district.

Royal Academy Travelling Studentship

Awarded to Walter J. Millard. Dec 1880.

Design for a College



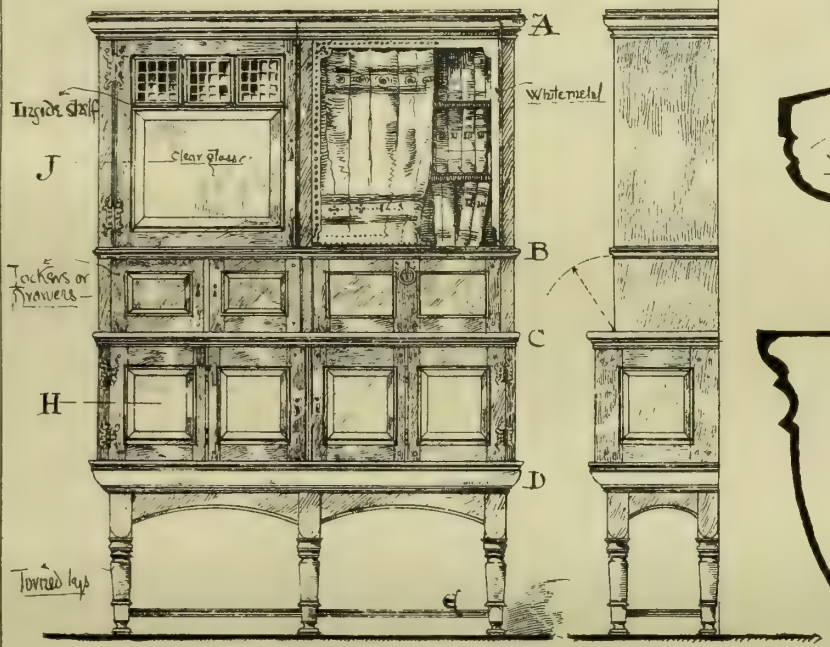
Front Elevation

Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

"Building News" Designing Club

An Oak Cabinet for Books & China.

The Hinges & Fittings, in White metal. "Jack"



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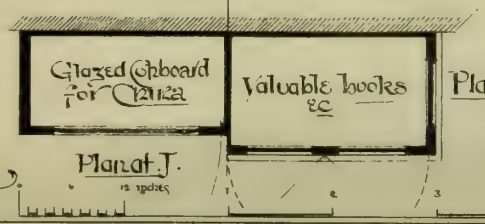
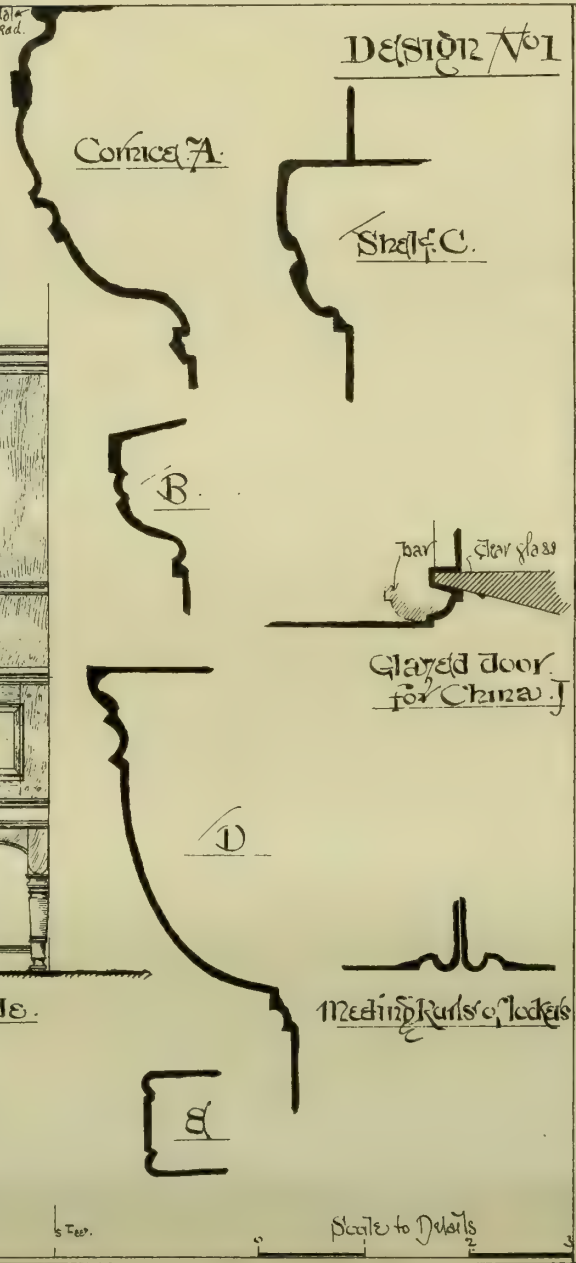


Design No 1



SELECTED DESIGN

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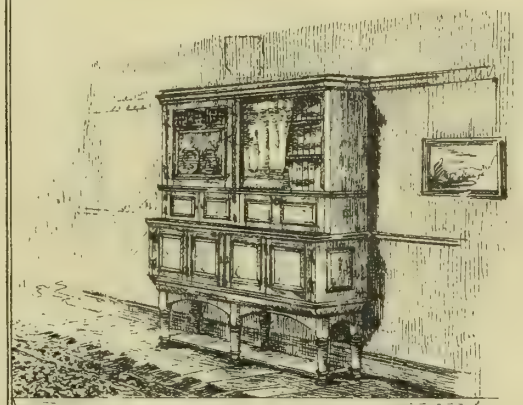

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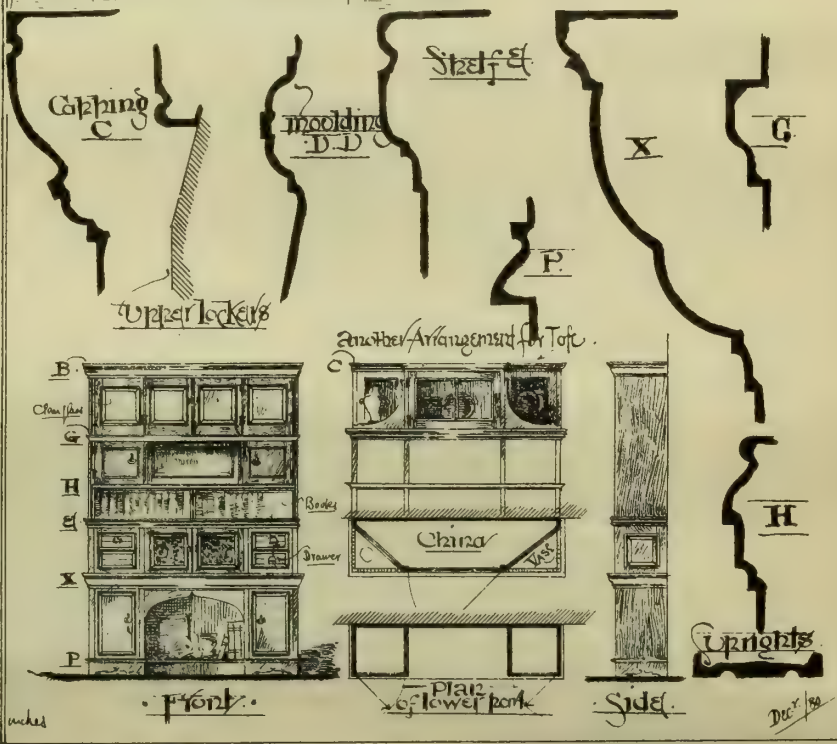
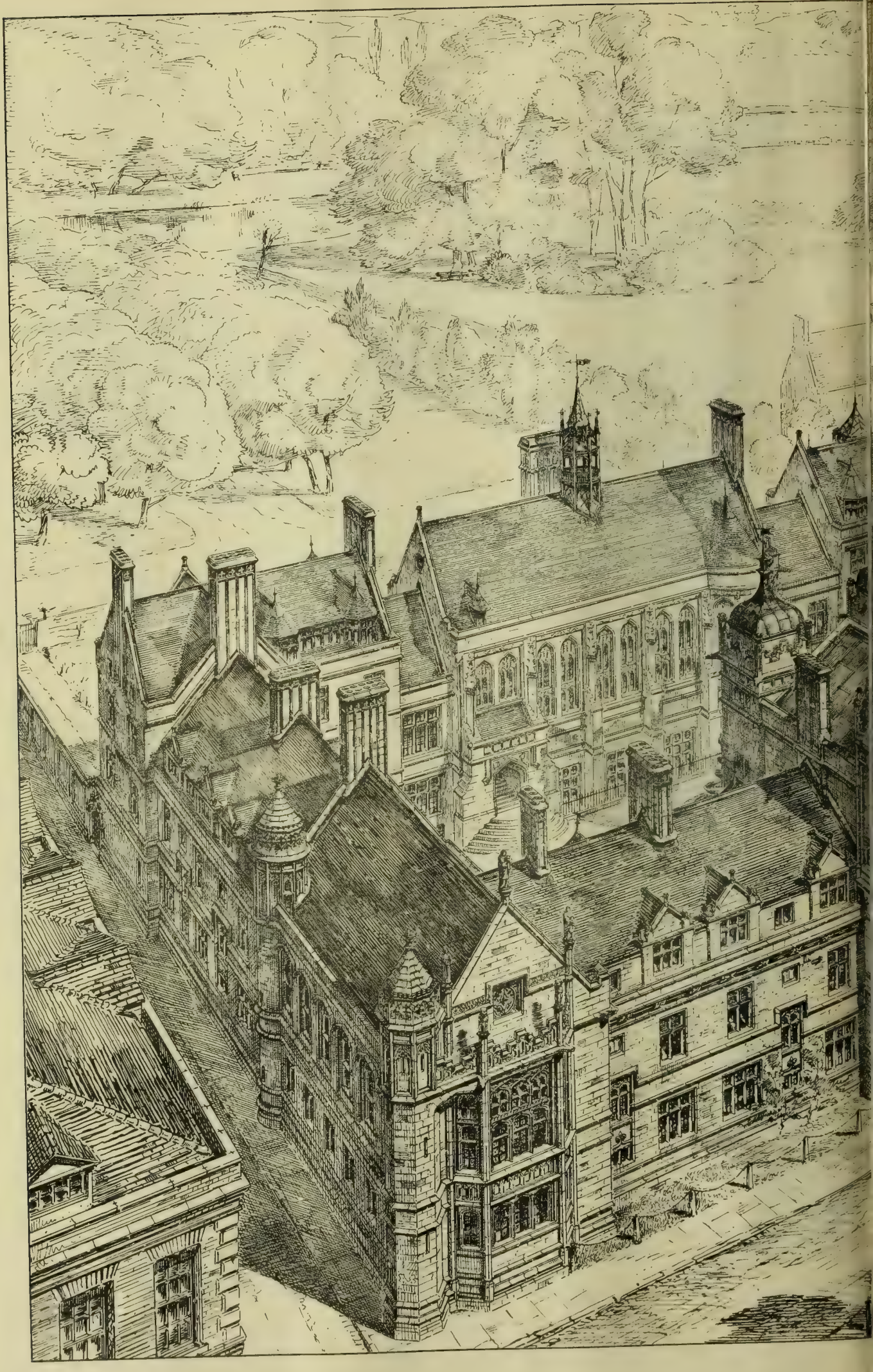
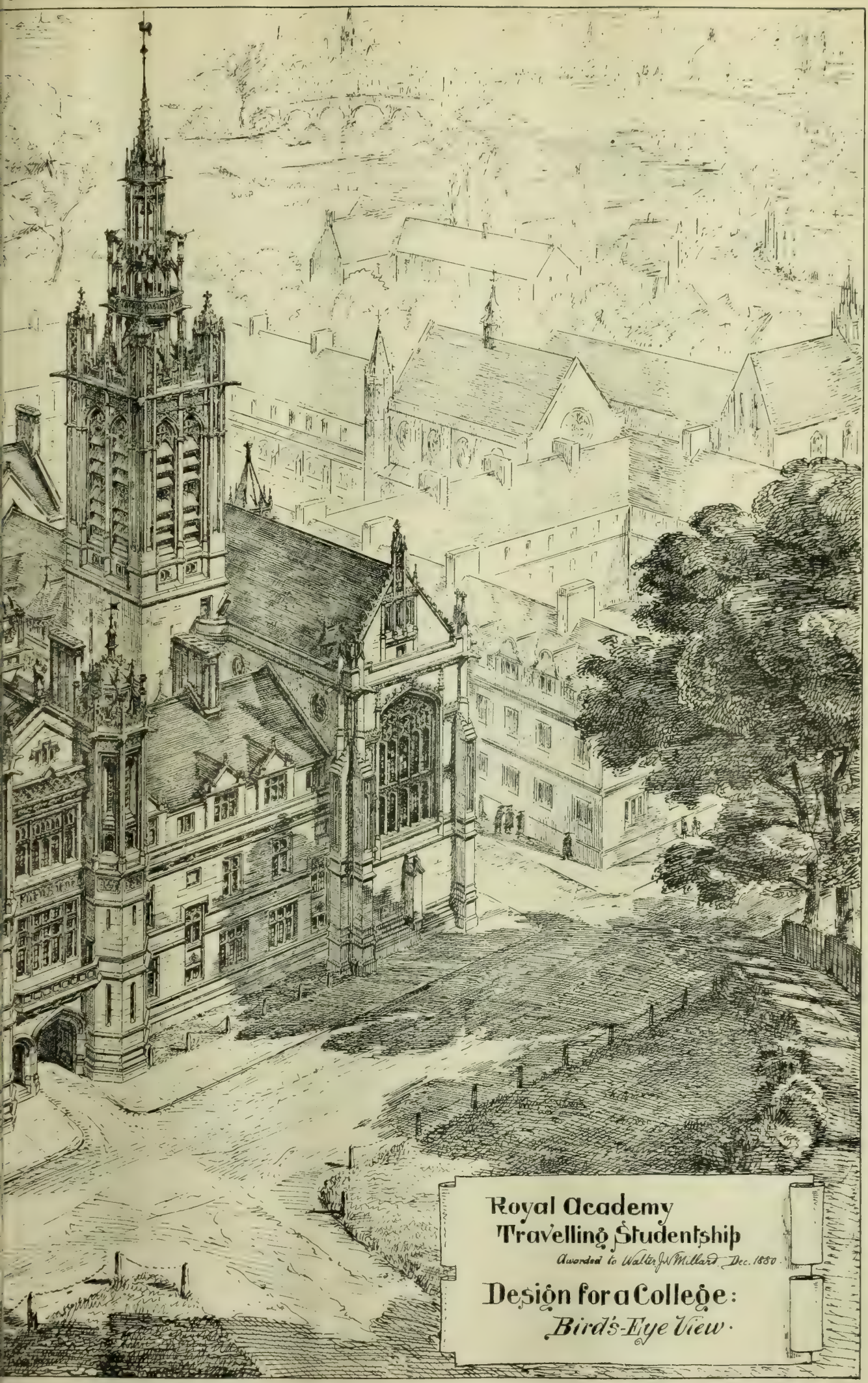


Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.





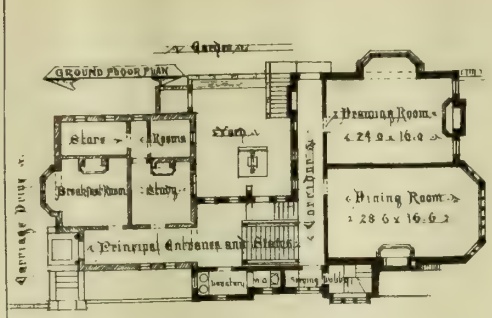
Royal Academy Travelling Studentship

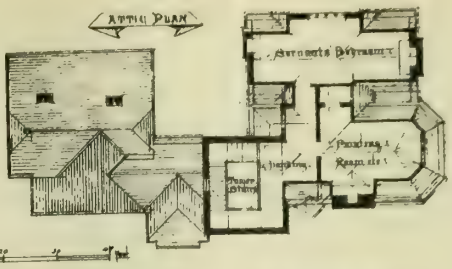
Awarded to Walter J. Millard Dec. 1880.

Design for a College:

Bird's-Eye View.

Photo Lithographed & Printed by James Akerman, 6, Queen Square, W.C.





ARTISTS' HOMES

NO 11

"WEIRLEIGH"

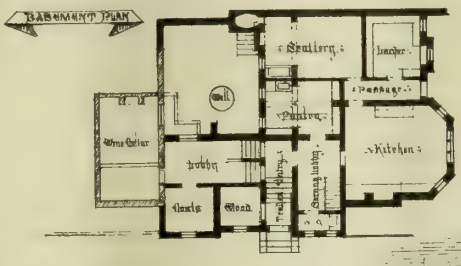
BRENCHLEY, KENT.

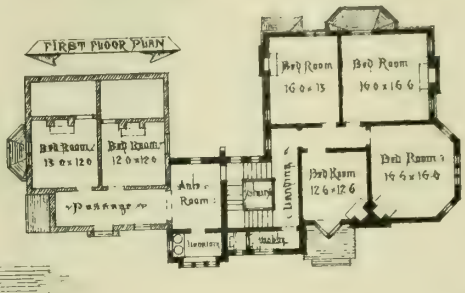
THE RESIDENCE OF

HARRISON WEIR ESQRE

WADMORE & BAKER

ARCHITECTS





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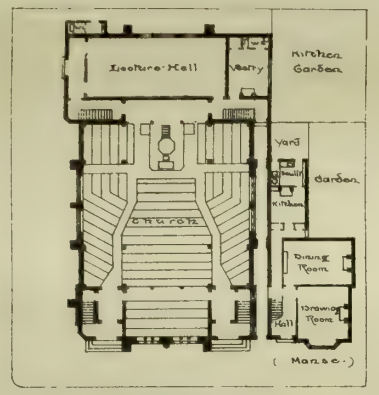

GROUND PLAN
Scale of 32 feet to 1 inch.

Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

St Andrew's Presbyterian Church, Reading:

John Sulman A.R.I.B.A. Archt
16 Furnivals Inn E.C.

THE PRESENT CONDITION OF THE ART OF WOOD-CARVING IN ENGLAND.*

CARVING in wood is as necessary to good architecture as carving in stone, and much more necessary. Many buildings that are not wanting in external dignity and even splendour, are finished from foundation to roof-ridge without the help of a stone-cutter, but are well fitted in the matter of wood-cutting within doors. The sole feature that gives interest to some old London houses is their carved wooden doorway and porch, *e.g.*, in Queen Anne's-gate, Westminster, and in some by-streets of the City. Wood-carving is the glory also of many of our old churches, for wood is the material with which churches, like houses, are finished. As regards architecture, we have lived to see two revivals in this century—the Pointed style, and now the Classic or Italian architecture, as naturalised here in England by Jones, Wren, and their successors. Both classes of building are absolutely incomplete without wood decoration. Architects have been in advance of carvers, and we see the exteriors of modern buildings far better understood than the interiors. Great exertions have been made by the late Sir G. Scott and other architects to train carvers of stone, but much remains to be learned and practised by the carvers of wood. We seem to have stopped half-way in our revivals, and as I wish to direct attention to a want that seems to me very serious, I must proceed to notice these revivals in detail.

Considering the rate at which the world moves, and the rapid changes of fashion, the Mediæval style has had a long reign. Now what part has wood-carving had in that revival? We have rebuilt the Houses of Parliament, and have just finished the new Law Courts, and have erected churches innumerable. In how many of the latter shall we see carved *miserere* seats, crocketed canopies, or carved shrines? What progress has been made in regard to the fitting up of civil architecture? The throne in the House of Lords is, perhaps, the best piece of work in the Palace of the Literature, but the general fittings of the building are devoid of interest. Now let any one walk into Henry VIIth's chapel, in Westminster Abbey, or that of St. George at Windsor, and imagine how dull and uninteresting either building would be without the stalls and canopies that rise 15ft. or 16ft. on either side. The stall-work of both belongs to a period of decay in Pointed architecture, yet what noble achievements in woodwork these seats and canopies are! The *misereres* have brackets which serve as a sort of seat when turned up. The brackets are supported by masks, grotesque figures, or animals, with foilage, gracefully turned. The designs are quaint, humorous, and always carved with spirit. The carvers have been their own designers, and have evidently taken pleasure in their work. Perhaps a certain amount of humorous quaintness is characteristic of all good carving, whatever the date or style. Our modern churches look cold and dull, even where great sums of money have been spent upon them, from want of this kind of furniture, once so general. Then, again, as to roofs; no structures could be grander than the great wooden roofs of the Middle Ages. Some were supported by king-posts, queen-posts, hammer-beams, and a forest of smaller supports: intricate, yet not without regularity and order: and always having figures of angels with outstretched wings on the ends of the hammer-beams. Perhaps such costly undertakings are scarcely to be hoped for in our times. Yet the hall of Lincoln's Inn, with a beautiful roof, was erected by Mr. Hardwicke 40 years since. With the exception of occasional restorations of college halls, I doubt whether we have followed the example set so long ago. Another fine form of roof or ceiling one would gladly see reproduced more constantly is that of square-panelling with carved leaf-work on the points of intersection. Most of the ceilings in modern churches, or in houses built in the Mediæval style, are merely panelled with rails moulded by the plane. Carved leaf-work of this kind—light, bold, broad, and sinewy—though it is not of extraordinary difficulty, cannot be added to ordinary panelled work, because of the cost. As we see it in old work, it is simple and coarse, but effective. It does not require an accomplished hand for its execution. Yet the quick, ready hands from which such work ought to be produced with ease and at moderate cost, cannot be found. In making such a statement, I feel bound to acknowledge the services to wood sculpture of Mr. Brindley and his pupils. He has restored stall-work and tabernacle work of all kinds. But such skill is confined to very few firms in London, Peterborough, and perhaps one or two other favoured cities. We have nothing like the amount of skill and talent in the wood-carver that we can resort to in masons and carvers of stone. If the Mediæval revival has not seen a lively and growing school of architectural wood-carvers, neither can we point to any solid achievements in modern and Mediæval furniture. One or two light and well-constructed pieces, such as sideboards, buffets, &c., have been seen in the great International Exhibitions. But in furniture, far higher accomplishments are required of the carver. If we are to go on building, fitting up interiors, and making Mediæval furniture, it is in the direction here indicated that we want training and practice. Something should be said as to the treatment of carved woodwork and carved furniture. Old work was partially gilded. In roofs where it had little light upon it, it was painted and gilt. It was never covered with glossy varnish, as so much of our modern woodwork is.

Let us turn now to the decorative woodwork of a later period—that purely domestic style which we call Elizabethan. It belongs, in reality, to the earlier revival in this country of Classic or Italian architecture. It was neither so artistic in outline, nor so fine in detail, as the art of the time of Henry VIII., but it was executed when the kingdom was more or less isolated from Continental Europe, and our style of architecture, and of the woodwork and sculpture that belongs to it, became national. It is the Elizabethan house, its interior panelling, its fanciful carving, and massive furniture, which has retained so great a popularity down to our own times. Country houses of this kind have been refitted, and others built in recent times, and we continue to build them still. All the woodwork of the old houses has a distinct and natural character. But it had this character owing to certain national prejudices, and to the difficulties that stood in the way of sending artists to Italy, to study in Rome or Florence. Nevertheless, builders and projectors of Elizabethan houses aimed at following the lead of the artists of Italy. Italian wood-carvers adopted the mouldings, capitals, brackets, arabesques, and leaf-work, which they found on ancient monuments. Though they borrowed these details from architecture, they modified, simplified, or multiplied them, according to their opportunities and the nature of the materials in which they had to work. In this respect, they did what wood-carvers had done for the Pointed style. The egg-and-tongue, the drip moulding, the ogee mouldings covered with leaf-work, had all been adapted to their service. But, in the hands of the earliest and finest carvers, an immense variety was introduced into these important elements of decoration. So also with capitals and brackets: the Classic acanthus was put to universal use. It was varied in ten thousand ways. Yet we recognise in all these Italian capitals, or brackets, or scroll-work, in which this leaf is used, the old type. We cannot but see, moreover, what a pregnant type of foliage it is, and how inexhaustible in its application, offering an endless field for variety, and yet preserving that unity which is one of the great principles of art. We must keep this Italian wood-carving before the mind, if we wish to understand that of our own country. The peculiar character of our own Elizabethan art was due to our firmer hold of old Mediæval ideas. The Elizabethan house was still surrounded by a moat. It had courts and gate-houses. The doors were old ledge-doors of massive oak, sometimes pierced with shot-holes. Then we preserved the old tradition of one vast room, or hall, to which withdrawing-rooms, and libraries, and galleries were offsets. The entrance was a passage panelled off from it, so that access could be had through it to the rest of the house. Over this passage a gallery commonly led from one side of the house to the other, still across this great hall. These panelled screens and galleries are richly decorated with carving of several kinds. A huge fireplace was provided on one side. The upper end was raised, and the handsomest seats were placed there. The walls were panelled with oak, to a height of ten or twelve feet. These noble halls are "the making" of the Elizabethan house, as they had been of the earlier Tudor houses, and of old castles, and manors, and granges, time out of mind. The architectural disposition, inside and out, was, in great measure, dictated by that of the old Pointed style. The Renaissance was adopted with enthusiasm, but the parts and details were fitted to a system of mullioned windows, pointed roofs, and Tudor arches. Builders expressed their thoughts in a borrowed language. The fireplace was put together over a Tudor arch, like all the doorways of the house. Round arches were of late adoption. The hall-screen had Classical columns, capitals, and brackets. Terminal figures, with Ionic capitals, supported the large and projecting cornices. Both in these large screens and the chimney fronts, the details are curiously mixed in character, but they retained to a great degree their abstract and conventional design. In the richest and best examples of screens and fire-places, figure sculpture is employed. Arabesque work was carved with spirit, and used to cover imposts, or panel surfaces, or coupled together and spread out into cornices, and the upper borders of continuous panelling. Another favourite element of decoration is that scroll work of flat relief, with bosses of turned and split wood at intervals, called strap-work. The cornices of chimney-pieces, or screen divisions, are often interrupted by work of this kind lapping round it, and passing over members of the structure above or below. It would seem to be an idea borrowed from ironwork of the middle ages. This strap-work, and the larger surfaces of it round heraldic scutcheons, borrowed, probably, from the notched and curled edges of boiled and stamped leather, are very effectively employed in Elizabethan woodwork. The furniture of this period has huge acorn table-legs, with gadroon ribs on the upper and acanthus leaves on the under surfaces. The same acorn shape, elongated, serves for stair-balusters, and for supports to sideboards and cabinet-fronts. Other notable objects of furniture are the bedsteads. The bed-heads are divided into recessed panels, and the tester is supported by huge acorn posts, sometimes by fluted columns, much diminished as they rise. Rude terminal caryatid figures are generally introduced into the bed-head. Most of the details of Elizabethan woodwork are meant to be Italian. The mouldings are partly run off from the plane, partly fitted in with billets or egg-mouldings, but worked, it must be remembered, by uneducated carpenters, joiners, and carvers. If we take Elizabethan carving detail by detail, it is full of faults, shortcomings, and inconsistencies. It aims at a graceful and beautiful ideal; but it is carried out—often ignorantly—as best it can be. We recognise in it a real character; it is full of strange and even grotesque incident, but it speaks the mind of its day. And this is what gives spirit, life, and meaning to good intentions in the artist. If we attempt to reproduce woodwork belonging to that period, we must do it with some spark of love for the interesting side of an age so remarkable; and of art, so full of inconsistencies, or, at least, of compound ideas. If, on the other hand, we simply copy this old work, and with labour and neatness follow its oddities, without knowing how to modify their art in our turn, as they modified Italian art in theirs, we do but reproduce the grotesque side of it. The neater, the smoother, the more mechanical the imitation, the more glaring become the faults of our work.

(*To be concluded.*)

* A paper read by J. Hungerford Pollen, before the Society of Arts, on Wednesday last, Feb. 9th.

CHIPS.

A transept has been added to the church of All Saints, South Lambeth, and was opened on Sunday week. Mr. Sidney Smith, A.R.I.B.A., was the architect; Mr. Shepherd, of Bermondsey-new-road, the builder.

At a meeting of the Hounslow Working Men's Club, held on Thursday week, plans of club premises prepared by Mr. Palmer, architect, were adopted, and the tender of Mr. Daniels accepted at £600 for its erection.

A new passenger railway-station is about to be built at Ladyship, near Halifax, West Riding of Yorks., from the designs and under the direction of Mr. John Fraser, C.E., of Leeds. The contract has been taken by Messrs. Charnock, of Halifax.

COMPETITIONS.

BURTON-ON-TRENT MARKET-HALL. — At a meeting of the Burton town council held on Wednesday week, it was, after a discussion, decided to rescind the resolution of November 9 last, awarding the second premium of 35gs. in the market-hall competition to the author of the design numbered No. 16. It was also reported that the proof furnished by the author of No. 8, whom the first premium of 60gs. was conditionally awarded, that it could be carried out for £8,250, was, in the opinion of the markets' committee, insufficient and unsatisfactory. It was resolved to re-award the premiums—the first, of 60gs., to the author of No. 10 design; the second, of 35gs., to the author of No. 19 design, and that No. 10 design be carried out, with slight modifications, under the supervision of the author, whose name did not transpire.

CARDIFF INFIRMARY. — The annual meeting of the governors of Glamorgan and Monmouth County Infirmary was held on Tuesday week at Cardiff, when a report was presented recommending that as the author's estimate of the cost of carrying out the design marked "Health" had been raised from £14,800 (or £126 per bed) to £23,000 (or £221 per bed), whilst that for the design known as "Tria Juncta in Uno" had been fixed at £21,048 (or £210 per bed), the governors should appoint the authors of the latter design, Messrs. James, Seward, and Thomas, of Cardiff, as their architects. This was adopted, and Messrs. James, Seward, and Thomas were formally appointed architects, with instructions to modify their designs in accordance with the suggestions of the London professional referees and the medical staff; but not to exceed the original estimate without consulting the governors afresh. It may be mentioned Mr. W. Nash, F.R.I.B.A., and Captain Douglas Galton, C.B., F.R.S., were the referees, and were appointed more than four years since. Seventeen plans were submitted, of which "Health" and "Tria Juncta in Uno" were bracketed first and the premiums divided.

MASONIC HALL—CLUB PREMISES AND SHOPS' MERTHYR TYDFIL.—In response to invitations to architects, about 20 sets of drawings were submitted in the above competition, some of which, as usual, it was estimated could not be carried out for twice the sum proposed to be expended; but of the three selected for further consideration, the choice was eventually given to a design bearing the motto "Plain and Practical," by Messrs. Wing and Johnson, London and Abergavenny, Mon. This design was illustrated by a well-drawn perspective. Two well-considered sets of plans were sent from Liverpool, and others from London, Bath, Aylesbury, Clifton, and South Wales.

ROCHDALE.—In answer to their advertisement the Rochdale School Board have received designs from 38 architects for their new school at Harelands, and after various meetings reduced them to 7. The following are the mottoes of the seven:—"Utility" (3 sets), "Comme il faut," "Choose well: your Choice is Brief yet Endless," "Knowledge is Power," "Practice makes Perfect," "No. 3507," and "Experentia." The conditions specified a mixed school, with infants' department, to accommodate 500 scholars, the cost not to exceed £5,000. One of the authors estimates the cost of his design at £3,500, or £7 per scholar.

CHIPS.

The City Lands Committee of the Common Council are in favour of the Temple-bar Memorial being undisturbed at present, and a report to this effect is, it is said, to be read at the meeting of the council on the 15th inst. On the other hand, the *City Press* intimates that while the Memorial will remain, it appears highly probable that the griffin will be removed, and some other heraldic device substituted.

The Commissioners of Northern Lights have decided to erect two new lighthouses on the southern shore of the Firth of Forth: the one at Dunbar and the other on Fidra Island.

A new chapel was opened at Haslingden on Thursday, January 27th, for the United Methodist Free Church. Messrs. Potts, Pickup, and Dixon, Manchester and Oldham, are the architects; Messrs. Williams and Hope, of Dinting, near Glossop, contractors for the masonry and brickwork. Local men executed the other work. Total cost, £4,200.

Building Intelligence.

CRUDWELL.—All Saints' Church, Crudwell, was reopened by the Bishop of Gloucester on Tuesday week, after works of restoration, effected at an outlay of £1,200. The fine 15th-century tower, which was in a dangerous condition, has been buttressed and secured with iron ties; its walls have been underpinned and buttressed, the crushed arches have been removed and replaced, and a relieving arch has been built across the west end of south aisle, screening off a baptistery, and affording support to the tower. The stucco-work has been removed from the exterior, and the walls have been repaired and pointed. The common roofs and plaster ceilings with which, 50 years since, the Perpendicular open roofs over nave and aisles were replaced, have been removed to make way for others more in accordance with the fabric. The west front, first west bay, and east front of south aisle have been taken down and rebuilt, stone for stone, the chancel roof has been retiled, and the floors throughout the church made good. Messrs. Waller and Sons, of Gloucester, were the architects, and Mr. Clutterbuck, of the same city, was the contractor.

DARLINGTON.—The Wesleyan chapel at North Cowtace, near Darlington, has been reopened, after being temporarily closed during alterations. The old-fashioned pews, pulpit, and other framing, have been removed, and replaced by new open benches and rostrum. The position of aisles has been altered, wall cleading carried round the chapel, new entrance-doors provided, and a thorough system of ventilation adopted. Mr. Fred W. Brooks, Darlington, was the architect appointed, and the alterations have been most satisfactorily carried out by the North of England School Furnishing Co., Darlington.

PLYMOUTH.—A new malt-house has been erected at Plymouth for Messrs. Pitts. The malt-house covers an area of over 6,450 superficial feet. It is four stories in height, and is substantially built of rubble limestone, with brick dressings to the door and window openings. The kiln floor has an area of 1,400 superficial feet. The cost of the reconstruction will be upwards of £3,000. Mr. Charles King is the architect. Mr. A. R. Letbbridge is the contractor; the joiners' work has been executed by Mr. May; Messrs. Colling and Hocking have been entrusted with the plumbing; Messrs. Rownson and Drew, of London, have supplied the wrought-iron work for the kiln floor, and Messrs. Willoughby Bros., of Plymouth, the cast-iron columns and girders.

WIGAN.—The erection of St. Joseph's Seminary, the foundation-stone of which was laid last year, is making progress. The site is about four miles N.W. of Wigan. When completed the building will form a quadrangle, the sides of which will be about 220ft. in length. At present, however, means will not permit of more than the north and east wings being built, the former of which will be 220ft. by 41ft.; the latter 222ft. by 37ft. These two wings will include temporary chapel, refectory, lecture-room, class-rooms, thirty-six rooms for professors and students, infirmary, ambulacrum, and, above these, two large rooms extending the whole length of the wings, which can be adapted as dormitories, if needed. All the external walls are built with carefully dressed stone, of excellent quality, quarried on the seminary grounds. The plans have been prepared by Mr. James O'Byrne, and the building has been intrusted to the firm of Messrs. Roberts and Robinson.

St. Margaret's Church, Lothbury, has just been closed for entire reconstruction internally, the proposed works including the removal of galleries, replacement of old oak pews by open benches, relaying of floors, lowering of pulpit and reading-desk, and enlargement of the organ; the last-mentioned work has been taken by Messrs. Bryce and Son.

The local board of Exmouth on Wednesday week, after considering two rival schemes for the disposal of sewage, instructed Mr. Martin, of Exeter, to prepare fresh plans for sewering the town, with an outfall at the north end of the docks.

The new University College at Nottingham is approaching completion, and will be opened by Prince Leopold in June or July next.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

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N.B.—Cases and vols. must be ordered through a bookseller or newsagent, as the regulations of the Post-office prevent them from being sent by post.

RECEIVED.—W. L.—H. and Co.—J. L. B.—D. and Co.—W. H. L.—J. P. M.—C. Bros.—D. M.—J. M.—E. and Co.—M. Ry. Co.—J. B.

D. J. M. (Try at Batsford's, 52, High Holborn; but we are afraid you will not be able to get a really good book. We know of none.)—C. T. (Our remark on your plan was not made inconsiderately, but after comparison with others. What we meant by "plan incoherent" was that there was a want of connection, and the corridors were too long. No remark was made on the size of schoolroom.)

"BUILDING NEWS" DESIGNING CLUB.

LIST OF SUBJECTS.

A. A cottage hospital for eight beds, for sick of both sexes, with provision for infectious cases, and with necessary offices and appurtenances. Proper floor space to be allowed, and attention to be given to ventilation and warming. Plans, elevations, and sketch. ⅛th of an inch to the foot.

B. Details of a wooden verandah, and entrance doorway to the above. Inch scale.

DRAWINGS RECEIVED.—Nil Desperandum No. 2, Nemo, H. C. in circle, Good Luck to Your Fishing, Ogmore, B. J., Con in circle, Motto A., Hubert. York, Beta, Ambition, Lancaster, Bonus Hominus (will do), In hoc Signo Vinces, Alpha, Arnold.

Correspondence.

THE INSTITUTE EXAMINATION.

To the Editor of the BUILDING NEWS.

SIR,—The letter of "Desideratum" in your issue of 28th ult. indicates a strange want of knowledge on the part of one apparently so anxious to exclude about three-fourths of his fellow-professionals from practising their calling.

He must surely be aware that it is not within the power of anybody in this country to grant licences or diplomas under any circumstances for the exclusive carrying on of our profession.

The utmost that is proposed is that the R.I.B.A. should make admission to their body contingent on the passing of some sort of test of fitness, instead of as at present merely by ballot or election. The only effect of this would be to give somewhat more standing to the members of the Institute—a matter that the public will, of course, take "quantum valeat."

The Institute has no power, any more than the Royal Academy, to regulate the terms or practice of members of its profession. Any diploma or credentials it may grant cannot affect anyone outside its own circle. Indeed, the issue of a diploma that, either directly or constructively, implied that its holder had a right to practise not accorded to other parties would be an infringement of the charter of the society, and I may add, for the information of

"Desideratum," that a pretension of the kind would be actionable at law, as an interference with the liberty of the subject.

It would serve no useful purpose to discuss here the point as to whether our profession should be an open or a limited one—there is much to be said either way, and I am giving no opinion thereon. But the time has not come for the solution of the matter in the sense your correspondent assumes when he talks so glibly of *immediately putting down* a few thousands of his fellow professionals. It will require the consent of the Legislature for this, and that will never be accorded on demand from any professional or any society; but must follow the strongly-urged demand of the *public*, who will have to be educated to see the necessity of this change.

And most assuredly the public will never be brought to see this from the point of view so undisguisedly presented by "Desideratum," that is, the limitation of practice to a select few, coupled with what he hints at, the power of preventing competition in their charges.

At present, rightly or wrongly, the public find their account in the extreme competition of professionals, and judge themselves better served by the energy and skill which this strain evokes, rather than by the talents of a select and independent few.

There is one point that I think many overlook, that is, in case of any diploma needed for practice, our Government will assuredly entrust their own Department of Science and Art, to wit South Kensington with this, not the R.I.B.A.—I am, &c.

3rd February. B.

BUILDING-STONES.

Sir,—An article in your issue of January 28th, on "Specific Gravity of Building Materials," has just come under my notice. I have not studied chemistry or other scientific subjects except in a general way; but I have some practical knowledge of building stones—thoroughly understand the qualities of some of them—and have always been accustomed, since I was capable of observation, to notice the characteristics of any stone which came in my way. The writer of the article I refer to lays it down as an axiom, that the higher the specific gravity of a stone, the more durable it is likely to be. If this were the case, granite would, of course, be far more durable than the best description of the lighter oolites. In proof that this is not the case I may mention the fact referred to in the Building News of Oct. 15, 1880. The old church of St. Mary, at Truro, had just been taken down, and although the granite spire had been built "little more than 100 years," the angles and various surfaces of the ashlar were eaten away to the extent of half an inch or more." I have come to the conclusion, therefore, that high specific gravity does not necessarily prove a building stone durable.

But I do not write to call attention to this matter only. The writer of the article speaks highly of Ancaster and Portland oolites. "The latter," he says, "has the higher crushing strength, owing probably to its containing a small proportion of silica, which is absent from the composition of other English oolites," and to this also he attributes its durability. Now this shows that the writer has not made any extended inquiries, and I beg to inform him that the Doulting oolite contains 2·04 of silica while the Portland contains only 1·20. Although I am the lessee of the Doulting Quarries, I hope, Sir, you will allow me to add this question to the writer of the article. Does he—does anyone else—know of any building in England of equal age showing so little decay as the ruins of Glastonbury Abbey; the St. Joseph's Chapel dating from the twelfth century?—the whole of which is built of Doulting stone. There is no more important quality in building stone, if its chemical properties are good, than homogeneity in structure—the colour will then be uniform.—I am, &c., Charles Trask.

Norton-sub-Hamdon, near Ilminster.

February 7.

LIVERPOOL SCHOOL OF ART.

Sir,—We have not had opportunity of seeing how this competition was decided till the illustration appeared in your last.

It is clear that one main essential stipulation has been ignored—viz., the north lighting of the principal room, the First Antique. This was a matter on which we were allowed no option, and it cost me many a tedious hour in trying to arrange these rooms for the north light.

I note the accompanying descriptive notice in yours states this large room is north-lighted, with the addition of an extra light to the east; the fact being that it is lighted directly from the east with a supplementary light only from the north. I suppose it may be said that this is the same thing. Is it so? A room north-lighted means a room with its main or sole light from the north, and this is 52ft. long and only 25ft. wide. Really the north light here is not wanted at all, and evidently put in order to suit the elevation, or possibly to give an apparent compliance with an essential stipulation.

It will thus be evident why the suggested reference to a professional umpire and a public exhibition of the plans were so cavalierly denied to us. A matter like this could never have been overlooked if pointed out at the proper time, and backed by public comment.

We have a "true bill" against the School of Art, and its first lesson is an instructive one.—I am, &c., A Competitor.

February 5.

Sir,—Thanks to your courtesy, the other competitors and myself have the opportunity denied us by the committee of seeing the plans to which the first prize was recently awarded, and, by your leave, I will now compare the arrangements thereof with the instructions issued for the guidance of competitors, and the additions thereto made by the secretary and head-master during interviews with them.

1. The conditions expressly say, that all requirements set forth in italics "*must be literally complied with*," and in italics it is as plainly stipulated that "*That the two antique rooms, the painting, life class, and head-master's rooms must be lighted from the north*," whilst the importance of this was further urged by the head-master, who, on courteously showing me over the present art school, specially pointed out the evil of light being admitted on *more than one* side of a class-room; to overcome which windows were boarded up in some cases, and in others curtains were used to minimise the difficulty of cross-lights. Judge, then, my surprise to find all these vital points simply ignored in the first prize plans, in which the antique-rooms are lighted by three windows from the north end, and *six side-windows having three other aspects*, whilst the life-room has *three* windows to the north, and *one to the south*, setting aside the instructions issued by the Science and Art Department, London, which plainly require such rooms to be "lighted from the *north side* by *a single large window*"; departures from instruction on vital points which disqualify the plan, and reproduce, on a larger scale, the evils of the existing school.

2. It was also stated to me that, whilst the style was left to the competitors, harmony with the present building would be preferred, so as to make one complete structure in effect (hence, the wing of the old building was published with the instructions), and it was further pointed out, as important for the sake of economy, that both old and new schools should be workable by the present staff, and from the present office. Again, judge my surprise to find these points also utterly ignored in the plan of the committee's choice.

Other points lie invitingly open to criticism, such as the communication between the two schools, but I will confine my remarks now to the actual departures from instructions and admitted principles of art school lighting; and these being so glaring, seem at once to account for the committee's effort to stifle criticism by refusing to exhibit the drawings submitted in competition, and compel us to the decision that if the selected plan was the best of the 86 sent in, the result is far from flattering to the profession, whilst if it is *not* the best, the selection is discreditable to the managers of an art school.—I am, &c. A Competitor.

EXTERNAL SOIL-PIPES.

Sir,—In reply to Mr. Wm. White, F.S.A., p. 140, as to why I asserted that "a soil-pipe placed outside *generates and discharges into the air* far less sewage-gas than one fitted up inside," I may observe, first, that I am rather astonished that a professed sanitarian like Mr. White should require to ask that question. As to *proof* of such being *the fact*, let a person go into a privy upon a cold or frosty day, and then little or no bad smell may be felt; but go into the same place upon a warm day, and the smell will be disgusting. Then as to soil-pipes, go up to the roof and apply the nose to the top of an outside one, and then to the top of an inside one, when, ten to one it will be found that the stink of the latter is very much in excess of that of the former. Further, apply an anemometer to each, and again ten to one that the speed of the current outwards from the inside one will be several times that from the outside one, consequently my "assertion" is proved as above stated.

The greater "warmth" and "heat" which Mr. White himself says the inside pipe gets, are the factors which tend to the production of the greater quantity of sewage-gas.* The quicker passage of the air through the soil-pipe somehow does not prevent this, as said air gradually gets warm in its course, and the longer the soil-pipe, the more does the passing air get loaded with sewage-gas from off the stinking putrefying matter adhering to the interior of the "warm" inside soil-pipe. This is one of the reasons why I wish soil-pipes to be *outside*, viz., because that a leak outside will likely do no harm to the inmates; but a leak inside, and especially from a hole in a long soil-pipe means poisoning to the breather of the foul air from the leak, said poisoning being slow or quick, according to the state of the breather's body, and the amount of disease-germs in the foul air or "gas."

Mr. White says his inside soil-pipe was all right during this frost. Now mine (I am only a temporary tenant in the house) in the middle of the house was frozen up for a fortnight, while my sink, 40ft. from ground, and discharging into an outside pipe, was used during the whole of the frost. It was coated with ice, but that did not disturb anyone that I know of.

A severe frost like this may not occur for many years, so, in this country, to put a soil-pipe of any length inside, merely for fear of frost, is, I consider, foolish.

There are thousands of people now in their graves who might still be living had it not been for breathing the bad air from soil-pipes, and many before the end of this year of grace, A.D. 1881, will be sent there *before their time* from the same cause. Some people blame "Providence" for this: I blame the Government for a good deal of it, and the public for most of the rest.

As to Mr. White's idea of protecting the external soil-pipe "by a casing of *brickwork*," I fear that would be rather clumsy-looking. It reminds one of the tower of Babel, and might cause confusion by suggesting the idea of a chimney for a subterranean wash-house. Now, although I have dabbled a little in antiquarian lore myself, I really think a neat wooden case would serve the purpose far better, and would be cheaper as well as handier, and more appropriate.—I am, &c.,

W. P. Buchan.

Sir,—It seems to me very desirable to obtain evidence of the behaviour of external soil-discharge arrangement during the late prolonged and exceptionally severe frost. We have been informed hitherto that not a single instance of freezing-up has been known to occur; yet it seems to me that, be the soil-pipe outside or inside, some of the new forms of traps used which receive the soil-pipe at the foot and ventilate by a grating to the ground (such as Stiff's and Weaver's) must, unless fixed pretty deep in the earth, be very liable to freeze and bring on a state of things such as given by Mr. White.

Again, it seems desirable to know if the freezing of water in the pan or dish of apparatus has taken place as frequently as one would expect with the open system.

I would, with your permission, invite correspondents to relate some of the lessons which I feel confident the last frost has been able to teach us.—I am, &c. A. C. G.

February 9th.

NEWBURY GRAMMAR SCHOOL COMPETITION.

Sir,—Allow me to offer a few remarks on your review of my design for the above school. I admit that the schoolroom might with advan-

* Warmth, or a medium heat is favourable to putrefaction; cold is unfavourable.

tage be a little wider; but its area gives 5·2 square feet per scholar when the 200 are assembled in it, and as the nave of a church, arranged in the usual way, generally requires 5·5 to 6 square feet per adult, including passages, I think no inconvenience would arise from crowding in the schoolroom. The sum named by the trustees, £7,000 for the whole building, rendered it necessary to avoid extravagance. The estimate did not state the value per foot cube of the various parts of the building; these might be useful in comparing with other plans. They are:—

For school and classrooms, &c., dining-hall, kitchen, &c	7d.
Dormitories and accessories	6½d.
Headmaster's house	7½d.
Laundry, washhouse, and out-offices	6d.

I have not the plans to refer to: but I believe the dormitories provide a minimum of about 700 cube feet of air for each occupant.

The assistant-master's bedroom is said not to afford the requisite supervision over the two dormitories which are placed at right angles over the school-end of the building. Bearing in mind that for this purpose, practically, the relative positions of apartments are the relative positions of their doors, another reference to the first-floor plan would show that the doors of these two dormitories are both in full view of that of the assistant-master's bedroom, and quite as near to it as the door of the dormitory on the other side.

The planning of reception-rooms is a matter about which I suppose there may be varied opinions; but a day- and a night-nursery certainly seem desirable in a house that may be occupied by a head-master with a large family of young children; and I think that the laundry and washhouse are best placed at a considerable distance from the house and school; their being added beyond the out-offices has given rise to the long low wing to which I think you seem to take exception.—I am, &c.,

Chas. H. M. Mileham.

114, Gower-street, W.C.

Sir,—In the critique given by you in your impression of last week, having reference to above competition, I notice that my design "Experientia" is set down as being "we are told the design of Messrs. Giles and Gough." Allow me to state that such is *entirely incorrect*, and should be that of Newman and Billing, Tooley-street, London-bridge. I presume that as you desire to be correct in all your reviews, you will do me the favour of stating its right authorship and you will greatly oblige.

At the same time, allow me to thank you for so favourable a criticism as that you gave. My late partner, Mr. Newman, has now been dead some years, but I retain the old name for a time longer.—I am, &c., Arthur Billing.

185, Tooley-street, London-bridge.

SHEFFIELD PARISH-CHURCH FONT.

Sir,—I was in perfect ignorance of any letters on the above subject having appeared in your paper until within the last three days, when one of the competitors gave me the information, together with a rough idea of their contents. Allow me to say that, as soon as the selection was made (which, from unavoidable causes, was not until some six weeks after the designs were submitted), I employed a person accustomed to such work to pack up and return, carriage paid, all the drawings submitted (70 in number), inclosing in each package a letter of thanks, together with the names of the successful competitor (Mr. Chas. Green, Sheffield) and the receiver of the £5 premium (Mr. Anthony Welsh, Leeds). I do not know that more could reasonably have been expected.—I am, &c,

Ensor Drury, Hon. Sec.

24, George-street, Sheffield, Feb. 8.

[The competitors, doubtless, reasonably expected the usual announcement through the professional journals.—Ed.]

THE MANAGERS OF METROPOLITAN BUILDING.

Sir,—The article in your issue of last week, under the above title, appears to me to convey an erroneous impression, as there are no "Managers of Metropolitan Buildings": a manager being one who controls; whereas the Building Act only authorises officials to supervise or look over works after they are done.

The article speaks disparaging of the narrow capacity, culture, and ability of "district surveyors." The following facts are, I submit, a complete answer to this remark:—There are 65 district surveyors in the metropolis: 39 of them are Fellows of the Royal Institute of British Architects, and 10 more are Associates; the president, Mr. Whichcord, is a district surveyor, and several of them are also members of the council. Every candidate, before being appointed to the office, is compelled by law to pass an examination at the Institute; and, strange as it may appear, the district surveyors of London, and candidates for the appointment, are the only persons in the British Empire who hold any diploma as to their capability to practise as architects; and this fact is so well known and recognised in courts of law, that it adds considerable weight to their evidence as witnesses. Generally about two-thirds of the candidates offering themselves for certificates, after examination, are rejected; and if it is objected that the test is not severe enough, this is now remedied, as the Council of the Institute who conduct the examination have recently arranged with the Metropolitan Board of Works to raise the scale of proficiency, and charge fees to pay the examiners. The article further speaks of "the want of high capacity, refinement, and consideration, &c., of district surveyors." I submit the statement is most unfair to a body of gentlemen who are, many of them, the *élite* of the architectural profession. Can it be applied to the President of the Institute, and such well-known names as Professors Donaldson and Kerr, Messrs. Edward I'Anson, F. W. Porter, G. Atchison, Edward Woodthorpe, T. Roger Smith, Charles Forster Hayward, Charles Fowler, and many others of similar character? or, taking the junior and rising members of the profession, is it true of such men as Thomas Henry Watson, T. Clarkson, Thos. Blashill, Douglass Mathews, Rowland Plumbe, and many others who have won reputation and fame at the Royal Academy and Architectural Association, and by well-known works they have executed? Surely the writer of the article has never even perused the list of district surveyors, the mere consideration of which testifies to the conscientious and honourable manner in which the Metropolitan Board of Works have, without favouritism, almost invariably selected from amongst the numerous candidates those men who have already proved their capacity. The article then speaks of "the possibility of mal-practices as regards fees," and suggests "that district surveyors be paid by salary."

Every district surveyor is compelled by law to make a correct return of the fees received by him every month to the Board of Works, and, as they are paid on a fixed scale, I fail to see how mal-practices can arise, and anyone conversant with the difficulties of dealing with speculating builders must know that *they* are the last persons to offer a bribe, their usual course being to set the law at defiance, and refuse to pay fees till forced to do so by legal process. It is simply impossible to pay district surveyors by salary. It would be most unfair to tax the whole community to pay for the official inspection of work done by builders, and contrary to reason and all legal precedent; and, while the fees in a district may amount to £300 in one year, they may, by the stoppage of building operations, drop down to £50 in the succeeding one; again, it is simply absurd to say that district surveyors should not be allowed to carry on private practice. It should be remembered that district surveyors merely supervise works, and neither control nor direct them, and almost all the official supervision throughout the kingdom as regards medical, legal, and general matters is, and must be, conducted by men holding a high position in their several professions, who, in their own practice, daily grapple with the difficulties of their practice, and no one is fit to have the official supervision of large and important works but architects who have themselves executed and directed such on their own account, and are, therefore, fully conversant with the difficulties and technical details connected with them.

The writer further insinuates "that district surveyors wink at the doings of speculative builders, while they visit with rigour the work executed in public buildings designed by architects." Here, again, he is mistaken.

With respect to public buildings, the law compels builders to carry them out to the satisfaction of the district surveyor, and the frequent occurrence of accidents in the metropolis and elsewhere has proved the necessity of this salutary rule; but as regards speculative houses, there is no such power, and if the walls are the proper thickness, and the legal precautions to prevent the spread of fire observed, the district surveyor has practically no power unless a house is so wretchedly and badly built that he can induce a magistrate to condemn it as a dangerous structure. The latter plan is now frequently adopted. There were over 3,000 dangerous structures condemned in the metropolis last year, averaging about fifty to each district surveyor. It is quite true he may perhaps get a scamping builder occasionally fined, but the fines generally inflicted are so slight that it pays builders to run the risk, and, if convicted, pay them; for instance, a magistrate who has just fined a tradesman £10 for adulterating a pint of milk or pound of coffee will let off a scamping builder who has erected several buildings in such an insecure, defective, and unsanitary manner that they may cause the spread of disease and death, with a nominal fine of 10s. But this is not the fault of the district surveyor. One district surveyor, however, last year did succeed in getting a builder fined accumulative penalties to the amount of £170, and the defendant was sent to prison for six months in default. The same district surveyor has recently, at his own risk, pulled down a large quantity of work erected contrary to the law, and expended some hundreds on making the building safe; and is now suing the freeholder of the building estate to recover the money.

Scarcely a week has passed during the last year but numerous cases where district surveyors have prosecuted scamping builders have been reported in the professional journals, and not one-tenth of these brought into the courts are published. All these proceedings entail heavy losses on district surveyors as prosecutors. Can these measures be called winking at speculative builders' acts?

The writer alludes to Mr. Vulliamy, the architect of the Metropolitan Board, as only a "magnified district surveyor." For the last 18 years Mr. Vulliamy has actively superintended the whole of the architectural and surveying works connected with the grand metropolitan improvements carried on during that time by the Board of Works, and the urbanity, candour, and high sense of honour displayed by him in his dealings with the profession generally has made his name a proverb in the profession, and I submit that it is too late in the day to assert that cases referred from district surveyors to him do not meet with fair treatment at his hands; and as respects the Board of Works, not only are Mr. Vulliamy's recommendations fairly considered, but the Board has often gone out of its way to assist applicants to meet special difficulties by calling in the assistance of their engineer, Sir Joseph Bazalgette, or in cases of fire-proof construction, of Captain Shaw, and frequently they have not even insisted on the strict legal interpretation of the Building Acts.

The latter part of the article, though satirical and amusing, does not affect in the slightest degree the question referred to in the heading; but the statement that district surveyors endeavour to make their districts preserves for private practice is absolutely false, as they are compelled by law to report every case where they are themselves so employed and to get some other surveyor appointed to overlook them.

It is not for me, Sir, to complain of the part the Building News has hitherto taken with respect to bad and speculative building, and rotten and defective houses. In proceedings which I have at various times initiated or assisted at for the purpose of preventing bad building, your paper has often afforded me generous and powerful assistance; and though, perhaps, want of knowledge of the technical working of the Building Acts, and the difficulty of enforcing them, may have led the writer astray, yet it is only by the continued discussion of the question that the plague of bad building can be stayed.

But I fearlessly assert that as regards their capacity, intelligence, integrity, and zeal, the district surveyors of London are fully equal to their work, and that they are doing their duty to the utmost of their power, and that the evils we all deplore in connection with bad building are to be remedied, not by fault-finding or jealousy, but by the Press seconding the efforts of those who are doing their utmost to enforce the law as it at present stands, whilst at the

same time working for its amendment and extension.—I am, &c.,

ROBERT WALKER, F.R.I.B.A.,
District Surveyor of St. Martin's-in-the-Fields, and St. Anne, Soho.

THE FUTURE OF CEMENT.

SIR,—I have been to Auerley with Mr. Drake, and he has shown me a passage tiled with cement-tiles, some of which are red. He informs me it was done in 1870, in which case he would be correct in the assertion he made in your paper.—I am, &c.

W. H. LASCELLES.

121, Bunhill-row, London, E.C.

GLOUCESTER REREDOS.

SIR,—As I know something of the above reredos and its workers, will you allow me to correct the statement of Mr. Hems in your last week's issue? Mr. William Redfearn, of Upper Kennington-lane, London, whose early death Mr. Hems deplored, is *still living*; but he was not the sculptor of the groups and figures in the reredos, but the highly esteemed and talented gentleman, the late Mr. James F. Redfern, then of Queen Anne-street, next door to the house and studio of the great landscape painter Turner.—I am, &c.,

HENRY TERRY, Architectural and Monumental Sculptor.

34, Crawshay-road, North Brixton.

LYVEDON NEW BUILDING.

SIR,—The letters E. T. N. on the wreath surrounding the sacred monogram probably stand for EN-TOYTΩ-NIKA—In hoc (signo) vinces—in allusion to the Labarum or Imperial banner of Constantine.

Leamington, Feb. 6th. C. R. HOMER.

Intercommunication.

QUESTIONS.

[6389.]—**Stained Wood.**—The interior of a chapel, including open-timbered roof and seats, are stained dark oak. The church being rather dark, this makes things more gloomy. Can this be taken off in any way without scraping, and light stain substituted? If not, what tint could be suggested in the way of paint?—A SUBSCRIBER.

[6390.]—**Whatman's Paper.**—Some of this paper (hot pressed) I have had by me about six years, and now when coloured on it becomes very spotted, and the ink runs on it just as it would on blotting-paper. What is the cause of the defect, and is there any remedy for the same? The advice of your readers will be thankfully received by —AN OLD SUBSCRIBER.

[6391.]—**Royal Academy—Measured Drawings of Ancient Buildings, &c.**—Will some of your readers kindly give me information of the above? Is anyone eligible to compete, or must you be studying at the Academy? When must drawings be sent in, and what are the stipulations laid down? Any hints will greatly oblige—A STUDENT.

[6392.]—**Pipe-Jointing.**—Can any correspondent inform me whether the jointing of stoneware drain-pipes in cement and flaunching externally round the socket and joint with clay puddle is a bad system? It has been suggested that the clay puddle prevents the cement from setting, and destroys to a certain extent the chemical action which takes place in the process of setting. Is this so?—ENGINEER'S ASSISTANT.

[6393.]—**Dog-Kennels.**—Can any of your readers tell me the best way to design a kennel for six dogs (beagles), or what books to consult on the subject?—R.

[6394.]—**Entasis of Greek Column.**—Will some one kindly explain how to set out full size the entasis of a Greek column, or give the name of a work in which the information may be found.—VINCTUS URSUS.

REPLIES.

[6381.]—**Refinement and Neatness.**—It would be difficult, without seeing the work, to recommend any treatment for removing colour from old brickwork. If, however, the colour was made up with lime, a weak solution of hydrochloric acid, say 1 part to 8 or 10 of water, would probably remove it. It would have to be applied by rough brushes of some kind, and would probably want more than one repetition. Hydrochloric acid is cheap, about 2d. per lb., and is useful for removing lime from anything which does not itself contain much lime as a basis.—THE WRITER OF THE ARTICLE ON "REFINEMENT AND NEATNESS."

[6382.]—**Gas-Stoves.**—These articles are considered unhealthy.—F.

[6382.]—**Gas-Stoves.**—I have warmed my offices for years with Cundy's patent gas-stove, manufactured by Messrs. Carbitt and Co., of Rotherham. I have used numbers in offices, rooms, halls, shops, &c., and never in one instance heard of anything unpleasant arising from them. Indeed, it is the best stove I have met with. The construction is a terra-cotta cylinder inside an iron one, the space between receiving the products of combustion, which are taken away by a tube to either a flue or the exterior of the building. The air is admitted at the bottom of the terra-cotta cylinder, is checked in its progress upwards, and issues at a perforated top at about 110°. They are made in three sizes, and I prefer the atmospheric burner properly adjusted.—W. P.

[6382.]—**Gas-Stoves.**—I am decidedly of opinion gas-stoves are less healthy than ordinary fire-grates when there is no special means of escape for the products of combustion, and every physician of reputation condemns gas as a deadly foe to health, even when used for lighting purposes. The mischief may be considerably lessened, however, by the provision of proper outlets near or in the ceilings for the escape of the poisonous products of combustion, such as the carbonic acid and other impurities, and by proper inlets for the supply of fresh air to the stove. A ventilating opening above the stove in the ceiling, or leading to a flue, would be the best means, and the ventilating gas-burner of Rutter's should be used in all rooms where much gas is burned.—G. H. G.

[6382.]—**Gas-Stoves.**—These are more dangerous than fires, because the products of combustion, although dangerous, are not seen, like smoke from fires. Special narrow chimneys would, in many cases, require to be put in for these gas-stoves to render them as safe as fires, and even then I fear they would not be as healthy. A good fire both heats and ventilates, while its smoke gives warning of down-draughts and bad chimneys. The case mentioned at page 140 of three gentlemen fainting in a room with a gas-stove is probably only one case of many bad effects from them. Of course, like other things, they are open to improvements, but in the mean time people using them should be careful and watch their real effects.—W. P. B.

[6383.]—**Condensation on Windows.**—Put plenty of outlet ventilation above the glass through the cornice, or by means of shafts internally, up to and through the roof, if practicable.—F.

[6383.]—**Condensation on Windows.**—The only way to clear the condensed moisture is to provide good ventilation, and to preserve a sufficiently high temperature in the shop to prevent condensation taking place. There ought to be openings above the plate-glass windows, so that there may be a constant circulation of the air; but under certain conditions of the atmosphere, as when a sudden fall in the temperature takes place which deposits moisture quickly, little can be done, and I have occasionally seen well-ventilated shops subject to the mistiness.—G. H. G.

[6384.]—**Nett Measurement.**—The "nett" measurement means the dimensions of any material after deducting any surplus. Thus the granite ashlar, without the groove for caissons, would be the "nett" quantity of material.—G.

[6386.]—**Electric Bells.**—The reason "A Subscriber's" electric bells act in the way he describes may be due to two or three causes. In the first place, should the wire not have sufficient resinous insulation the moisture in the atmosphere and walls will so affect the covering that it becomes a conductor rather than an insulator, consequently the current, instead of flowing from the pushes to the instruments, will escape by the wall to earth. Secondly, if the presses are not tipped with platinum the points of contact are apt to become corroded, and so prevent the current flowing into the line. This would account for only one of the two presses in the same room acting. Thirdly, if the instruments are coarsely made the current would not be sufficiently strong, after a little use, to work them. If these points are attended to the bells will be found to act properly.—JULIUS SAX, 108, Great Russell-street, W.C.

[6387.]—**Deposit on Quantities.**—You can sue the architect for the deposit if more lenient measures have been unavailing.—G.

[6387.]—**Deposit on Quantities.**—Sue him.—F.

[6388.]—**Quantities.**—It is usual. As to its being proper is another, and somewhat open, question.—F.

[6388.]—**Quantities.**—It is customary for the architect to receive a part of the fee for quantities if he has been to the trouble of supplying the surveyor with information and explaining his drawings and specifications. The proportion he receives is generally determined by prearrangement. Sometimes it is a fourth. I do not think, however, the practice is a defensible one on the grounds of policy, and the less architects have to do with quantities the better for them.—G. H. G.

[6388.]—**Quantities.**—It is perfectly clear that an architect has not any right whatever to divide or receive part of the fees for quantities. His trouble for negotiating with the surveyor and explaining drawings and specifications, &c., is covered by his commission as architect, is part of his duty, and to require or accept from the surveyor remuneration for it would be very improper. The council of the R.I.B.A. have recently published a statement on this subject, which deserves the careful attention of "An Architect" and others who may desire to find a loophole to justify the appropriation of part of the surveyor's remuneration.—AN OLD SURVEYOR.

[6388.]—**Quantities.**—In reply to "An Architect," I should say that it is certainly not "usual" nor is it "proper" for an architect to divide or receive any part of the fee for quantities because he has been "put to some amount of trouble in negotiating with the surveyor and explaining drawings and specifications," &c. What the *negotiations* may be I do not know, but, certainly, the necesary information of telling a surveyor what the drawings and specification mean would come within the services for which the architect receives his commission. Of course, the better the drawings and specification, and therefore the better the architect, the less necessity for the *negotiations* and explanations. It might be well to quote the following manifesto, which was printed in the *Proceedings*, 1880-81, No. 5, of the R.I.B.A., and which it would be well for members of the Institute to bear in mind, and in addition to which I would recommend members to turn to By-law XXIII. The manifesto is as follows.—"Sharing Commissions with Quantity Surveyors.—It having been recently stated to the Council of the Royal Institute of British Architects that the charges made by quantity surveyors are sometimes shared by the architect, and such a practice, if it really exist, being open to great and obvious objection, the Council hereby publicly declare that for the future such practice, if proved, will be deemed conduct which, in the opinion of the Council, is derogatory to the professional character of any Fellow or any Associate of the Institute."—

A new church is about to be erected in Harder's-road, Peckam, S.E.; from the designs of Mr. C. L. Luck.

WATER SUPPLY AND SANITARY MATTERS.

ABERYSTWITH WATER SUPPLY.—A special meeting of the Town-council of Aberystwith was held last week for the purpose of deciding what steps should be taken with reference to the completion of the new reservoir; the affairs of the contractor, Mr. Thomas James, being now in liquidation. Two applications were received. The contractor's sureties asked either to be released from their obligation or to be allowed to finish the work; the trustees of the contractor's estate also offered to do the work and to pay the creditors 20s. in the £, provided a guarantee were given them by the town-council. It was resolved that as the original sureties must still be held responsible, they should be allowed to finish the work if they thought fit. They were further empowered to treat, if they chose, with the trustees, for the due performance of the contract.

Our Office Table.

WE regret to announce the sudden death of Mr. William Hoff Wontner, architect, which occurred on Wednesday, the 2nd inst., at the age of 57. The deceased had for some months complained of failing health, but was attending to his professional duties up to the time of his death, which took place at his residence after returning from business for the day. Mr. Wontner, who 30 years ago gained a medal for a design shown at the International Exhibition in Hyde Park, enjoyed good connections and a considerable private practice, but he will be better known as being for nearly 30 years associated with Messrs. Holland and Sons, during which time he carried out many large works for them, having the entire charge of designing and arranging the decorations and furniture executed by this firm. Amongst the houses referred to may be mentioned Balmoral, Floors Castle, Sandringham, Cloverley Hall, Costessy Hall, Sefton House, and Croxteth. In such extensive works as these, Mr. Wontner had many opportunities of displaying his taste and ability, especially in the alterations of a constructional character, which in several instances had to be made. In all these the deceased brought his skill as a practical architect to bear with results which always gave much satisfaction to those who employed him. The life of one who thus quietly did his work thoroughly and well deserves a record, though the importance of the above-named instances of his designs will cause his memory to remain.

THE Paris art-world is just now busy, and amateurs are looking forward to the yearly Salon. Several exhibitions which may be considered as forerunners of the great annual show opened this week. Only two of them, however, are worth especial notice, that at the Mirlitons Club in the Place Vendôme, and the one at the Cercle Artistique et Littéraire, in the Rue Volney. At the Place Vendôme the first thing that is sought after is invariably what Meissonier may have contributed. This year it is the portrait of a gentleman, evidently, from the surroundings, a sculptor. The artist has depicted his model in the most natural of positions, sitting on the arm of a large straight-backed chair. He is a man in the prime of life, and holds in the left hand a half-consumed cigar. Another great attraction is the portrait of the Prince of Wales by Bastien Lepage. The likeness is not perfect, but the picture is truthful in every detail.

THE Northern District Meeting of the Association of Municipal and Sanitary Engineers and Surveyors will be held at Blaydon-on-Tyne, on Friday, the 25th inst. The members will assemble at 12 o'clock in the large room, Station Hotel, Blaydon. Those who purpose attending the meeting are desired to indicate the same by post-card addressed to Mr. P. W. Thomson, district honorary secretary, Willington Quay, Northumberland. The following papers will be read and discussed:—"Roadways," &c., by James Hall, borough surveyor, Stockton; "Wood Pavements," by R. S. Rounthwaite, borough surveyor, Sunderland. During the day the works of Messrs. Smith, Patterson and Co., sanitary ironfounders, Messrs. Douglas Bros.' ironworks, Messrs. Harriman and Co.'s pipe-works, and Blaydon bottleworks will be visited.

THE *Dublin Express* states that the restored cathedral of St. Patrick, in Dublin, "which

stands as a monument to the pious munificence of Sir Benjamin Guinness and which he bequeathed as a precious inheritance to the Church of Ireland," is already crumbling to decay. The fact is disgraceful, but it can no longer be concealed, for the most cursory observer need only look around to see the damp floors, the pillars mouldering at the bases, and the wormeaten woodwork of the pews, all bearing evidence to the progress already made in the work of destruction. The injury now proceeding is alleged to be due to defective drainage; the cathedral is built on a low site near the bed of the river Poddle, and there is a well, known as that of St. Patrick, situate in the middle of the aisle, which frequently overflows. The *Express* condemns alike the dean and chapter, the cathedral board, and the congregation who worship at St. Patrick's, and says it will be a disgrace to the whole Protestant Church of Ireland if measures be not immediately instituted for thoroughly overhauling the condition of the fabric, and investigating, with a view to remedying, the causes which have led to the mouldering and crumbling condition of the foundations.

THE annual distribution of prizes to the students of the Artisans' Institute took place on the 31st ult. at the Institute premises in Castle-street, Upper St. Martin's-lane, when a number of addresses were delivered having reference to technical and trade instruction. Sir Philip Cunliffe-Owen, K.C.M.G., C.B., presided, and referred to the steady improvement on the art side of English manufactures which had been progressing during the last few years, mentioning, as an illustration of the new position taken up, that a French manufacturer of furniture had recently visited London to purchase English goods. He trusted that when this Institute was transferred to Finsbury, and obtained the advantages to be offered by the City guilds, the members would benefit by the new opportunities offered. Amongst other speakers were Messrs. Hodgson Pratt, treasurer, and a trustee of the Institute; Philip Magnus, secretary of the City and Guilds of London Institute; H. Trueman Wood, secretary of the Society of Arts; E. C. Robins, and Professor Huntingdon, of King's College; the general tone of the meeting being congratulatory upon the prospect of the establishment of a united guilds' college in Finsbury.

WE were the first, a good many years ago, to suggest the advisability of the establishment in the metropolis of a permanent exhibition of the various materials and appliances used in building construction. The experiment was tried more than once with varying degrees of success, but never, as it seemed to us, on a sufficiently extended scale, or with the requisite attention to the necessary conditions to ensure permanent and complete prosperity. It is absolutely necessary, for the thorough development of the idea, that the founders of such an establishment should be completely disinterested and possessed of sufficient capital and energy to thoroughly comprehend the various branches of the industries they seek to illustrate. These requirements, as far as we are able to judge, will be found in connection with the Builders' and Manufacturers' Exchange and Subscription Rooms, recently opened at 205-6, High Holborn. The promoters have secured central and spacious premises, and they have gathered together a very interesting and valuable collection of materials and appliances which will doubtless be added to from time to time. Not only this, but they have in the application of many of the more important inventions connected with heating, lighting, drainage, and ventilating, adopted the best means of exhibiting the different appliances in connection therewith by applying them to the needs of the building itself, so that the architect and builder can see different systems in action almost side by side, and thus judge for himself of their merits. The venture should obtain the combined support of architects, builders, and manufacturers, and while it is characterised by the business tact and fairness which seem to have attended its establishment will doubtless do so.

HOUSEHOLDERS are sometimes summoned for not cleansing the footpaths in front of their premises; but it is turning the tables in quite an opposite direction to find a surveyor of highways charged with neglecting his duty in not removing the snow from the public roads. A case of this kind came before the magistrates at Brigg, on Tuesday. Evidence was given that for a week two sides of a road were blocked with snow varying from five to six feet in depth, that during this time the defendant employed only three old men to remove it, and that after the receipt of a justice's order five days elapsed before the road was cleared for traffic. A fine was imposed.

THE Students' Preliminary Examination of the Institution of Surveyors was held on the 25th and 26th ult. The passing of this examination is the condition of enrolment in the class of students. The subjects comprised simple mathematics, the first three books of Euclid, history, one language (ancient or modern), and the writing of an original essay. Of the eleven candidates who entered, the following, whose names are given alphabetically, satisfied the examiners, viz.—J. Crawter, A. P. Durlacher, A. Paull, R. C. Squarey, W. Tarrant, and C. E. Waring. W. Tarrant passed at the head of the list, obtaining nearly full marks in each subject. These candidates will be expected to present themselves for the final (technical) examination in April, 1883, at the close of their student course.

Epps's Cocoa.—Grateful and Comforting.—"By a thorough knowledge of the natural laws which govern the operations of digestion and nutrition, and by a careful application of the fine properties of well-selected Cocoa, Mr. Epps has provided our breakfast tables with a delicately-flavoured beverage which may save us many doctors' bills. It is by the judicious use of such articles of diet that a constitution may be gradually built up until strong enough to resist every tendency to disease. Hundreds of subtle maladies are floating around us ready to attack wherever there is a weak point. We may escape many a fatal shaft by keeping ourselves well fortified with pure blood and a properly nourished frame."—*Civil Service Gazette.*—Sold only in Packets labelled—"JAMES EPPS and Co., Homœopathic Chemists, London."—Also makers of Epps's Chocolate Essence for afternoons.

CHIPS.

At a meeting held at Keighley, Yorks, last week, it was decided to erect a church in the thickly-populated district of Lawkholme, at a cost of about £2,600, and Mr. J. Bailey, of Keighley, was appointed architect.

Tenders were last week accepted for the erection of a new infirmary at Dewsbury, and amounted in all to a total of £10,864 13s. 4d.

The Llantrissant school board decided on Friday to erect new schools for 400 children at Gwawn-yr-Ergyd, near Williamstown, from the designs of Mr. Jenkin Evans, of Treorky.

The gas company of York have let the contract for a new gas-holder to Messrs. Close and Ayre, of York.

Major V. H. Vaughan-Lee, M.P., will bear the cost of restoring the chancel of the parish-church of Ilminster, one of the finest Perpendicular buildings in the West of England, and the work has just been commence by Mr. C. Trask, builder, of Norton-sub-Hamdon.

The local board of health for Croydon resolved last week to expend £5,535 on new farm buildings and manager's house at the sewage farm, at Beddington.

A new peal of bells were dedicated yesterday (Thursday) afternoon at Christ Church, Bray, near Dublin. The bells number eight, the heaviest weighing nearly 29 cwt., and measuring 54in. in diameter across the mouth. They were cast by Messrs. Taylor, of Loughborough, and have cost, with frame, about £1,000.

A parish meeting was held at Lewes on Wednesday week, to consider the question of improving and enlarging the parish-church of All Saints, a building re-erected in 1805, and having all the incongruities and defects of that period. It was decided to rebuild the church in sections, as funds permit, on an enlarged scale; and a committee was appointed to make inquiries and obtain plans.

The town council of Salisbury accepted, on Thursday week, an offer made by the Ven. Archdeacon Sanctuary, to purchase, at £750, their moiety of the interesting building known as the Old City Workhouse, and formerly as Audley House, the archdeacon stating that it was his desire to conserve the leading architectural features of the building, and to make it, in a renewed condition, a credit to the city.

The workmen in the employ of Mr. Crossley, builder, of Bromley, Kent, met at the "Duke's Head," in that town, on Saturday week, and presented a box of mathematical instruments, as a testimonial, to Mr. Simmons, who has been manager to Mr. Crossley for six years.

The 26th annual report of the Wesleyan Chapel Committee states that during 1880, 116 new chapels, costing £137,156, were opened; 15 schoolrooms, 10 ministers' houses, and other enlargements and additions, with 35 new organs, involving an entire cost of £312,548, which is less by £72,857 than the outlay of 1879, while the new chapels show a decrease of 13, both these declines being attributable to commercial depression. There are now 101 chapels in course of erection at a cost of £139,604, and about two-thirds of these are being erected in districts where there were previously no Wesleyan Methodist chapels.

Mr. H. Breston Wallen, son of Mr. William Wallen, architect, Greenwich, has been appointed secretary to the Home for Working Boys, London.

The Warnford Ecclesiastical Trustees, at their recent annual meeting, made the following grants towards the erection, enlargement, or restoration of churches situate within the ancient diocese of Gloucester:—Chalford, £15; Clifford's Mesne, £150; St. James's, Gloucester (additional) £50; Hartferry, £200; Gloucester, Raikes' Memorial, Brunswick-road, £500; Todenham (additional), £30; and Whiteshill, £200. For parsonages: All Saints, Gloucester (additional), £25; Churcham, £75; Eastleach Martin, £100; Kempsford, £100; Nympsfield, £10; Sheepscombe, £20; Taynton, £701; Womington (additional), £100; and Welford, £12.

St. Cuthbert's Church, Pandon, Newcastle-on-Tyne, has just been opened, and is built from the designs of Mr. Gibson, architect, Newcastle-on-Tyne. The interior fittings, including a handsome brass gasalier, oak litany-desk, &c., are the work of Messrs. Jones and Willis, of Birmingham.

Lamplough's Pyretic Saline is refreshing, most agreeable, and the preventive of FEVERS, BILIOUSNESS, SMALL POX, SKIN DISEASES, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill *Use no substitute* —[ADVT.]

Holloway's Ointment and Pills are remedies designedly placed within the reach of all sickly persons, because the treatment is easily applied, certain in its effects, and perfectly innocuous to the most delicate constitution. For all chest complaints, this Ointment rubbed briskly over the ribs night and morning gives ease, and prevents bronchitis, asthma, &c.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—London Institution. "Fruits and Seeds." By Sir J. Lubbock, M.P., F.R.S. 5 p.m.
Royal Academy. Lectures on Architecture by Professor Street, R.A. No. I. "The Study and Practice of the Art." 8 p.m.
Royal Institute of British Architects. Discussion on "Sanitary Science as Applied to Civil Architecture." 8 p.m.

TUESDAY.—Institution of Civil Engineers. Discussion on "Portsmouth Dockyard Extension Works." 8 p.m.

WEDNESDAY.—British Archæological Association. "Prehistoric Interment at Plymouth." By F. Brent; "Roman Wall of London in Houndsditch." By C. Watkins; and "Notes on New Grange." By J. Romilly Allen, F.S.A. Scot. 8 p.m.
Society of Arts. "Participation of Labour in the Profits of Enterprise." By Sedley Taylor, M.A. 8 p.m.

THURSDAY.—London Institution. "Violins." By Rev. H. R. Haweis. 7 p.m.
Civil and Mechanical Engineer's Society. "The Water-Bearing Strata of the Thames Basin." By A. F. E. Grant. 7 p.m.
St. Paul's Ecclesiological Society. "St. Peter's and St. Paul's Compared." By Somers Clarke, junr., F.S.A.; and "Suggestions for the Fabric of the Church in the Present Day." By E. B. Ferrey. 7.30 p.m.
Royal Academy. Lectures on Architecture by Professor Street, R.A. No. II. "The Principles of the Art." 8 p.m.

FRIDAY.—Institution of Civil Engineers. "The Roade to Northampton Railway." By J. F. Waller, Stud.Inst.C.E. 7 p.m.
Architectural Association. "In Lombardy with the Architectural Association." By E. J. Tarver. 7.30 p.m.
Royal Institution. "Fruits and Seeds." By Sir J. Lubbock, M.P., F.R.S. 9 p.m.

SATURDAY.—Parkes Museum of Hygiene. "Water-Closets, Sinks, and Drains." By Prof. W. H. Corfield, M.A., M.D. 8 p.m.

Doulting Freestone and Ham Hill Stone of best quality. Prices, delivered at any part of the United Kingdom, given on application to
CHARLES TRASK,
Norton-sub-Hamdon, Ilminster, Somerset.
—[ADVT.]

McLACHLAN & SONS, 35, St. James's-street, S.W. Builders, Decorators, and House Painters.
Designs and Estimates.
General Repairs and Alterations Executed.
Experienced Workmen always in readiness, and sent to any part of the country.—[ADVT.]

BATH STONE.
SUMMER DRIED,
CORSHAM DOWN,
100,000 Feet Cube.
PICTOR & SONS, BOX, WILTS.
[ADVT.]

TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender—it adds to the value of the information.

BARKING.—For the excution of road and sewer works at Barking, for the United Land Company, Limited:—

Porter	£3,650	0	0
McKenzie and Co.	2,792	0	0
Jackson, J.	2,777	0	0
Pizzey	2,774	0	0
Iles	2,763	0	0
Harris	2,740	0	0
Dyer	2,644	0	0
Holloway	2,573	10	0
Jackson, John	2,530	0	0
Catley	2,500	0	0
Jackson, Joseph	2,492	7	6
Ford and Co.	2,395	0	0
Acock (accepted)	2,348	0	0
Tenders received too late—			
Wilkes and Co.	3,769	0	0
Coker	3,004	0	0

BATTERSEA, S.W.—For the erection of a school for 1,200 children in Raywood-street, Battersea Park-road, for the London School Board:—

Downs, W., Walworth (accepted) £9,428 0 0

[On Dec. 16th last, the Board accepted Mr. Downs' tender at £7,133 for the erection of a school for 800 children on same site. It having been decided to increase the accommodation by 50 per cent., a new tender was obtained based on a schedule of prices. Cost of site so far as purchased (area 28,772 square feet), £7,642 17s. 7d. Cost of (*a*) school buildings only, including closets, £8,022; (*b*) tar pavement and playground, £341; (*c*) boundary walls and gates, £282; (*d*) teachers' rooms, £300; (*e*) schoolkeeper's house, £350; special expenditure chargeable to site: (*f*) extra depth of foundations, £133; total, £9,428. Cost per head of (*a*), (*b*), and (*c*), £7 14s. 1d.; total cost per head, £8 7s. 1.]

BRISTOL.—For alterations to No. 3, Spring Villas, Egerton-road, Bishopston, Bristol, for Mr. H. W. Tiver. Mr. W. Morgan Robbins, architect, Ilfracombe:—

Tucker, G., Horfield	£449	2	0
Crocker, R. J., Bedminster	398	0	0
Bastow, J., Clifton	390	0	0
Perrott, J., Stapleton-road	374	0	0
Dowling, W., Bishopston	348	10	0
Sharp and Graham, Bristol	341	0	0
Wakley, J., Bristol	338	0	0
Winnett, G., Bristol	337	8	0
Griffiths, E., Bedminster	330	0	0
Pearce, J., Totterdown	326	0	0
Hill, A. G., Bishopston	325	15	0
Weaver and Mizer, Bishopston	325	0	0
Heard, J., Bishopston	324	10	0
Passco, J., Bristol	321	0	0
Banner, W. and Co., Bristol	318	0	0
Tucker, J., Clifton	306	0	0
Lawe, J., Totterdown	305	0	0
Ind, R. J., Bristol	296	10	0
Slade, W., St. Michael	290	0	0
Hodges, E. M., Bristol (accepted)	265	0	0
James, J., Stapleton-road	242	0	0

CHISELHURST.—For the erection of stabling at Chiselhurst, for Mr. R. F. Parks. Mr. Charles Bell, architect:—

Toms (accepted) £500 0 0

DEPTFORD, S.E.—For paving approaches to the new Deptford Bridge, for the Metropolitan Board of Works: Mowlem, J. and Co. (accepted).

FULHAM, S.W.—For paving works in Seagrave-road, for the Fulham district board of works. Mr. A. C. Bean, surveyor:—

Alldred (accepted) £310 0 0

[Lowest of eight tenders, of which the highest was £411.]

GREAT YARMOUTH.—For the erection of a tavern, for Mr. D. S. Bayfield. Messrs. Bottle and Olley, architects. Quantities supplied:—

Howes, T.	£3,025	0	0
Beech and Cork	2,795	0	0
Howes, E.	2,780	0	0
Leggett, J. (accepted)	2,751	0	0

GREAT GRIMSBY.—For the erection of Wesleyan Methodist Chapel, South Parade, Great Grimsby. Mr. Charles Bell, of London, architect:—

Benton	£2,889	0	0
Willows and Roebuck	2,880	0	0
Saunders	2,879	0	0
Doughty	2,794	0	0
Guy	2,680	0	0
Loughton	2,605	0	0
Burnett	2,556	0	0
Purkiss	2,500	0	0
Chapman	2,416	0	0
Topham	2,315	0	0
Riggall and Hewins (accepted)	2,303	0	0

(Architect's estimate, £2,500.)

HALIFAX.—For the supply of cast-iron pipes to the waterworks committee of the town council:—

Cochrane, Grove, and Co., Middlesbrough (accepted).

KIDDERMINSTER.—For corporation sewage farm. Mr. E. Pritchard, engineer, 27, Great George-street, Westminster, S.W., and 37, Waterloo-street, Birmingham. Quantities by Mr. E. J. Purnell, Coventry:—

				Alternative tender.		
Kellett and Bentley, Ealing	£6,500	0	0	£5,969	0	0
Davison, W., Sheldon	5,797	0	0	5,303	0	0
Hughes, H., Lr. Gornal	5,550	11	3	5,243	2	5
Currall & Lewis, B'mingham	5,235	0	0	4,560	0	0
Mackay, F., Swansea	4,710	0	0	4,227	0	0
Kirk, T., Chester	4,320	0	0	3,990	0	0
Burkett and Co., B'mingham	4,198	0	0	3,997	0	0
Vale, T., Kidderminster	3,680	0	0	3,100	0	0
Smith, T. M., London	3,078	0	0	3,012	0	0
Law, G., Kidderminster*	2,800	0	0	2,550	0	0

* Accepted.

ILFRACOMBE.—For new front and repairs to "Royal Clarence Hotel," Ilfracombe. Mr. W. Morgan Robbins, architect:—

Rowe, Ilfracombe	£975	0	0
Durke, Ilfracombe (accepted)	875	0	0

For joinery work to above:—

Wibby, Gloster (accepted)	£155	0	0

ILFRACOMBE.—For plumber's work to roof of swimming-bath, for the Ilfracombe Hotel Co. (Limited). Mr. W. M. Robbins, architect:—

King, J., Ilfracombe	£127	0	0
Avery, J., Ilfracombe (accepted)	117	0	0

LEWISHAM.—For the erection of a school at the Wesleyan Church, Lewisham. Mr. Charles Bell, F.R.I.B.A., architect:—

Tarrant	£975	0	0
Hughes	910	0	0
Magor	922	0	0
Kennard (accepted)	844	0	0

LEWISHAM.—For pulling down and rebuilding the Hope public-house, and two adjoining dwelling-houses and shops. Mr. T. Searancke Archer, A.R.I.B.A., architect:—

Syme and Duncan	£4,306	0	0
Freight	3,883	10	0
Jerrard	3,793	0	0
Priestly	3,469	0	0
Macey	3,343	0	0
Crisp and Tomlin	2,763	0	0
Beale (error, withdrawn)	2,330	0	0

LEYLAND.—For house and shop, Leyland, Preston. Mr. David Grant, architect:—

Brickwork: Matthews, J.
Masonry: Banister, C.
Joiner; Potter, M.
Slating, &c.: Bowling, J.
Plumbing: Crocker, T.
Plastering: Hunt, J.
Revolving shutters:—
Salmon, Barnes, and Co.

LONDON.—For erection of warehouse, Edmund's-place. Mr. George Vickery, architect:—

Greenwood	£4,743	0	0
Ashby, Bros.	4,483	0	0
Brass	4,473	0	0
Nightingale	4,470	0	0
Conder, E.	4,380	0	0
Crabb	4,209	0	0
Lawrance	4,156	0	0

LONDON.—For reparation, &c., to Nos. 11 and 13, Glasshouse-street, Westminster, for H. B. Bell, Esq. Mr. J. Lansdell, surveyor:—

Nuttall	£199	0	0
Brede, W.	196	0	0
Bamford, W.	195	0	0
Durrant, W. H.	193	0	0
Adams	165	0	0

LONDON, N.—For the enlargement of the Bowman's-place school, Seven Sisters-road, by 400 places, for the London School Board. Mr. E. R. Robson, F.S.A., architect to the Board:—

Brass, W.	£3,586	0	0
Williams, G. S. S. and Son	3,425	0	0
Pritchard, G. S.	3,390	0	0
Lawrance, E.	3,357	0	0
Roberts, L. H. and R.	3,323	0	0
Stimpson and Co.	3,260	0	0
Grover, J.	3,144	0	0
Boyce, T., Eagle Works, Hackney*	3,123	0	0

* Accepted.

[Cost of site (area 23,714 square feet), £10,579 7s. 3d.; cost of (*a*) school buildings, including closets, £2,932; (*b*) tar pavement and playground, £40; (*c*) boundary walls and gates, £51; (*d*) teachers' rooms, £100; total, £3,123. Cost per head of (*a*), (*b*), and (*c*), £7 11s. 1d.; total cost per head, £7 16s. 1d.]

LONDON.—For Guilds' City Technical College, Tabernacle-row:—

Bangs, W. and Co.	£24,643	0	0
Higgs and Hill	23,745	0	0
Smith, G. and Co.	23,470	0	0
Macey and Sons	23,220	0	0
Manley, M.	22,977	0	0
Clarke and Bracey	22,773	0	0
Ashby and Horner	22,700	0	0
Holland and Hannen	22,547	0	0
Ansell, C.	22,422	0	0
Adamson and Sons	22,392	0	0
Shaw, G.	22,230	0	0
Grover, J.	21,734	0	0
Conder, E.	21,679	0	0
Nightingale, B. E.	21,581	0	0
Perry and Co.	21,438	0	0
Lawrance, E.	21,265	0	0
Brass, W.	20,873	0	0
Peto, Bros.	20,382	0	0

MAITLAND PARK.—For the erection of chapel and hall, at the Orphan's Working School, Maitland Park, Haverstock-hill, the gift of Sir James Tyler. Mr. Charles Bell, F.R.I.B.A., architect, Dashwood House, New Bond-street. Quantities by Mr. Henry Lovegrove, 26, Budge-row, E.C.:—

Patman and Fotheringham	£4,775	0	0
Outhwaite and Son	3,285	0	0
Coles	3,100	0	0
Tarrant and Son	3,057	0	0
White, R.	2,987	0	0
Woodward	2,850	0	0
Green	2,800	0	0
Boden	2,787	0	0
Holliday	2,078	0	0

For the erection of master's house, at the Orphan's Working School, Maitland Park. Mr. Charles Bell, architect. Quantities by Mr. H. Lovegrove:—

Coles	£1,116	0	0
Patman and Co.	1,100	0	0
White	1,098	0	0
Tarrant	1,082	0	0
Oathwaite	1,000	0	0
Green	998	0	0
Bowden	995	0	0
Holliday	975	0	0

MILE END.—For rebuilding Nos. 220 and 222, Mile End-road, for D. Salmon, Esq. Mr. Ellis Marsland, architect:—

Marsland, J., Walworth (accepted) £980 0 0

NEWPORT, MON.—For removal of mud, forming mooring place for pilots, and erecting house at Pilots Pill, for the Newport harbour commissioners. Mr. E. A. Lansdowne, architect, Newport, Mon.:—

Firbank, Newport	£519	13	9
Jones, W. and Son, Newport	464	0	0
Thomas, J., Newport	441	0	0
Linton, J., Newport	421	0	0

(Architect's estimate, £428 10s. 3d.)

NEWPORT, MON.—For offices, No. 2 weigh-bridge, and foundations to same in ballast sand, for Newport harbour commissioners. Mr. E. A. Lansdowne, architect, Newport, Mon.:—

Offices and foundations:—

Moulson and Brownscombe, Newport	£74	0	0
Firbank, Newport	70	0	0
Linton, Newport	70	0	0
Francis, J., Newport	62	0	0
Jones, W. and Son, Newport	47	18	0

For No. 2 weigh-bridge:—

Pooley and Son	£142	0	0

NORTH BOW, E.—For improvements to lighting and additional cloak and closet accommodation at the school in Wright's-road, North Bow, for the London School Board:—

Hook and Oldrey	£446	0	0
Cox, C.	390	0	0
Wood, F. and F. J.	389	0	0
Atherton and Latta, Chrisp-street, Poplar (accepted)	342	0	0

READING.—For new library, museum, students' rooms, nurses' and servants' apartments, laundry, colonnade, and covered ways to connect with the main building at the Royal Berkshire Hospital. Messrs. Morris and Stallwood, architects, Reading:—

Rider, T. and Son	£10,081	0	0
Brass, W.	10,060	0	0
Woodroffe, W. H. and Son	10,030	0	0
Silver, R. and Sons	9,945	0	0
Filewood, C.	9,797	0	0
Claridge, C.	9,755	0	0
Lovatt, H.	9,731	0	0
Shaw, G.	9,721	0	0
Sheppard, A.	9,619	0	0
Searle, G.	9,569	10	0
Clarke and Bracey	9,544	0	0
Kimberley, A.	9,495	0	0
Braid and Co.	9,470	0	0
Chappell, J. T.	9,255	0	0
Clements, C.	9,180	10	4
Simonds, W. H.	8,891	0	0
Parnell and Son	8,719	0	0

For finishing and fitting up the new library, museum, and students' rooms (contract G):—

Clarke and Bracey	£1,988	0	0
Clements, C.	1,931	13	6
Searle, G.	1,895	10	0
Silver, R. and Sons	1,746	0	0
Sheppard, A.	1,700	0	0
Filewood, C.	1,673	0	0
Parnell and Son	1,612	0	0
Braid and Co.	1,600	0	0
Simonds, W. H.	1,546	0	0
Shaw, G.	1,539	0	0
Lovatt, H.	1,338	0	0
Woodroffe, W. H. and Son	1,300	0	0
Claridge, C.	1,200	0	0
Kimberley, A.	1,150	0	0

STOKE-UPON-TRENT.—For additions and alterations to the poor law offices, for the guardians of the poor. Mr. W. A. Keates, architect, Hanley, Staff.:—

Rutty and Warner, Stoke	£393	0	0
Minks, T., Henton	365	0	0
Ellis, G., Hanley	341	10	0
Redfern, H., Hanley	328	0	0
Bradbury, R., Stoke	325	7	0
Ward, A., Hanley	320	0	0
Yoxall, Bros., Stoke (accepted)	265	0	0
Hancock, Stoke	262	0	0
Meadon and Sons, Newcastle	260	0	0
Clarke, J., Hanley	258	0	0

For painting, &c., at above:—

Sprosson, Stoke	£220	10	0
Cochrane, Stafford	172	0	0
Bradbury, Stoke	165	0	0
Pemberton, Stoke	160	0	0
Spencer, Bradford	140	0	0
Peake, Bros., Stoke	130	0	0
Gee, Stoke	125	0	0
Macarthy, London	112	0	0
Morton, Stoke (accepted)	108	0	0

WESTMINSTER.—For alterations and repairs to the bar, "Thistle and Crown," St. Martin's-lane, for Mr. J. Selman. Mr. S. Sanders, architect:—

Smith	£130	0	0
Jackson and Todd	115	0	0
Haskins (accepted)	114	0	0
List	110	0	0

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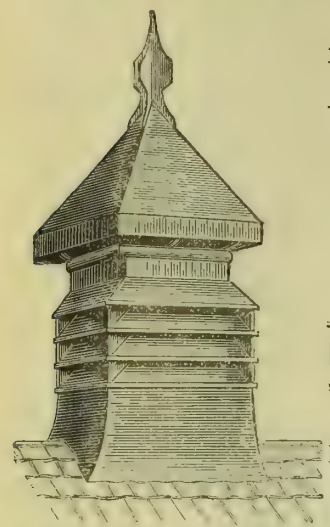

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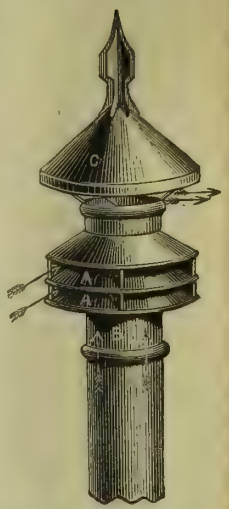

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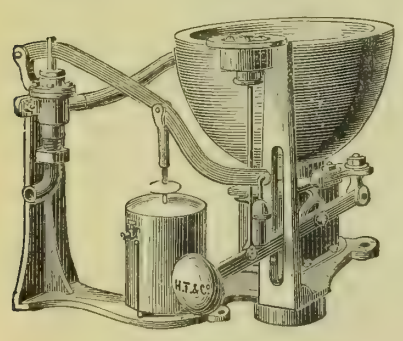

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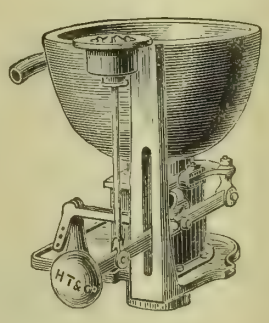

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THE BUILDING NEWS.

LONDON, FRIDAY, FEBRUARY 18, 1881.

ARCHITECTS AND THEIR LECTURERS.

ARCHITECTS have been a good deal lectured lately. They have had a host of sanitary sermons preached to them, both within their own societies and out of them; but we are inclined to doubt whether sanitary science has benefited much by the persistent advocacy of those who come forward as its champions. Not that we desire in the least to disparage the intentions of those who have been attempting to enlighten the profession upon so important a subject—an admitted weak point with one class of architects; but to point out that the pill may be administered in rather too undisguised a form, or rather those who supply the sanitary medicine do so in a way calculated to offend the susceptibilities of many who look upon sanitation as but one, and not the all-important, duty of the architect. It is unfortunate that many of the persistent sticklers for sanitary perfectibility look upon well-constructed drains and traps as the be-all and end-all of good architecture, and that they are, or affect to be, blind, or callously indifferent to the other qualities of domestic arrangement and comfort which the architect is equally called upon to consider and take under his care. It is not rarely we find the sanitary engineer making distinct charges against the architect, and setting himself up in almost everything as the supreme arbiter in sanitary matters, without reflecting that his own hypotheses are often based upon the most recent experience, and are not less seldom at variance with the views of his professional brethren. The questions of drainage, disconnection of pipes, and ventilation, furnish abundant proof of divergence of opinion, and our reports of the recent discussions at the Institute indicate in a remarkable manner how difficult it is for sanitary experts to come to anything like a fair agreement upon matters of sanitary arrangement. Complicated contrivances have, we believe, driven many inexperienced architects mad; they have become bewildered with the claims of traps, ventilating arrangements, closet apparatus, and so forth; patentees have pressed their inventions with such eagerness that the professional man finds it almost impossible to steer clear of conventional complexities, and to rely upon his own sense in meeting any particular case, and in the simplest and least costly way.

It is the attempt to hedge round each new system with a kind of cleverness and complexity, to make every patent a monopoly, and to drive builders and architects to the use of some particular nostrum which, we think, needs guarding against; but the only way of doing so is for architects to acquaint themselves, as one speaker at the Association pointed out, with the general principles of disconnection and ventilation. Let us take, for example, an ordinary house. Instead of applying A. or B.'s patent ventilating trap, the same thing may be accomplished by allowing the drain from the house to the sewer to pass through an open gulley, covered by a grating, and the house soil-pipe may be carried up and left open at the top. Of course, before the house-drain entered the sewer, a siphon-trap should be placed as another check; but the open grating affords all the relief desired, and gives a free escape to any gas that may happen to pass the trap. As regards cowls, their employment is not absolutely necessary, the only requirement being that a current of air can pass uninterruptedly through the house-drain from one outlet to the other. Nothing is easier than thus cutting off the foe, while a patented apparatus, if it gives us an equally efficient result, may be costly to keep in working order. In respect of water contamination, a perfect waste-preventer would disconnect the closet from the cistern, though a separate cistern is the simplest way out of the difficulty.

Then there are a host of crotchet-mongers and hygienic reformers who are always harping upon some favourite notion, such as making all our town dwellings single-story, and converting the roofs of our houses into artificial gardens or schools. Touching the latter, we are told upper London might soon be turned into garden-schools for teaching children on the "kindergarten" system. "Wherever," remarks Dr. Richardson, "the photographer can place a studio for catching the rays of the sun, the teacher can place a garden for his school"; but probably it never occurred to the worthy doctor that of all unsightly abominations, a glass photographic studio on a house gives the greatest pain to the sensitive architect's eye. Nor has, probably, the effect of a pile of snow, several feet deep, on our house-tops been seriously considered in advising flat roofs upon our houses and schools. It is true there would be less risk of sudden avalanches of snow falling upon people in the streets, while the house below would better retain its heat by the check of radiation upwards; but we shudder to think of a thaw upon a flat surface. It has been proposed, with a greater show of reason, to turn the roofs of some of our Board-schools into playgrounds for the children, and the suggestion made by one writer is even more daringly provocative of the art-architect's sense of anguish, namely that it would be necessary to enclose the flat surface with a breast-high wire fence. What our architecture would become if our buildings were at the mercy of these would-be reformers of sanitary matters, it would be hard to predict. We should have our eaves bristling with all conceivable forms of cowls and gas-escapes, our flat roofs would be alternately the scenes of flowering shrubs, romping juveniles, or wet clothes, and the artistic hopes of many in picturesque skylines would be ruthlessly dashed to the ground. Every part of a building would be subject to the innovations of those who had new schemes of construction and ventilation; new ideas of the economical expenditure of our town areas, and sanitary crotchets would on one system make our houses lofty towers of stories, or restrict them to the limit of primitive hovels. By so long standing aloof from sanitary science, architects have brought upon themselves much of the ridicule they now receive. It is in vain they utter protests against the unfair accusations cast upon them by sanitary experts and writers in the public press; all their protestations will be vainly made till they have themselves mastered the subject, and can reply with some earnestness and show by works the faith that is in them.

An architect—a young practitioner especially—is hardly so free an agent as he ought to be when it is his fortune to obtain the erection of a large building. At the very inception of his design he is overwhelmed by a consideration of details upon which much of the success of his work depends; there is not only drainage to provide for, but the most efficient means of accomplishing it; then arise the questions of warming and ventilation, and these must be settled in his own mind before he can complacently sit down to write his specification. In this document no uncertain or floating ideas can find expression, he must resolutely fix upon some one system or another, and specify it. But he is hampered by a host of conflicting schemes and rival claims, and at last, to save thought and trouble, commits himself to some particular apparatus or patent appliance which can be specified in a few words without the trouble of making a number of inquiries about its efficiency or of adopting a simple scheme which might be far better, and at less cost meet the demands of the case. The thing is so easily done—"Provide and fix one of Mr. Nostrum's patent apparatus, &c," the name and address of the patentee is sufficient, and a load of responsibility and mechanical detail is removed from the architect's shoulders at this stroke of the pen. Whether the said apparatus ever answers is a question the architect who adopts this policy seldom cares to find out, and Mr. Nostrum is well satisfied if he gets another architect's testimonial to add to his lengthy list. The profession becomes little wiser by this mode of picking up sanitary knowledge; its members seldom take any trouble to inquire whether they might not have dispensed with a manufacturer's patent, and have secured a similar result; but the painful fact remains that the task would have been attended with considerable trouble, and details would have to be mastered. It is the mastery of details which seems to be the great obstacle to sanitary progress, and if this could be once removed, the engineer and practical sanitarian could no longer throw in the teeth of architects allegations of "inexperience" and incompetence. Might not the Institute and the Association, who have so recently encouraged discussion on these matters, establish classes for the purpose of cultivating a closer alliance between the builder and plumber, or rather between the architect and sanitary engineer, with a view to solve some of the difficulties which at present beset the former? Such discussions as those which have followed the papers read by Mr. E. C. Robins and Mr. Ernest Turner are not fruitless if they lead to mutual conviction that the work of the architect is not to study drainage and ventilation as if these were the only objects of his attention, but to learn with a good grace whatever sanitary science has to teach, just as he learns, or should learn, the other rudiments of his profession.

THE WATER QUESTION.—II.

TO prevent floods the first thing to be done of a practical nature is to ascertain the quantity of water the river will carry off in its normal condition. The normal condition of a river must be taken to be, not its original condition, and not, in most cases, its present condition, with all its obstructions, some useful and others not so, but such a condition as that would be which would allow the continuance of weirs established for useful purposes in suitable situations, the construction of which is such as to obstruct the passage of flood-waters in the least practicable degree. All other obstructions should be removed: they consist of shoals, formed by reason of continual neglect of the preservation of the regimen of the river, and of small and unnecessary weirs.

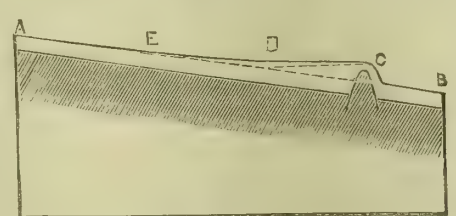
Floods, if by that be meant the whole amount of water falling in great rains, could not be "prevented" by anything that could be done, but that is not the meaning; although on some occasions the question has been presented in that light and that answer given to it. The prevention of floods means, practically, the prevention of the injurious overflow of rivers, and this means the storage or regulation of the excess of the heavy rainfalls over and above the carrying capacity of the rivers. There is a practical limit to the quantity of water which can be stored in any district; it is a limit defined by financial economy rather than by the absolute possibilities of things without any such regard; but the question of storage, in

connection with river improvements, has not always been considered in the proper light. The storage required is not of the same nature as that required for the supply of towns, except subsidiarily, and for a comparatively small portion of the water to be dealt with; it is rather the regulation of the flow of the excessive rainfalls than the absolute conservation which is, in this case, the object of "storage," and this takes it out of the category of those impossibilities which have sometimes been said to exist in this matter. The first thing, then, to be ascertained is the quantity of water the river will carry off in every part when its regimen has been restored and amended through those lands which are liable to floods; and then to regard the storage and regulation of the flow of the remainder. It has been said that they are separate questions; but they cannot be so, and unless they be considered together, in the first instance, and before anything is done in the improvement of the river itself, it may well be apprehended that either too much or too little will be done in that respect. The apprehension lies not so much against the engineer as against the politician, who may, perhaps, limit his view of the water question, in respect of floods, to the improvement of rivers only, regardless of the concurrent question of the regulation of that further quantity of water which the rivers cannot carry off as fast as it falls. If he do the one thing only, he will have to make an undue interference with existing water rights in the river, and, besides that, he may damage the adjoining land in dry times, more than would be compensated for by their relief from floods. By this, too much would be done; and if, on the other hand, the water rights be duly respected, and at the same time the required moisture in the adjoining lands be maintained in dry weather, too little would be done, for floods would still be frequent; and the water question is not one in which a given expenditure of money confers a benefit strictly in proportion to its amount, as witness the attempt to improve the river Nene; whereas if that scheme had been fully carried out as it was laid down by the engineer, and the work had been begun where the Act of Parliament directed it to be begun, that is, at the outfall, the money now lost would have contributed *pro rata* to the benefit of the whole work, and would have been spent with advantage to the land and river alike. This is not, certainly, an instance in which storage formed any part of the scheme; but it illustrates as well as any other the unwisdom of not going far enough.

In considering the question as a whole, the circumstances of the case should be considered downwards from the summit of every hill, and a comparison should be made between the original and natural state of things and their state to-day under the requirements of the inhabitants. There is plenty of evidence that the higher portions of the land we inhabit have been denuded of their finer particles and fragments by the force of water, falling in the first place as rain, which have been, and continue to be, carried down towards the sea. Whether this has always been so or not, it is certainly true of the present time and circumstances, and may without doubt be said to have been true of the circumstances of river basins before men became the proprietors of the land. It is between that time and the present that it is desirable to institute a comparison, in order to see whether the owners of the higher lands should, in justice and reason, contribute to the relief of the lower lands from floods. The denial of the upland proprietor that he contributes in any way personally to the injury of the lower lands, and that he only transmits what falls upon his land by no act of his own, holds good in respect of the water, but of the water only. If the upland proprietor allows the soil and fragments of his land to be discharged into the river he does not exercise the power he possesses to maintain his property without injury to his neighbour. It is not to the point, and does not satisfy the sense of justice, to say that he cannot prevent the soil being washed away by the rains in the natural way. He claims to exercise a right over the soil, and the sole right, to the exclusion of whomsoever, and it could easily be shown, as against him, that if he will he can keep the soil and *débris* of his land upon his own premises. That he will not go to the expense of doing this is reasonable enough, but it spoils his argument that he does not contribute to the injury of his neighbour.

To revert to the original order of things, the natural conditions are that the débris of the higher lands is washed down into the river by the rain, but also under the natural conditions of the river it was carried towards the sea, much of it being spread out and deposited along the valleys by the heavier rains, raising the land into the present meadows. Many proofs of this are found in the excavations which have been made for sewers, bridge foundations, and other works in valleys, where old roads and implements have been found at a depth of several feet below the present surface—as much as 5ft., certainly. This, of course, amounts, even in one river-basin, to a vast quantity of earth deposited in the valley, but probably much more has been carried down into the sea by the river, the heavier rains causing such a scour along the bed as to maintain a sufficient channel.

A good deal is said about weirs across rivers being the cause of floods. As a general proposition, that can neither be maintained nor denied. All that can be said is as to some particular weir, and with reference to its circumstances, which must first be known. The extent to which a weir influences the height of the water in the river above it—the amplitude of the backwater—can be found approximately for any weir, the circumstances of which are known, together with those of the river. The accompanying sketch is a section of



such part of the river above a weir as is influenced by the backwater, the vertical scale being greatly disproportionate to the horizontal.

If A B represent the surface of the river in its original state, and a weir or dam be erected in the position shown, the water will pass over it at a height C due to the quantity and the length of the weir. If from that height C a line be drawn horizontally backwards until it cuts the surface of the original flow at D, as represented by the dotted line C D, that distance, from C to D, will be about half the distance to which the surface of the water in a regular channel will be influenced by the erection of the weir; that is to say, it will be so influenced as far up as the point E, twice the distance C D. The authorities give the distance C E as being from 1·5 to 1·9 times the distance C D; but if twice that distance be taken, it will allow a margin for error, and will give the utmost limit of the backwater. From that point upwards to the next weir the river remains uninfluenced by the weir below; but it is only in rivers with considerable fall, or where there are but few weirs, or when the weir raises the height of the water but little above its original level, that there is any great length of river thus uninfluenced, in the ordinary state of the flow of the river; but the influence of the weir becomes less and less as the quantity of water coming down the river increases, until, in a very high flood, when the weir becomes drowned, its influence in checking the flood is but little. The late Mr. E. Leader Williams gave evidence before the Select Committee of the House of Lords on Conservancy Boards in 1877, that when the Severn Navigation Commissioners were before Parliament for authority to construct these weirs the question was fought over for nearly six weeks, and the result was that he arrived at a form of weir which not only pens up a certain quantity for the purposes of navigation, but facilitates the passing off of the flood water as well. It is a solid weir, with a level crest from end to end, and without sluices or means of passing off the water other than over its top. The back of the weir is rounded off to a parabolic curve, instead of being, as most weirs of the kind are, flat on the top. This improved form gives greater velocity to the water passing over the weir, and reduces its height for any given quantity passing over. This, however, is not the curious point to which allusion is made above; it is that before a weir is formed the flood-water runs over a rough bed, there being at the first of the flood but little water in the river—but meaning, presumably, only in the case of the Severn, or similar rivers—and, therefore, meeting with great obstruction to its flow from that roughness, whereas, when the weir is erected, it forms a pool of comparatively still water above it, through which the flood passes more readily than it did before; indeed, directly the first of the flood touches the upper end of the pool, it sets in motion the whole mass of water, and it is discharged more rapidly than it would be if it came into an empty channel. This was supported by Mr. J. H. Taunton, the engineer of the Thames and Severn Canal Navigation. It has been proved to have been practically so on the Severn, and that is much to the point; but it would not be justifiable to consider this proposition as having reference to rivers in general. In order to still further reduce the height of the water due to any given quantity passing over the weir, the length is greatly increased by constructing it aslant of the river course, making it, for a river 150ft. wide, 500ft. long, or thereabouts; and besides the effect which the increased length has in reducing the height of the water passing over it, the form in which the back of the weir is constructed, being that of a parabolic curve, has another effect in the same direction, for, compared with a weir which has a flat crest, this form of weir causes an increased velocity of the water in the ratio of 5 to 7. This is so when there is a free fall over the weir, but in high floods the boat traffic passes over these Severn weirs instead of through the locks, the weirs being submerged and the water-surface nearly level.

BOOKBINDINGS, ANCIENT AND MODERN.*

THERE are probably few of the artistic industries which have suffered so much from modern mechanical appliances as the art of the bookbinder. It is only natural to assume that when books were transcribed by the monks, who expended the best part of their lives on the penmanship and illumination of Bibles and missals, their bindings should have been thought worthy of an equal expenditure of artistic labour, but that

* Bookbindings, Ancient and Modern. Edited by Joseph Cundall. London: George Bell and Sons, York-street, Covent-garden.

as soon as typography and the multiplication of books took the place of hand-labour, the art of the bookbinder declined. With the multiplication of mechanical appliances, so surely did the fine-art element disappear in this country, that it was not till the reign of Queen Anne that any improvement in this respect took place. Mr. Joseph Cundall has just brought out a handsomely got-up volume, "On Bookbindings, Ancient and Modern," dedicated to Sir Henry Cole, K.C.B., an amplification, it would appear, of a book published some years ago on the same subject, but long since out of print. Mr. Cundall's work is an exhaustive treatise on the subject, and the illustrations of bookbindings, which form so attractive a feature of the present volume, have been chosen, the author says, as "being remarkable either for their propriety or their beauty."

The art of bookbinding has been made the subject of many learned treatises. S. Frognall Didbin's "Bibliographical Decameron," Arnett's "Bibliopegia," and the works of E. Fournier on French bookbinding, and Wheatley are well known, and, with many others, have been laid under contribution in the book of Mr. Cundall. The author shows that the art of the decorative bookbinder, as a recognised art, reached its climax in the 15th century, though previous to that period, and before the editions of the classics, the external bindings of illuminated manuscripts were often enriched with precious stones, and silver plates inlaid with costly gems. Mediæval volumes, such as the splendidly bound "Gospels," were chained to reading-desks and lecterns, and the baronial castle could often boast of its treasured volumes, which were prized so highly that they were attached to a table in the great hall. Mr. Cundall alludes to the splendidly adorned "Gospels" given by Leo III. to various churches, sometimes decorated with pure gold and precious stones. These adorned the high altar.

Glancing over the earlier history of the subject, and omitting allusion to the bookbinding of the ancients, as seen in the Assyrian collection at the British Museum, or the books of the Greeks and Romans—the latter of whom, it must be remembered, had their bibliopegi or bookbinders, and advanced the art to a very high state, according to the allusions given by Horace, Catullus, and other Roman writers—we may refer to the sculptured diptych as giving a faint idea of the earlier forms of the art, and especially to the bindings of the Byzantine artists, ornamented with colours and gold, bas-reliefs and enamels. "In the bindings which have been preserved of the 6th century," says the author, "precious stones begin to play a prominent part; 'Byzantine coatings,' as they were called, were principally of metal—gold, silver, and copper, gilt—into which the jewels were introduced. We must not forget that as we approach the Middle ages the bindings and the manuscripts which they enfold often belong to quite distinct periods." Cameos and intaglios, Byzantine or Limoges enamels, and bas-reliefs of ivory or metal of different periods and characters are mixed together, adds M. Libri, and he illustrates this "singular mode of botching" in an "Evangelarium" taken from La Sainte Chapelle, now in the Paris National Library. The fact was, the goldsmith claimed the external ornamentation, the artist the interior adornment, and the binder the mechanical part of the work. The "Silver book of Ulphilas," a book of the Gospels translated in A.D. 370, is an example of the style of earlier decoration. A beautifully executed book-cover in carved ivory, probably a MS. binding of the gospels, is illustrated by a fine photograph, and forms the first plate in the book we are noticing. It is now in the South Kensington Museum, and belongs to the 9th century; the cover is divided into three long panels, the Virgin and Child occupying the centre panel, while the bottom panel, extending the whole width of the book, has a representation in relief of the Nativity, and the corresponding one above has an emblematic design. The whole is in low relief, the panels divided by a bold cable moulding, or bead and reel enrichment.

The age of Charlemagne was one of great advance in the art, and Italian artists and workmen were employed. Leather and carved wooden covers, plated, ornamented with clasps of gold or silver; or gold plates set with precious stones, cameos, and other choice ornaments were common; a fine specimen of this form of binding in the British Museum, composed of a border of raised panels, and a central panel with figure of a saint, is illustrated. The ornamentation is massive, composed of silver plates with crystals and gems. So valuable were covers indeed, that after the goldsmith had finished his work the bookbinder placed over it a covering of thin leather or rough silk, called a "sendal."

The monasteries offered every facility for transcription and binding, and the monks enjoyed the privilege of both writing and binding; they prepared the parchment and leather, the latter being made chiefly from stag-hide. The real cover was made of wood, sometimes pine; but afterwards wood fell into disuse, as it harboured decay, and bindings were made of pasteboard, manufactured from old manuscripts. The Crusades, says the author, fostered the production of elaborate bookbinding, and the Arabs excelled in the delicacy and beauty of their bindings. Among the illustrations of Mediæval covers, a German manuscript of the 12th century, bound in gilt metal, decorated with champlevé enamels, crystals, and gems is given; the original is now at South Kensington.

The examples of the art after the invention of printing show a marked change in character and style. Calf and morocco were introduced as coverings in the 15th century, the basis being oaken boards in many cases; but the parchment of old MSS. was soon utilised in the making of covers after the introduction of paper, and many valuable old books were lost in this way. We read that Agobard's theological writings of the 9th century were rescued from destruction, and that Masson discovered the works of this author, which a bookbinder of Lyons was about to tear up to bind some volumes; the manuscript is to be seen in the King's library. The art reached a pitch of perfection in Italy about this time; board covers were discontinued, and calf and morocco enriched with gilt devices became general. Venice, we hear, was the school of the art, and Aldo Manuzio, the first binder of note properly so-called who set up a press in 1488. The Aldine Anchor frequently occurs. Gold tooling and chased silver coverings were practised, and a highly ornamental style sprung up in Italy, which was patronised by popes cardinals, poets, and princes. Several elaborate specimens of the bookbindings of this period are given by Mr. Cundall, one from the library of the celebrated Tommaso Maioli, printed in Rome in 1509, "Procopius—De Bello Persico." The ornament covers the whole surface, and consists of elegant scroll-work and flowers, with a richly-designed centre. A folio edition of Cæsar may be seen in the British Museum, from the same collection. The Renaissance artists displayed their utmost powers in the elaboration of bindings, and brought all the resources of art to bear. The bookbinding of France in the 16th century equalled the Italian for the sumptuous richness of the designs. Of course Italian designs were reproduced at first, till Jean Grolier and his followers formed a new school of bookbinders. Grolier was a great book-collector, who engaged Italian workmen, and the illustration given by Mr. Cundall of his copy of "Adagia of Erasmus" is an excellent specimen of the style, characterised by rich borders, and a decorative sense of the treatment of leather, which has not been surpassed. Dark brown morocco, ornamented with interlaced patterns, with a centre title, all in gold tooling, was common, and the patterns generally consisted of geometrical linked forms, many with floral devices. But we pass on to later works.

A splendid binding of the 16th century, with the arms and monograms of Henry II., and Diana of Poitiers, shows the richness and striking effect of the interlinked border and folial enrichment. Many had silver clasps and knobs, and the emblems adopted were often suggested by the names of the owners. The doleful style of death's head and cross-bones was not uncommon in the time of Henry III. Among the choicer specimens illustrated, is a binding of the end of the 16th century, from the library of Etienne de Nully.

The chapter on Bookbinding in Germany and England in the 16th century, is interesting. Binding in stamped leather became an important art after the invention of printing in Germany, and the German Bible now in the Museum at Nuremberg affords a striking illustration of corner metal-mounts in bold relief, and an elegant kind of impressed ornament on the side of cover. Another design by Hans Holbein, in morocco, with interlaced ornament, is given. English bookbinding slowly developed; embroidery on velvet was employed largely at first, and such bindings are to be seen in our national collections. Leather came into use with the invention of printing, and stamping with gold and blind tools followed. A very beautiful specimen of a gold embroidered cover of a book, printed at Augsburg in 1613, is illustrated. It is bound in maroon velvet. The author cites numerous patrons of the art from the Henrys to James I., but it is well-known that French artists were employed to bind the principal books. John Reyner, binder to Henrys VII. and VIII., is said to be the first Englishman who did work that could compare with that produced abroad, and several specimens by him are to be found in the British Museum. Grolier designs were introduced in Edward VI.'s time. During the 17th, and early part of 18th centuries, the art reached a high state of perfection, and the examples given are typical of the style. A great patron of the art was Auguste de Thou, whose library contained various costly styles. A beautiful book-cover, of Dutch workmanship, of silver gilt, is one of the best illustrations, dated about 1670, and copied from a cover in the South Kensington Museum. As illustrating the French style of the binding of the 18th century, we have, by permission of the publishers, reproduced plate XXV., showing an example of "mosaic" work, a style of bookbinding introduced by Padeloup, the binder to Louis XV. "In his search for variety, he blended together designs from the glass-painting of the Middle Ages, the flowers and suns of Louis XIV. style, and the fine dottings of Le Gascon. The excellence of Padeloup," says the author, "consists in the solidity of his bindings, in the choice of colours displayed in their ornamentation. He constantly inlaid patterns of lemon, red, or green morocco in bindings of morocco, or taffetas, with linings, and fly-leaves of gold paper." The design we give is the cover of the "Institutio Societatis Jesu," Rome, 1587, in the Bibliothèque Nationale Paris. It is sufficient to observe that during the 18th century the rage for collecting books and bindings was at its height, and it was the custom for authors to collect as well as write books.

Institutio Societatis Jesu. Rome, 1587. Example of Mosaic Work by Padeloup. (In the National Library, Paris.)

Numerous are the names mentioned by Mr. Cundall. The Duke de la Vallière was a great collector, M. Girardot was another, and Gaignat was a third. Besides Padeloup, Dubuisson and Le Monnier were noted designers in morocco. At the end of the work a chronological list of celebrated binders and patrons is appended, and the author alludes to the better taste recently introduced by English bookbinders, though we cannot, from an art point of view, join with him in the view that the binders of the present day, with a few notable exceptions, are eminent in artistic work. But we have no space to follow the author in his later chapters, and may take leave of the work with the hope that his labours will be rewarded, that the learning on this branch of literary production, which Mr. Cundall has brought into a portable compass, together with the beautiful examples of the art he has collected, will help towards a more correct taste, and that modern bookbinding will worthily take its place in the history of the art.

THE STUDY AND PRACTICE OF THE ART OF ARCHITECTURE.*

It is impossible for a professor who enters on his duties under such circumstances as have involved my appointment to this office, not to say at least a few words of somewhat personal character. Three of my brethren who, in succession, occupied this chair within my time, have all been taken away from us within a brief period. One of them was the master under whom I had studied, and to whose varied information, skill, and enthusiasm for his art I shall always feel myself a great debtor. But the last was one to whom many of you students who are here to-night are similarly indebted. Mr. Barry had, as many of you are aware, held the post of professor in this Academy for some six or seven years. His lectures were marked by the variety of the subjects which they embraced, and by the judicial impartiality which it was his aim to show in his appreciation of what was, in his eyes, good in all styles. The sad event which closed his career so suddenly interrupted last year's lectures when their delivery was but half completed. But they are shortly to be published, and will, I doubt not, be well worthy of your study and attention, as containing the advice, criticisms, and views upon our art of one who held a most distinguished place among his brethren. This is not the place or the time to say more on such a subject. But less than this I cannot say on an occasion when all of us would have been so glad that it should still have been his voice to which you listened, and his counsel that you had to accept. There is one difficulty which all professors must feel in the work which is to be done here. It is, as I think, our first duty to think of our students and their good. And in successive years it might be necessary, or, to say the least, advantageous, if the simple truths and precepts which are the foundation of all that is best in art were repeated time after time to the succeeding audiences of fresh students. And so, perhaps, it may matter little if sometimes I repeat what has been far better said before, in hopes that to some at least there may be freshness, instruction, and novelty in what I say. The real difficulty is that a professor who wishes to teach well must, of necessity, inculcate only what he himself believes to be true; and that in dealing with art, as soon as he leaves the domain of simple first principles, he comes upon ground where every view is contested, and each man's art is, to a great extent, independent of his neighbour's. And my hope is that in listening to me you will none of you forget that, after all, what I tell you is intended to be suggestive first of all. If I tell you of first principles which all acknowledge, and then give you advice which seems to sin against them, you may be sure I have not made myself understood, and in any case it is the first principle which must be held fast by. To-night, however, I shall have to confine myself very much to questions which much concern those of you more especially who are students in our Architectural School, but which may, I fear, be comparatively uninteresting to the rest of my audience. In subsequent lectures I hope I may find it possible to deal with questions of a different and pleasanter kind—less elementary, and such as all of us who wish to be artists are bound to interest ourselves in. It is a good rule of the Academy that compels you all—painters and sculptors, as well as architects—to listen to architectural teaching. But no teaching can be worth anything which tries to accommodate itself to the indifference of an audience, and it would be a mistake to assume for an instant that any of you wish to know only a little about any one of the arts, and care only to attend here because the Academy insists upon your doing so. The first test of an artist is that he should feel a real and absolute, if not an almost equal, interest in all the arts, and the painter who does not care to know something about architecture is sure, at least, never to be so good a painter as he might have been, whilst to you students of Sculpture, I would say that my art and yours are so intimately allied, neither in their highest developments being ever perfect without the aid of the other, that it is incumbent upon you, if you would excel, to know much more than merely a little about architecture. The three arts are indeed all dependent on each other. The most perfect building is that in which not only the architectural lines, proportions, and features are all good and beautiful in themselves, but one in which provision is thoughtfully and wisely made by the architect for the best display in harmony of the arts of painting and sculpture. The architect deals with outlines and masses, with light and shade, but for that deeper interest which touches one most, after these general effects have been produced, he depends, except in the vastest buildings, upon the other arts, and he must know and feel enough about them to make him competent to provide for their worthy and dignified treatment. And surely it is not less needful that the painter and the sculptor should be so well trained in architectural detail as to make it impossible for them to do or admire work in which ignorance of that art is exhibited—such ignorance being fatal in its effect wherever it exists or is conspicuous. Nor should it ever be forgotten that the study of the most permanent of all the arts has a real value if it leads all artists to consider in their work not only what is good for to-day and for the fashion of the time, but for ages to come, so that it may be looked at with love and respect by their descendants for many generations. So much only do I think it necessary to say by way of introduction to my subject for to-night, which I have selected as being one on which we ought first of all to understand each other, and on which one who is growing old may well speak decided words of counsel to you who are only on the threshold of your career. With what conception of art are you bound, then, to begin your work? The work of the architect is evidently complicated by conditions peculiar to itself. It must be useful first of all, beautiful afterwards. Unless it is useful, it is not really artistic. Usefulness may be exhibited in trifles as much as in the greatest affairs. You must realise that it is not only necessary to learn how to plan a building so as to make it most thoroughly fit for its purpose, but you must learn also how to design every detail so that it shall be the fittest for the place, and for the work it has to do. You must therefore begin by studying how to plan well, and how to build well. Good construction is the basis of good art; though even here a word of caution is required, for new modes of construction may be popular, but not good: and the only test that I know of good construction is the certainty of its being permanent. Unfortunately, you will find that this is the greatest temptation which will assail you from the first in your architectural career. You will be tempted to sacrifice solidity to some fancied necessity for ornament; but it is nevertheless the fact that many very noble buildings, of all ages, are almost absolutely devoid of mere ornament, and that no work which is not solid and well constructed and proportioned, however richly it may be adorned, is ever in the end lastingly ornamental. Consider for an instant in what way this rule affects you when in practice. The Egyptian and Greek remains—quite apart from any intrinsic beauty which they possess—affect everyone by the evidence of their

* Lectures on Architecture to Students of the Royal Academy. By George Edmund Street, R.A. No. 1: delivered Monday, Feb. 14, 1881.

admirably solid mode of construction. The somewhat unsightly masses of brickwork which are all that are at first seen of some great Roman works, such as, *e.g.*, the Baths of Caracalla, affect the senses in the same way. In Mediæval times, it is when you are traversing some passage formed in the thickness of a wall that the same feeling is excited, and in all these cases it is the respect for his work which the builder shows that reacts upon us. Nothing is ever entirely unworthy of notice that is done with this feeling, and as it would be wholly impossible to obtain, as it would also be absurd to demand, the same goodness of design in a mere temporary erection as in a permanent one, so the merit of an architectural work will almost always have some distinct relation to the solidity of its construction. The reason for putting this fact before all others which bear on the study and practice of an art is that if you have but a firm grip of it, all you have studied will bear more fruit, because it will give you in one vital point an infallible critical test for the examination of all architectural work. And if I do not attempt to teach you in my lecture much about the merely practical side of your work, you must never forget that this is in no degree whatever because I wish you to ignore what is absolutely essential, but only because it is seems to me that this Academy of the Fine Arts requires of its professors and of its students that their main devotion shall be to the artistic side of our art, with but such incidental references to its practical side as grow naturally out of or tend to illustrate and explain the other. Such references, even if only incidental, cannot be infrequent. At every turn we are met with the question whether what we have designed is the best thing possible under the circumstances, not whether it is the most beautiful—the best thing in architecture being always that which combines the most sagacious use of the materials available, the soundest construction, and the most convenient adaptation to the requirements, with thoroughly good artistic character and proportion in the mass and in all the details, and some evidence of imagination in the design. The architect has to work under limitations wholly unknown to the painter, sculptor, or musician, and yet his art requires for its perfection no less invention and imagination and loftiness of character. If we look carefully at painters' work, we are struck with the extraordinary extent to which the artist reveals himself in his work. On the canvas of a great painter you see not only the man who sat for his portrait, but almost equally the man who painted it. In a more subtle way the architect is revealed in his work. His refinement or his coarseness, his love of truth or indifference to it, are always evident. In the highest art it is the man rather than the society or the system that is seen; and as in ages when insecurity of life, tyranny of rulers, ruthlessness, or religious intolerance, were rife, their very existence involved that of men of the strongest and most heroic character, so in the same times the greatest buildings were erected. The individual man lived often a higher life, and had a higher conception of his work, than is usual in more easy and perhaps more polished and virtuous times. At the same time, though, the highest art is a reflex of the spirit of the man. The man is dominated to a great extent by the age, so that the spirit of the age is seen more or less in the architectural works of all times. Our own history will be read in ours possibly long after all other records of its work are lost, and it lies with us to secure that the record shall be that of the best features, not of the worst of our times. The lesson for you is obvious: you must cultivate in yourselves a high sense of the requirements of your art, and a persistent self-reliance and individuality. Without these you cannot be great architects. And it is more necessary to insist on this with you than with your brethren of the brush and the chisel, because your daily life may be, and too often I know is, spent in working under influences wholly hostile to this higher view. It is well to speak thus to you who are still young, and who, being so, are also generous, and I hope enthusiastic. You will soon cease to be young; but unless you maintain to the end the other qualities you will not be great artists. There may, of course, be enthusiasm of a certain sort for bad things. Many of us, I fear, fancy whilst we are doing commonplace, if not vulgar things, that our work is worthy to excite it, never really realising any of the necessary conditions. And it is worth while to ask, therefore, what is it which really does create our enthusiasm in ancient examples? Enthusiasm is not merely the highest kind of interest. This may be kindled by historical associations; but a bare field on which a battle has been fought has this. Extreme age gives interest, but it need not be lovely. Singularity of situation, of material, of adaptation to exceptional purposes, may all give interest. But none of them create real enthusiasm. And the only architectural work which does excite it is that in which you find evidence throughout, that the artist thought nothing of his own part in it, but only of the perfection of his work, of its solidity first, and then of its refinement. Try by this test such buildings as the the Parthenon, the Temple of Neptune at Pæstum, the Campanile at Florence, Amiens Cathedral, or the choir of Westminster Abbey, and you will find that all possess these qualities, and all of them kindle undying enthusiasm. Once learn to see that such qualities exist and produce their effect, and you have made one step at least towards possessing them yourselves. Nor is it necessary that you should have any hope of exhibiting your qualities on buildings of such importance as those just mentioned. Recollect that in Athens, in Italy, in France, and in England small works have been at least as interesting and perfect as large ones, and that no artist depends upon the largeness of the work given to him to do for the opportunity of showing his real worth. I recollect when I sat in your place hearing one of the greatest of my predecessors—the illustrious Cockerell—declare that the most perfect thing he had ever designed was a scraper; and, strange as the illustration is, he was serious, and justified in being serious in such a view. It may be argued that in ancient times there was an intuitive rather than a conscious recognition of the need for refinement which I assume to be necessary; but this I am inclined to doubt. What, for instance, is the story of the long and slow development of Doric architecture, but one of an attempt to secure more refinement by the gradual perfection of every detail?—the enthusiasm for what had gone before being the stimulus to greater perfection, and the refinement being the consequence of the enthusiasm. Or, again, in the whole history of art, is there a more interesting chapter than that of the gradual development, by repeated changes and modifications, of the circular Roman and Byzantine buildings, through the Romanesque apse into the intricate and beautiful complete Gothic chevet of the French churches?—a development which was gradual only in the sense that we can trace all the steps by which it proceeded, but which, as compared with the slow and patient development of Egyptian and Greek art, astonishes us by the rapidity of its proceedings, the fertility of imagination shown by those who conducted it, and the vast and complete change in all architectural forms which in a few years was achieved. Some among you may have no enthusiasm for your art, and may have no interest in such evidence of what the architects of old must have felt. You may have been told to be architects, not because you refused to be anything else, but because the profession seems to offer a fair mode of getting a living. This is to reduce your art to the level of the basest trade, to deprive yourselves of all chance of real success, and to condemn yourselves to a career of mediocrity which will benefit neither you nor your neighbours. If there are any such students here let me beseech them to take a new view of their duty, and to cultivate, by every means in their power, the frame of mind I have been describing. It does not lie in the power of everyone to become a great artist. But it is in the power of even the least gifted among you, by cultivating his reverence for the ways and work of great artists, to make it impossible that he should ever be guilty of anything wholly bad and contemptible. Consider what a glorious inheritance you have! In every part of the civilised world, the architect whose eyes are open finds, on all sides, works which speak more forcibly, the more he examines them, the great and eternal lessons of his art. He, above all men, has a delight in the past, because he can read better than others the most permanent and intelligible of its visible records. If he is wise he never ceases to learn, for the examples he has to study are of inexhaustible number and variety. Even if circumstances compel him to limit his studies to his own country, there is no cause for regret; for I suppose the man has not yet lived who has seen all that is worth seeing, even of English architecture; and as much may often be learnt by the patient study of small works as by more ambitious attempts to study, to group, and to analyse the origin, principles, and developments of the art all over the civilised world. When you have resolved to look at your work in this spirit, you must be reminded that there are some minor conditions of success which I do not think beneath notice here. Your first business is to become an accomplished draughtsman. As you will hear presently, good architects have existed, and may always exist, who do not draw well; but no one can safely say to himself that he will elect to be numbered among them. Architectural draughtsmanship is a good training for everyone, because its first essentials are clearness and accuracy; and the man has to depend very much for his knowledge of the effect his work will produce—must learn so to represent it on paper as to insure that his drawing is a fair representation of its effect. The habit of tinting and shading architectural elevations is a bad one, and not to be encouraged. It is a simple waste of time. In outlining geometrical drawings, as well as in sketching, never use a very hard pencil, and make up your mind in the latter to dispense almost, if not altogether, with indiarubber. The essence of good architectural drawing is not only that it should be clear and accurate, but that it should be done positively and once for all. Nothing is more fatal than a slovenly and tentative habit in architectural draughtsmanship, and if you indulge in it you will find it stand much in your way when you attempt to make original designs. When you draw these, the first thing that you must endeavour to accomplish is to acquire the habit of seeing in your mind what you want to draw before you draw it. To see some men draw one might almost suppose that the pencil was gifted with the miraculous power of making a design, so little does it seem to be certainly guided by the hand that holds it. The habit of picturing your design to yourself before you draw it would save a great deal of this confused sort of work. Knowing what your intention is, you have then only to put it on paper; but if you have not taken this preliminary trouble, you will never work with half the accuracy or speed which would otherwise be possible. Good draughtsmanship is a necessity in these days for a really accomplished architect. It is impossible in this respect to put ourselves exactly in the position of men who had not our facilities and our system of education. It is true we are not better artists than they were; but in one sense we can draw better, and are, therefore, bound to do so. I am not aware that any one knows how a Greek architect set out his design. And as to the Mediæval draughtsman, we know, by such books as that of Wilars de Honicourt, a 13th-century French architect, that an architect's drawings then were something like children's drawings now. And even at a later date the still extant original drawings for such works as the front of the church at Louvain, the Steeple of Ulm, and the Cathedral at Köln were strangely unlike the exact geometrical drawings which we are able to make. These drawings—published in Moller's "Denkmaler" and Hollar's drawing of the Steeple at Mechlin, engraved, no doubt, from an original drawing, affords interesting illustrations of this kind of elevation. You will find that though they are in elevation, they are frequently so far put into perspective as to exhibit at all points the plan or horizontal section of the work. Both the drawing of elevation and plan are, however, so slight, that it must have been impossible for any architect to have satisfied himself without further details, and these, there is some evidence to show, were set out by the architect himself at large on a floor specially provided for the purpose. Such a floor exists in the work-room over the passage to the Chapter-house at York, and at Limoges the original setting-out of the groining was found by M. Verneille in a similar position. Possibly also, models were more used than they are now. At Louvain is still preserved a most exquisite model, cut in stone, of the complete design for the west front of a church, which itself has never been completed. When compared with the design, which is also preserved, it is seen that the model represents mouldings and traceries with an exact accuracy

which is not attempted in the drawing. But the making of a model by an old architect, in place of a careful geometrical drawing, is no excuse to any one for making careless drawings in the first place now. They are sure to lead to careless details afterwards. Too many of you come here wholly ignorant of all works on your art. Many of them, to which it is always easy to gain access, will give you more evidence of the best kind of architectual drawing than any verbal hints can. But you will find that in these there are united clearness, accuracy, feeling for detail, delicacy, and conformity of line, and you will find no backlining to mark the supposed shaded side of projections, and none of those provoking splotches of black which are unhappily so much in favour with some young draughtsmen. A power of drawing in perspective is of the first importance on two grounds: first, that without this knowledge your enjoyment and success in sketching will be very small; and, secondly, because it will render it more easy to you to realise the effects of your building in perspective, without having the trouble of making a careful drawing or a model, to convince yourself of its real appearance. Without this power you will hardly be able to realise the real light and shade of a design; and without this ability it were better never to attempt to make a design at all! The delicacy of draughtsmanship on which I have insisted will lead to refinement in other ways. An essentially vulgar drawing may be made of a refined building; it should be your aim to let the drawing itself have that air of refinement also. You are, all of you, armed with mathematical instruments the like of which no age before our own has ever seen. Remember that these are useful servants and no more, and that whenever you can do so, you had far better use your hand in place of your instrument. You cannot practise this too much or too steadily. Draw accurately, firmly, and, as far as may be, with a single stroke, the outline of a Greek or Etruscan vase, the volute of a good Ionic capital, the sections of Greek mouldings, and equally of our own English mouldings of the 13th and 14th centuries. The hand trained in this way is, believe me, a much better servant than the bow pencil. The curves which can be drawn by a trained hand, under the guidance of a trained eye, are far more beautiful because more subtle in their variations and prolongations than those of any instrument; and I insist on this point because, unhappily, the bow pencil, and not the hand, is at the root of almost all the so-called ornament of the nineteenth century. Another habit which it is desirable to encourage is that of representing with a few lines the effect of several. In drawings to a very small scale the attempt to represent every line of moulding and detail is sure to be a failure as well as a waste of time; and the selection of those lines which are essential is always evidence of good draughtsmanship. This cannot be done without a real knowledge of the character of the details. And as no one can draw a building accurately without this knowledge, I need hardly say that it is very far from a waste of time for a painter to give some attention to architectural detail. Some of Turner's pencil-drawings are capital examples of his power of indicating so accurately the details of a building, that no one need be in doubt as to the style in which it is built. He could not have done this unless he had educated himself by the study of architectural detail, and his example ought to be followed by every painter-student who wishes to be able to introduce any architectural features into his pictures—as who does not? One word of caution is necessary here. The power of making good and attractive drawings is of immense value, and may make a vast difference in your prosperity and success in life. But it is a means only, and not the end. It has its dangerous side. It is possible to make a design look well on paper which will never pass muster in execution. Nothing is more suicidal than this; but, unfortunately, there is nothing against which it is more necessary to warn you. If you do devote yourselves to making attractive architectural drawings, do them always, I beg you, with a conscientious determination to represent your work absolutely as it will appear—the real object of working out architectural designs in perspective being the discovery of weak points in the design, so that they may be corrected in execution. When once you are able to draw fairly well, you are prepared for what is the best and widest field of study—the buildings which are the best illustrations of our art. And in these it is well, I need hardly say, to devote yourselves as far as possible only to the best examples. In sketching, it is best at first to err on the side of formality. Draw, above all, clearly and accurately, the ground-plan of every building you visit, for without this, no other sketches are complete, and with it, even slight sketches of the elevations or details are nevertheless intelligible. At the beginning, you can hardly take too many dimensions; your work must be sketched and measured on the spot with equal accuracy. At a later period you will be able to generalise more, and to dispense with this elaborate detail in your studies. In sketching, never make the common mistake of using the commonest paper. Treat yourselves, from the first, to luxury in this one respect. Make your measured sketches in a book, and take care to make your dimensions ample enough to insure the accuracy of the drawing you make from those sketches; but in the case of mouldings, of sculpture, of the filling in of panels or arches, let your sketch be as carefully drawn as possible, and do not depend at all upon your two-foot rules for the accuracy of your sketching. Pay special attention to such points in construction as the jointing of stonework, the design of mouldings meant to meet special wants, as—*e.g.*, the slopes of buttresses, and of other members intended to throw off water, the adaptation of architectural features to their situation, as, for example, the details used near the eye and far from it, and the modes adopted for making them both properly visible, and at the same time strong enough for their place and work. Finally, in whatever style it is that you are most interested, never fail to draw with the utmost care, and to store up in your mind the effect of all the best mouldings you see. There is no part of your studies more important than this. Never believe any one who speaks lightly of the science or art of moulding. (I call it by both terms, because it embraces both.) By no test can you separate good work from bad more surely than by the comparison of the mouldings. A good A good moulding grows out of the necessities of the occasion. It gives us the power of accentuating our lines or proportions in the most positive manner if we choose, or of softening them off so delicately as almost to conceal the transition from one feature to another. Without their aid there is a rudeness—a coarseness, one may almost say—which is offensive whilst with their aid that refinement of line which, as I have told you, it should be your great aim to achieve, is made more perfect, and carried to greater perfection than in any other way. In drawing mouldings, I advise you always to sketch them with as much accuracy as possible, and to a good size, and on no account to depend upon correcting your indifferent sketches by a multitude of dimensions. Your eye, your hand, and you memory will be misled. You will look again and again at your sketches, and will forget all about your dimensions, and so be led to a permanently false impression of their real contour. Remember always that sketches of mouldings alone, without equally accurate sketches of the features to which they belong or with which they are connected, are useless. A well-known book which would otherwise rank as one of the most accurate works on the subject is utterly valueless, owing to an omission of this kind. Arch mouldings are drawn without any plan of the capitals which they support, or of the jambs below the capitals. The relation of one of these to the other is of the very essence of the matter, and unless both are drawn it is really of little use to draw either. In the same way the relation of the mouldings of a window to its tracery, of a column to its capital and base, and of both to the entablature, ought always to be recorded in a sketch. From the drawing of mouldings you will go on to that of sculptured or carved members, and in these it is the effect which was intended to be produced of which you must be thinking. So, for this purpose, I attach but little importance, save as a test of mere draughtsmanship, to the work which you have to do in our schools from casts. All architectural features in which carving is introduced ought to be looked at and drawn in the very place for which they were intended. If a cap look perfectly well hung against a wall, on a level with the eye, it can hardly be suitable for its real position in the building some 50 ft. above the spectator, and a great difference in treatment ought to exist between a piece of carving which is made to appear to do hard service, and another which evidently has no such serious work to do, and is rather the evidence of the artist's pleasure in his work.

(*To be continued.*)

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AT the eighth ordinary meeting of the session, held on Monday evening, the 14th February, John Whichcord, F.S.A., President, in the chair.

The Secretary having read By-law LXXVI., the PRESIDENT announced that, in pursuance of the said by-law, the Council proposed to submit to her Majesty the Queen the name of George Godwin, F.R.S., F.S.A., Past Vice-President, as the Royal gold medallist for the current year.

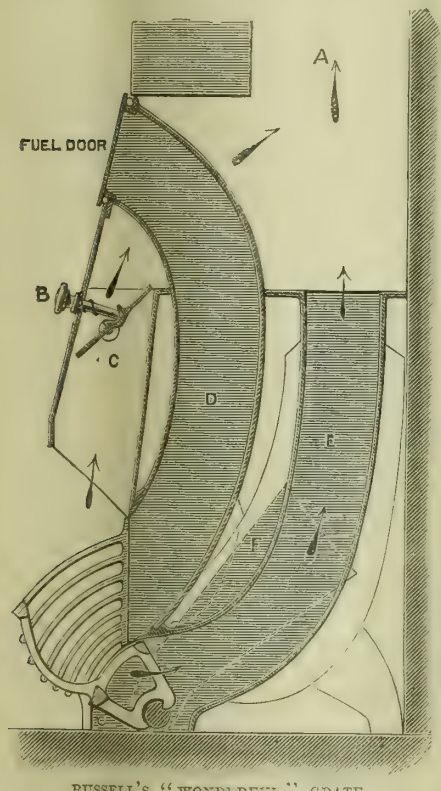
SANITARY SCIENCE IN ITS RELATION TO CIVIL ARCHITECTURE.—WARMING AND VENTILATION.

The discussion, adjourned from the 17th January, of the paper by Mr. Edward C. Robins, F.S.A., was preceded by a description of a system adopted at the City Guilds Technical College, to be erected in Tabernacle-row, E.C., and which resulted from a conference between Mr. E. N. Clifton, Mr. J. L. Bacon, the Professors, and Mr. Robins.

Mr. HENRY DAWSON, having referred to the drainage of buildings, continued the discussion on the subjects of warming and ventilation. He concluded by saying:—I have been particularly struck with the system adopted at the Long Room at the Custom House by Mr. Boyle. I must give my testimony that his air-pump ventilators are really so constructed as to act like air-pumps. They do exhaust the air in the top, and my impression is that they are most useful things, and may be made very valuable for the extraction of foul air from large buildings. To say, however, as is the custom, that there is never any down-draught is saying too much, and when I went up there to examine the system, I found that the outlet-tubes, instead of being as described—carried up straight from the ceiling right up through the roof—have a bend in them, and in that almost horizontal bend is placed a contrivance for the purpose of checking any little down-draught, and there is also a little receptacle for soot. As to the admission of fresh air by vertical tubes, it is made available in large halls, where high enough, no doubt with success. I believe Mr. Robins states that he considers it particularly suited to a room with an open fireplace, and from that opinion I must entirely dissent. I think there can scarcely be anything worse than a room with an open fireplace, into which cold air is admitted by a tube of that sort. I think so for this reason: that my own conviction, scientifically, has been quite confirmed by experience in two instances. At the particular request of clients (against my advice) the system was tried, and in both cases it most ignominiously failed. It failed, as I said it would, from the fact that the cold air—unless the room is at least 20 feet in height—has a rapid upward direction to the ceiling, and is sure to descend again on the heads of the persons in the room, more especially if there is a large open fireplace. When this system of Tobin's was loudly praised, and referred to in the rooms of the Society of Arts, I went there within a few days after, and saw that the system was being tried there by means of open windows. Poor Mr. Le Neve Foster was then there, and I said to him, "What do you say about this new means of ventilating your room? What do you think of the ventilators"? "Oh"! he said, "Confound them all. Ever since these things have been put in, I have had nothing but rheumatism and sciatica." He told me he had moved from one side of the room to the other to escape the current; but it was, he said, impossible to do so. The instances where, by request, I have put it in force, have been attended with the same complaint. Does it not seem palpable that to go and thrust columns of cold air up to the ceiling (of course with the view of purifying the atmosphere of the room) is a course that is unscientific and altogether bad, especially when you reflect that this air is brought down to the level of the lungs, to be breathed by persons who have already expired it. Therefore, I look upon it as a most imperfect system

anywhere. In very large halls, and even in churches, sometimes it may be introduced with impunity or no great harm; but I do submit that the more natural system of bringing in the fresh air at the bottom and carrying it over such a heating medium as hot-water pipes is a far more scientific, natural, and healthy plan. With regard to the Custom House, I found that the tubes (about 6ft. from the floor) were covered over with ledgers. I asked them why this was. "Because we feel a draught," was the reply.

Mr. J. P. SEDDON said that architects could not but rejoice at the sanitary crusade now in progress, trusting that some good might result from it to the community. He welcomed the interest recently shown in the matter by the members of the medical profession, as the public would listen to them, though long deaf to architects, who had piped much longer in the same strain. He wondered whether such learned gentlemen would be surprised to hear that a discussion upon the practical ventilation of buildings was held in this room of the Institute of Architects in the year 1863. A glance at the remarks then made would show that architects were even then alive to the grave importance of



RUSSELL'S "WONDERFUL" GRATE.

A, common flue to up and down-draught.
B, valve to shut off up-draught.
C, up-draught.
D, fuel chamber.
E, smoke-flue for down-draught.
F, counter-balance weight to front bars.

the subject. The speaker, having referred briefly to questions of drainage, afterwards quoted some remarks he had made during that same discussion, which took place several years previous to Mr. Tobin's alleged discovery. Mr. Seddon concluded by referring in laudatory terms to "The Wonderful Grate," the very existence of which, he said, had been doubted by his friend, Mr. William Burges, A.R.A.; and he begged leave to show a model of it lent to him for the purpose by its inventor, Mr. Samuel Russell.

Mr. SAMUEL RUSSELL, having been called on by the President, enumerated the special properties of his grate to be, that it burnt throughout the day and night without attention; that the quantity of fire might be regulated at pleasure; that the intensity of fire might be regulated at pleasure; that when set to any desired quantity and intensity it would continue to burn with but slight variation; that it consumed nearly all its smoke; that the fire was always bright and clear, no black coal being seen; that it was very clean when in use and required no fire-irons; that it gave a large supply of pure warm air; that it burnt anthracite coal, coke, or cinders, or any combination of these; that the chimney-flue did not require sweeping oftener than once in four or five years; that the cost of fuel for it was one penny for six hours; that no coal-box was required in the room. Mr. Russell continued as follows:—For the accomplishment of these purposes the grate is provided with two flues, one passing upwards in the ordinary way from above the fire, the other commencing below the fire and passing up behind it, the two communicating at any convenient point above the fire. At the junction of these two flues a valve is formed capable of being regulated so as to divert the draught in either direction. When the valve is open, leaving a free upper draught, the fire is very mild, and in proportion as it is closed the fire increases in intensity, and produces almost a white heat when quite closed. Thus any fire desired may be obtained by simply turning the knob which regulates the valve. Another portion of this invention consists of a vertical tube or chamber for containing the fuel, the lower end of which opens into the back of the grate. It is charged from the upper end, which is then closed air-tight. The fuel by the action of its own gravity continues to supply the consumption of the fire. The double flue and valve, as already stated, regulate the intensity of the fire. To regulate the quantity the front bars are made to draw forward with a counterbalance weight always tending to draw them back, with a catch to fix them in any desired position. When the catch is removed, the backward pressure stops the fall of fuel, the fire becomes gradually less, and is finally extinguished. By this arrangement a small quantity of fire may be kept burning throughout the night, the bars in the morning being drawn forward, and a scuttle of coal supplied starts it afresh for the next four and twenty hours. As the fuel enters at the back the smoke is evolved from it before reaching the fire, and whether the up or down-draught, or both, are in force, it is consumed, the only escape for it being through the fire. The recess in which the grate stands forms a hot-air chamber through which the external air, or where this is not practicable, the air of the room, passes.*

Professor Ayrton, Mr. Wm. White, F.S.A., and Mr. E. Spencer Rolfe having spoken, Mr. E. C. ROBINS, F.S.A., replied on the whole discussion, and a vote of thanks was awarded to him for his paper.

THE CONSUMPTIVE HOSPITAL, HAMPSTEAD.

THE second Saturday afternoon "visit" for the present session of the Architectural Association took place on the 12th inst., when a large number of members met at the North London Hospital for consumptive patients, at Mount Vernon, Hampstead. The building occupies a triangular site on a hill-top, with roads on two sides, the chief frontage being towards Branch-hill-road. The entire scheme will provide accommodation for 100 patients, but at present only the first third of the hospital has been erected, and this section is almost finished structurally. The architect is Mr. T. Roger Smith, F.R.I.B.A., whose design was selected in open competition three years since, and was illustrated by two elevations and two key-plans in the BUILDING NEWS, December 19, 1879. Mr. Smith met the visitors at the hospital and explained the working drawings, giving full explanations as to the principles and details of construction. The style of the building is Early French Renaissance, of a chateau type, with a high-pitched pyramidal roof, pedimented dormers, square-headed windows, and circular angle turrets; on the garden front of the principal floors is a covered verandah carried on cantilevers. The facing materials are red brick and stone dressings, with red roofing tiles. On plan, the hospital is an isolated parallelogram with projecting angle turrets, the long sides of hospital ranging north and south. It consists of four principal stories and an attic. On each floor is a wide central corridor running from end to end, and placed slightly to the north of medial line, so as to give the larger rooms the southern front. The basement is utilised as out-patients' departments, household stores, and similar purposes. The ground floor is devoted to administration, a board-room, committee-room, and day-room, resident medical officer's and physicians' rooms. The first and second floors are identical, the former being for female, and the latter for male patients. In each is a large day-room, and a series of wards for six, four, and two beds, the present accommodation being for between 40 and 50 patients. On the south side all the windows open with French casements into the arcade or verandah already alluded to; and the south-west angle turret forms a circular nook, 8ft. 6in. in clear, added to that ward. The north-west angle turret is occupied by the water-closets, practically shut off from the main building by a cross-current from windows at inner angles of turret. The kitchen and its dependencies, the servants' bedrooms, and those of some of the nurses, are placed in the attic, following the modern hotel practice, so that the smell of cooking cannot penetrate into the wards. At the eastern or unfinished end of the section already built is a well-stair, and also a manual lift; the grand staircase, principal entrance, boardroom, &c., are to be provided at a future day in the central block. The corridor which forms the main feature on each floor, is lighted and ventilated from the lantern over well of stairs and also by borrowed light from the wards; it is built fireproof in brick arches, carried on iron joists, and Mr. Roger Smith remarked that he had found this cheaper in execution than any of the estimates procured from patentees of special floors. The external walls, where exposed to wind, have been built hollow. An effort has been made to render thoroughly secure the steep-pitched roof; the main braces are carried from corner to corner, so that the principal rafters are hips; collars are thrown across above the ceiling, and an iron is carried over to act as a tie-beam; and in addition to these measures, all walls have been built up into the roof. In the basement some of the rooms are divided only by iron columns, with wooden partitions between, so that, if needed, a large board or meeting-room could be provided. Some trouble was experienced with the foundation, which is on loam, but a greater difficulty was, that, owing to the high elevation, the pressure of water only reached to the second floor; here, therefore, the chief cisterns are situated, a hand-pump and small cistern being fixed for supply of kitchen. The stories are each 14ft. 6in. high, and the cubic space per bed varies from 1,000ft. to 1,200ft. The lower part of windows are filled with large sheets of plate-glass between the mullions, and the upper portions with squares of moderate size. The corridor and staircase are warmed by hot-water apparatus, but each room is warmed by its own open fireplace. In front of the terra-cotta flue an air-space has been left opening into the room near the ceiling, so as to provide additional ventilation when the fire is lit, and vertical tubes are introduced in each room. The flues are made as straight as possible; circular, in terra-cotta, with rough surface, and openings are provided in the basement, so that they can be swept without disturbing the patients. The fireplaces are lined with Minton's tiles, and have basket grates set in shallow semioctagonal recesses; the chimney-pieces are of a green marble, recently introduced by Messrs. Blackmore and Nixson, of Stonehouse, Dent, Yorks, and have an effective appearance; the mantels are very narrow, and of deal, painted. The dado of walls, and the walls of corridor and staircase, are finished in Martin's cement, and the corridor has been laid on each floor with an ornamental border of encaustic tiles by Messrs. Craven, Dunnill and Co., of Jackfield, Salop. The closet fittings have been supplied by Messrs. Doulton, of Lambeth, and the soil-pipes are carried up open into the roof, well above the dormer openings. The future extension of the building has been kept in sight throughout, so as to reduce the amount of reconstruction of existing work to the lowest point. The contractors for the portion now in hand are Messrs. Higgs and Hill, of Crown Works, Lambeth, and their foreman on the works is Mr. H. Unicume; the amount of contract is about £10,000.

* Messrs. Archibald, Smith, and Stevens, of 48, Leicester-square, have since sent us the following note with regard to the stove.—ED. B. N. "Saturday, Feb. 12. Fuel chamber filled at 6.30 a.m. Office closed at 1.30 p.m., opened again Monday, Feb 14, at 6.30 a.m., when fuel chamber was found empty, but fire still burning in grate."

The town-council of Godmanchester, last week, elected Mr. William Baxter of that town as borough surveyor. For the appointment, the salary attached to which is only £52 per annum, there were, as usual, a large number of applicants.

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ILLUSTRATIONS.

FITZJOHN TOWER, HAMPSTEAD. — ST. MARY ABBOTTS CHURCH, KENSINGTON.—ROYAL ACADEMY COMPETITION.—DESIGN FOR A COLLEGE FOR FORTY STUDENTS.—ANGLE FIREPLACE AT RAWDON, HERTS.

OUR LITHOGRAPHIC ILLUSTRATIONS.

FITZJOHN TOWER, HAMPSTEAD.

THIS house is now being completed, from the designs of Mr. John Th mas Wimperis, of 25, Sackville-street, Piccadilly, for Mr. Herbert F. Baxter. A Domestic Mediæval style has been adopted, admitting of much variety of treatment, and is executed in red brick, with black pointing, Portland stone dressing, Broseley tile roofs, ornamental crestings and terminals, with wrought-iron finals to tower, partly gilded. The builder is Mr. William Brass, of Old-street, St. Luke's.

ST. MARY ABBOTTS CHURCH, KENSINGTON.

THIS church has only within the last few months been completed by the erection of the tower and spire but the main portion of the building was commenced about ten years ago. It is one of the largest churches built by Sir Gilbert Scott, and is certainly the most conspicuous as well as satisfactory church from his designs erected in London. A set of working drawings of so important an example of ecclesiastical architecture cannot fail to be of interest, and we have therefore arranged to illustrate the building rather fully, more especially the tower and spire, which were among the last designs prepared by Sir Gilbert Scott before his death. To-day we publish the south elevation and plan, with a detailed elevation of the west front. Other illustrations will follow, when we may be enabled to furnish further particulars of the church. The erection of the tower and spire was carried out under the supervision of Mr. John Oldrid Scott, F.R.I.B.A.

ROYAL ACADEMY COMPETITION—A COLLEGE FOR FORTY STUDENTS.

LAST week we illustrated the selected design in the Competition for the Royal Academy Travelling Studentship, the subject being a college for forty students, and its author was Mr. W. J. N. Millard. To-day we publish the perspective view of the design reckoned second in merit in the same competition. Mr. A. H. Tiltman is the author.

ANGLE FIREPLACE IN OAK ROOM, RAWDEN HOUSE, HERTS. DATE 1622.

THE original of this drawing was exhibited at last year's Exhibition of the Royal Academy; it was finished in sepia, with washes of the same colour. The work is thoroughly characteristic of the period, and of considerable interest, though its quaint symbolism is rather obscure. The figures in the frieze, however, clearly represent the Continents of Europe, Asia, Africa, and America, with the animals, &c., peculiar to each. The stonework is white in colour, and has a charming effect in conjunction with the dark hue of the oak panelling round the room; the framing of the latter, as may be noted, is of very irregular widths.

OXIDATION OF BUILDING MATERIALS.

NEARLY all our building materials suffer largely from the effects of oxidation, the chief causes of this destructive action being moisture accelerated by acids and contact. In the case of metals, it has been pointed out that humidity in the air and in running water act by the formation of the hydrous oxide in proportion to the purity of the metal, and hence wrought iron is more rapidly affected than steel, and steel than cast iron. It is well-known that cast iron has an outer skin, which is much less subject to rust, and, on this account, it is best suited for all exposed constructions, though, even in these situations, the metal should be protected or coated. Cast iron, cast in sand, is more readily oxidised than when it is cast in loam, especially when exposed to galvanic action, and this has been accounted for by the greater smoothness of surface of loam castings. When iron has to be galvanised, the loam casting is decidedly preferable. It is needless to dwell on the importance of protecting wrought iron, and thin plates of it should never be exposed to the atmosphere without protection. Recent experiments have not yet furnished us with any ready and permanent preservative coating for iron, and coatings of zinc or asphalte appear to be the only resources which can be relied upon to arrest decay in iron exposed to moisture or sea water. Crystalline wrought iron is more subject to chemical action than the fibrous and amorphous kind of texture, and according to Mr. G. R. Burnell "the old Swedish iron and the charcoal iron, formerly used for iron railings in the metropolis, has yielded to the effects of the galvanic action of the atmosphere in a manner very different from the wrought iron made at present; which latter, being made from coal, is much more fibrous in texture."

It may be unnecessary to review the numerous patents and preservative processes that have been brought out and tried, and have been given up as inadequate to cope with the destructive action of the atmosphere upon ironwork. Good coatings of boiled oil are recommended for all malleable iron whilst it is hot, and for castings after they have been cleansed. Paints of oxides of lead and iron serve their purpose; but it would be dangerous to trust to their protection for any length of time, and in the case of paints prepared from lead bases, a chemical action is set up between the surfaces; and we should rather be inclined to prefer the application of a coating of gas-tar or asphalte, known as Dr. Angus Smith's patent. Iron coated with this application is found to stand the atmosphere for a number of years longer than any other coating, and the mineral bitumen resists the action of acids and all iron exposed to fumes. Coating the iron with a preparation of pulverised glass with bronze, or copper, also of lead, have been tried with more or less success; but the difficulty is to apply such processes to large standing structures like bridges. Few of our readers have not heard the more recent treatment of iron on the Barff system, by which the articles are subjected to superheated steam at a very high temperature. We often wonder how long some of our iron railway bridges will stand the gradual deterioration and loss of substance they are being yearly subjected to. The steam from locomotive engines upon the iron roofs of many of our railway stations is another instance of rapid deterioration going on, and it may be worth the attention of our engineers to consider the expenditure necessary to keep such roofs in efficient order. The contact of lead and iron is well known to set up a chemical action destructive to iron-work embedded in stone, and the acid in oak is found to act injuriously on iron, as illustrated by the decay caused by iron nails in wooden ships. Much structural injury is due to the combination of iron and stone. The rusting of wrought iron cramps is a common instance due to certain salts of lime, but old cramps and ties closely embedded in mortar, which excluded the air, have been found in a perfect state of preservation. We may recommend Portland cement, as the most judicious fixing for iron in stonework.

The effects of oxidation on stonework are no less apparent in what is known as weathering, and there are but a very few stones—such as the very compact sandstones, and the crystalline magnesian limestones—which are capable of resisting moisture. Of course, stones containing a large proportion of carbonate of lime must quickly suffer from oxidation, especially when exposed to alternate rains and frosts, to damp atmosphere and driving winds, and when their textures are more or less absorbent..

SMOKY CHIMNEYS.

AT this season many are the complaints that reach us of incurable smoke-nuisance in houses, the remedy for which is often within the reach of the tenant or occupier. The usual idea is to place a chimney cowl or some curiously-shaped pot on the top, which may, or may not, effect a cure. Bricklayers are appealed to for a remedy, and they generally suggest the latter as an expeditious mode of getting over the difficulty; the chimney is again tried and the smoke goes up, the occupier rejoicing in the thought that the nuisance is at last abated. But another day comes when the wind may be in a different quarter: the same evil is experienced, and what was thought to be a cure turns out to be at best an expedient that will only answer under certain states of the atmosphere. A speedy remedy involving less cost and trouble will generally be found available. In nine cases out of ten the fault is in the lower part of the flue, the "throat," as it is technically called, this part being so large that the cold air interferes with the passage of the warm smoke. All that is needed is to contract the throat just above the fireplace, which may be done easily by introducing a sloped slate, or forming with tiles and cement a kind of projecting corbel on one side or the back. If this is performed carefully the happy medium is produced, and the smoke, having no cold current to impede its passage upwards, escapes. In building houses, the throat of a flue ought always to be reduced at a certain angle, neither too slowly or too quickly, to the required area of the flue above, and if this point be attended to, the chimney will draw without the inconvenience of having to open doors and windows. A valve to open or close above the fire-grate, provided in some stoves, will generally be found to answer if fitted to fire-places with large throats, but of course this entails the expense of a new grate. It is possible, however, to have a regulating valve to all fire-flues, so that it may be opened or closed at pleasure. Not only might the grievance of smoke be abated by this simple means, but the draught could be regulated to a nicety, and the consequent consumption of fuel, and the discharge of Stygian smoke into our atmosphere be greatly lessened. We venture to think if the Smoke Abatement Committee would turn their attention to the evil of large, gaping chimney mouths, and pass a regulation limiting the size of the throats of our domestic fireplaces, they would be dealing practically with the grievances they are trying to remove.

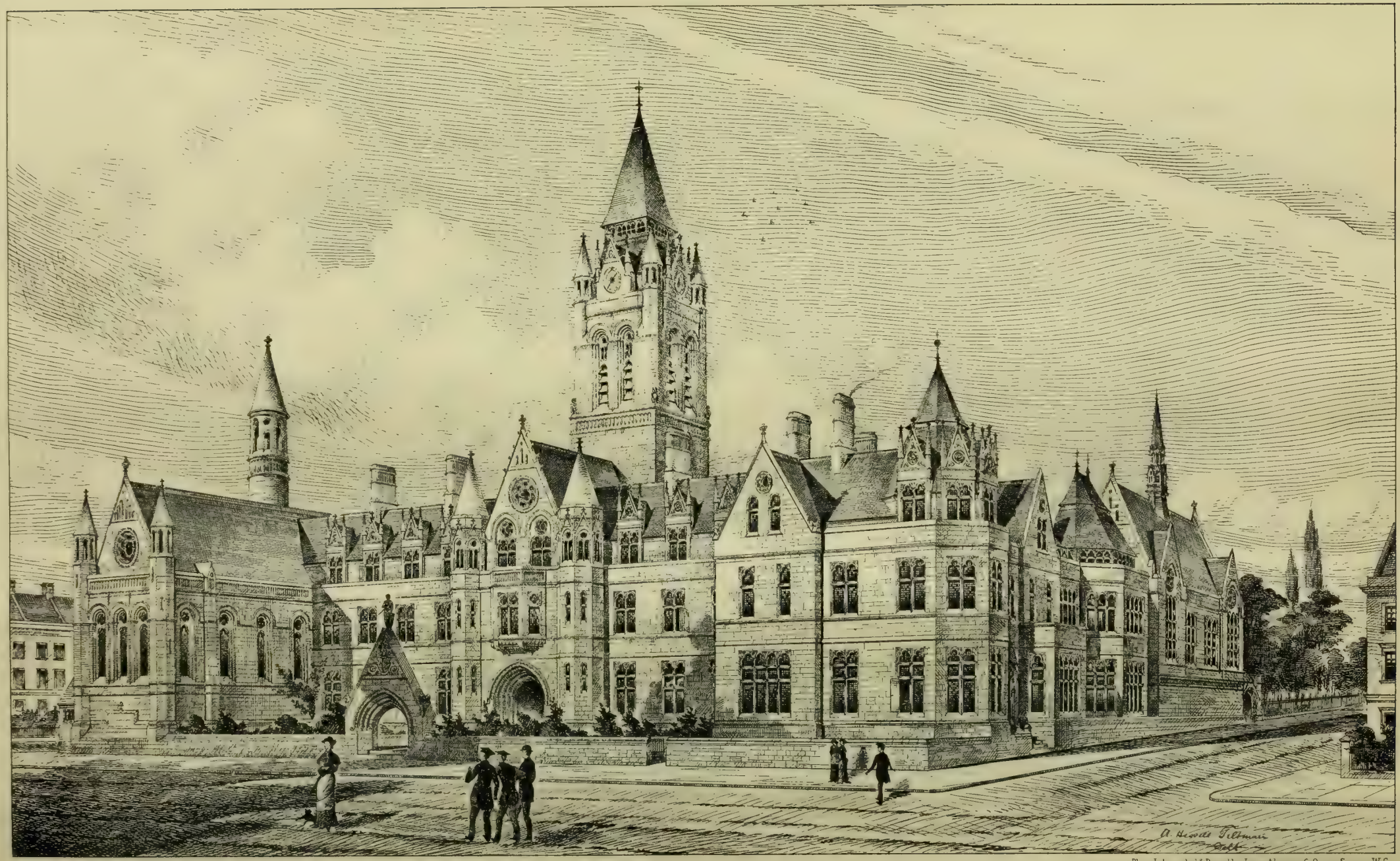
PARLIAMENTARY NOTES.

NEW COURTS OF JUSTICE.—In answer to Mr. Firth and Mr. McLaren, Mr. S. Lefevre said on Tuesday: I have every reason to believe that the new Courts of Justice will be ready for the occupation of the Judges in Easter, 1882. The clock will be placed in the tower in the course of the present year, and I hope it will be seen both day and night.

MUSEUM OF NATURAL HISTORY.—Mr. S. Lefevre, in reply to Sir C. Reed, said on Tuesday: The Botanical and Mineralogical Collections have already been removed from the British Museum to the Museum of Natural History at South Kensington, which, I believe, will be open to the public on the next Bank Holiday—namely, on Easter Monday.

Mr. J. Whittaker, architect and surveyor, was killed on Monday week by an accidental fall from a train near Hindley-station on the Lancashire and Yorkshire Railway. At the inquest it was proved that deceased had been to Wigan on business and went to sleep in the train. Waking up suddenly, he opened the carriage-door on the off-side and fell out, and was mutilated by a passing train. A verdict of accidental death was returned.

Messrs. Chubb and Son, lock and safe makers to the Queen and to the Bank of England, have just issued a new illustrated priced catalogue. It has been compiled by one of the firm. It consists of 28 pages; contains nearly 150 illustrations; the prices of 700 different articles; and no less than 1,100 dimensions of locks, safes, &c. It is stated that nearly *one million* of the patent detector locks have been made and sold.



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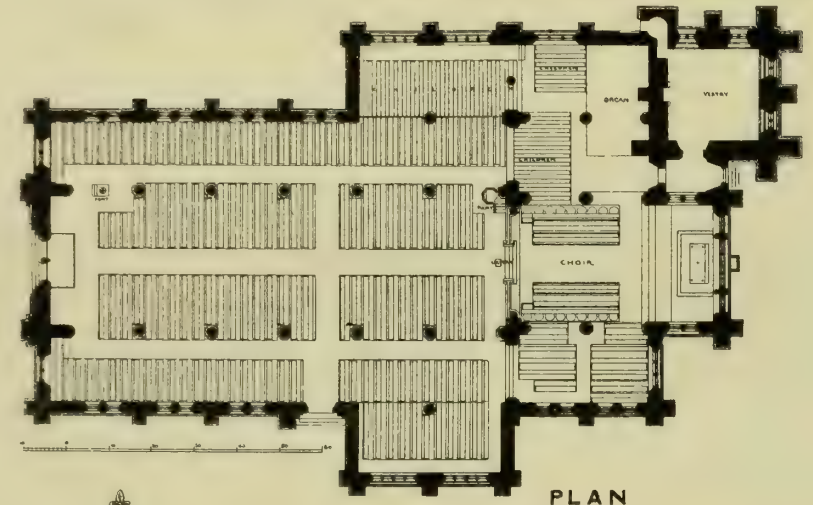
ROYAL ACADEMY COMPETITION A COLLEGE FOR FORTY STUDENTS

BY A. H. TILTMAN, A.R.I.B.A.

S·MARY· ·ABBOTTS· ·CHURCH·

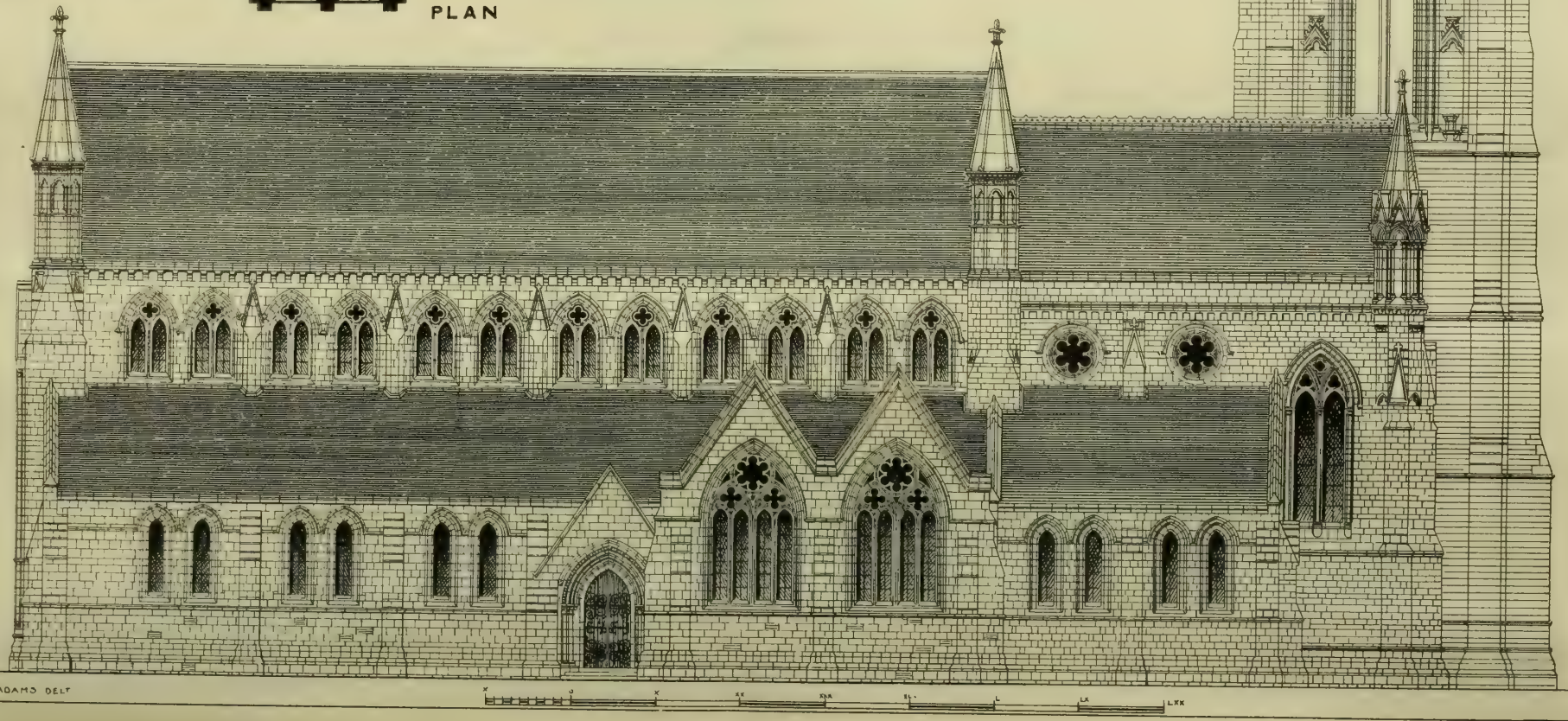
KENSINGTON

SIR GEO. GILBERT SCOTT R.A.
ARCHITECT



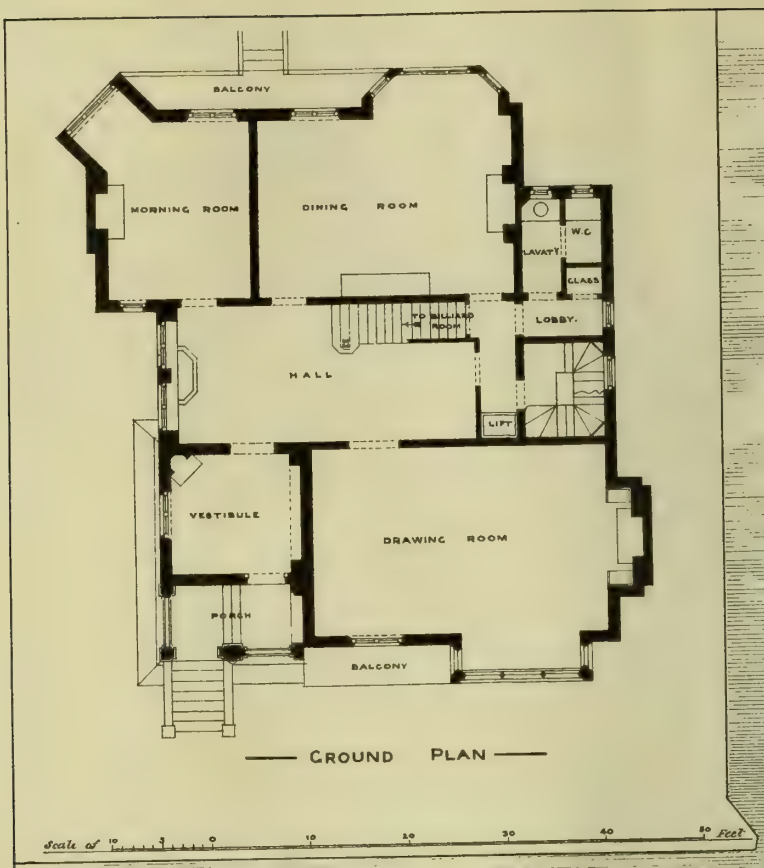
PLAN

SOUTH ELEVATION



MAURICE B ADAMS DELT

Photo Lithographed & Printed by James Akerman, 6, Queen Square, W C


BALCONY
MORNING ROOM
DINING ROOM
W.C
LAVATY.
GLASS
TO BILLIARD ROOM
LOBBY.
HALL
LIFT
VESTIBULE
DRAWING ROOM
PORCH
BALCONY
GROUND PLAN
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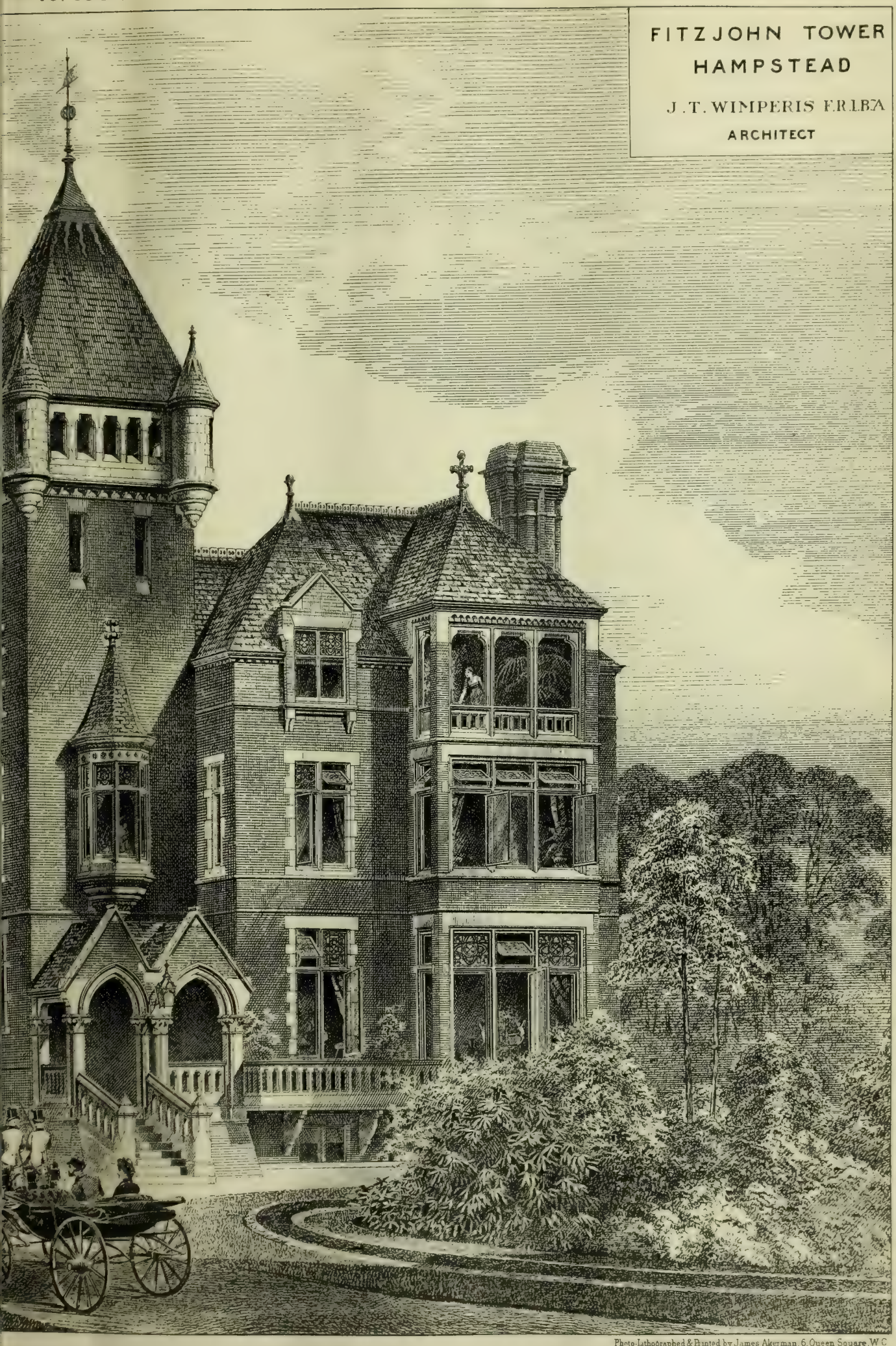

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S·MARY ABBOTTS·CH KENSING~ ~TON·

WEST FRONT

SIR G. GILBERT SCOTT R.A. ARCHITECT.

A

B

C

Scale of feet

PLAN A

PLAN B

PLAN C

HALF INTERIOR

INTERIOR OF DOORS

FLOOR LINE

GROUND LINE

MAURICE B ADAMS DEL.

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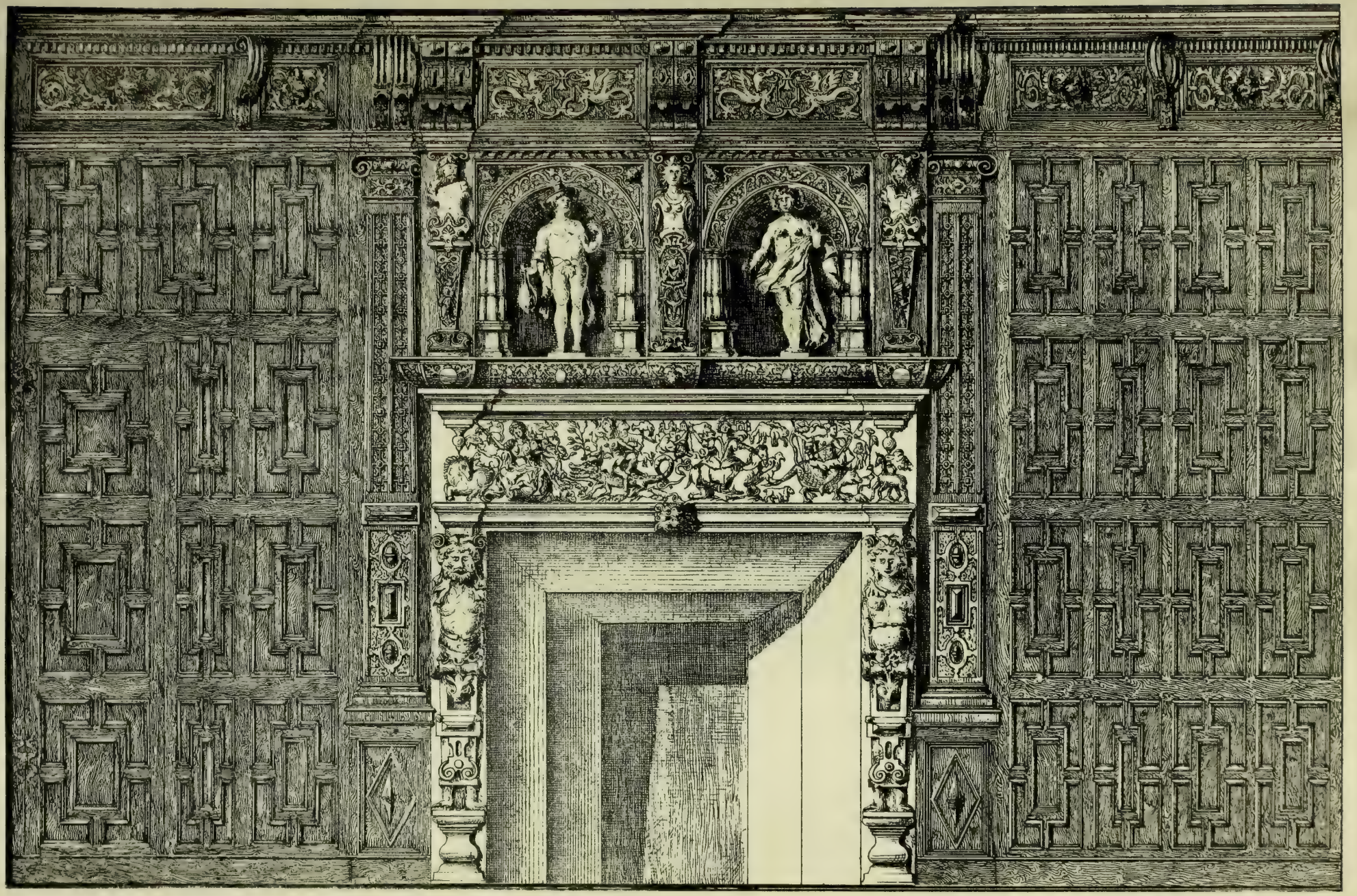

ANGLE FIREPLACE IN OAK ROOM · · RAWDON HOUSE · HERTS .· DATE 1622 · ·

JOHN B. GASS · · del.

THE PRESENT CONDITION OF THE ART OF WOOD-CARVING IN ENGLAND.*

(*Concluded from page* 163.)

LET us turn to a later fashion, that so popular now under the name of Queen Anne. Numerous examples of the woodwork designed by the architects and carvers of the 17th and 18th centuries remain in public buildings, churches, and dwelling-houses. They had fewer decorative resources than their contemporaries in Italy and France. One great name, however, belongs to the profession of wood sculptors of the century, that of Grinling Gibbons. His foliage, flowers, birds, and other details have the sweep and delicacy of Nature, so far as an approach to Nature can be carried in decorative carving. All the carving of the 17th and 18th centuries may be called architectonic. It was put to the service of interior decoration. Houses were no longer built with the great halls already noticed. Churches, however, and large public halls, such as those of Greenwich Hospital, Kilmainham Hospital, in Dublin, and other places, were often screened off from the doors. Such screens are regular and orderly façades, with arched entrances, surmounted by a pediment. The walls of these structures, and of rooms generally, were divided by columns or pilasters, fluted, and with carved Corinthian capitals. The panelling is no longer of the old sizes, but in very large divisions; one of dado height, with tall panels above. They stand well out, and are enclosed within bold roll mouldings, projecting beyond the surface of the panels. Where these panels are of great size, the mouldings were carved. Wreaths of leaf-work stand out in relief on the architraves, that finish the wall panelling; and that surmount the openings of fireplaces and doorways. These doorways, even inside the rooms, are generally covered by a pediment. The picture frames, that form the upper portion of the chimney fronts, are also surmounted by a pediment. Garlands of leaves or flowers, with bold side brackets, in the form of volutes, over which the foliage falls, or from the eyes of which another scroll of leaf-work springs, form the side decoration of the chimney fronts of the more correct Wren period. There are some special features, out of which the woodfitters and joiners of the last century may be said to have made their decorative work, and these are the very elements we want our woodcutters to have at command to-day. First, figure sculpture. In this country, our wood-carvers have never been strong in this essential matter. Even in Wren's time, and that of his successors, beyond an occasional artist, there does not seem to have been any possibility of commanding the services of carvers educated to this extent. We find heads—of cherubs, women, &c.—occasionally well-modelled and finished. But the contemporary Italian and French wood-cutters could beat us out of the field in this respect. Of foliage, the English carvers were masters. That of Gibbons, was of all kinds—abundant, and yet delicate. Generally, he used lime-wood; and his work naturally found its place as an addition to actual architectural details, and was applied to friezes, or placed under pediments, or on the architrave fronts of chimney pieces. In architectural carving of this period generally, the acanthus leaf and the vine are the only ones employed. There is, also, the honeysuckle ornament, and anthemion, or leaf arrangements similarly composed. In later work—Adam's, for instance—the olive, or a leaf of similar shape, was added. Speaking generally, however, the leaf used is the acanthus. It is cut on capitals and under brackets. Portions are composed over the surfaces of mouldings, in a hundred varieties, and with endless inventiveness. Yet it is always recognisable, and helps to preserve the unity of the general design of the decoration. On the furniture of Queen Anne's time you see the acanthus leaf on the bulging legs of chairs and tables; and broken pieces of it on the tops of bed testers, on chimney pieces, and round looking-glass frames. The finer, more wiry work of Adam, and the Chippendale furniture, is decorated with sprigs, or portions of this leafage. And some small Adam mouldings are entirely worked in tiny acanthus, even when the width scarcely reaches three-eighths of an inch. The decoration of wood edges or mouldings takes so large a place in the arrangement of panelling, of picture-frames, of fire-place openings, doorways, and so on, that it forms the most noticeable decorative feature at the command of the carver. It is worth observing how few the mouldings of these periods are. They are derived from classic Rome. There is the egg and tongue; leaf mouldings, billet mouldings, made up of small square dies separated by hollows; bead mouldings; ribbon mouldings (guilloches); square key frets; the Vitruvian scroll; little else. Yet few as these are, the shades of variety to which they lend themselves are endless; partly by the size, partly by the shape of the egg and the anchor, or by carving the egg surfaces, or by various treatment of the acanthus leaf-work, where it covers the surface of the moulding lines. The carvers of the last century cut these in soft pine, over long lengths of moulding; often in beautiful curves and turns of the leaf. A slip of the chisel would have destroyed the side of the doorway. There are examples in the Kensington Museum, taken from old London houses, quite complete, and of masterly execution. Could we be sure of getting such sharp, free-handed work done now? Then as to furniture. Chambers introduced Chinese fret-work, and the Chippendale; cut those delicate pierced cabinet tops, and china shelves, and table edges, which are so highly prized now. The carving of looking-glass frames took the form of little Chinese gardens, with rocks, grottoes, argus pheasants, and other curiosities down the edges. As far as architectural carving was concerned, how very few and simple are the elements of this old work. It is of a kind which all carvers could learn; which will always return full and redundant measure of effect and agreeableness for the modest skill it requires. Some London firms well understand this kind of carving; but only two or three establishments. Putty, or papiermaché, or other moulded imitation, are generally provided by the builder. Look at our picture frames, and the feeble meanderings of putty over their surfaces, and compare them with the simple, honest mouldings of the Vandyck frames. I do not forget the admirable objects we have seen at various International Exhibitions. But these are the results of special and extraordinary exertion of artists, and are monumental—not works that can be placed within the reach of ordinary buyers, or made without excessive cost of time and labour.

In conclusion, we are brought to one or two observations of importance. First, all decorative carving in wood, Mediæval and Renaissance, has been intimately connected with architecture; and, further, has been architectonic in design and details. The tabernacles, pinnacles, and spires of Mediæval stall-work, triptychs, and so on, are designed on the lines of external architecture. So with door pediments—really small roofs—pillars, capitals, architraves, and so on. How is it that wood, so different a material from stone, and being used indoors under such different conditions from those that govern exteriors, should fall under the rules and lines of actual architecture? Ought not all woodwork to be governed by some distinct principle of decoration? Most designers have asked themselves this question, and battered their brains for an answer. The honest endeavours of many architects and cabinet-makers show that an answer has been sought, and the general results show how rarely it has been found. Sooner or later we must all come round to the principle which has prevailed so generally, if not so universally, in the past. Good art maintains its unity. Architecture is the master art. Sculpture and painting find their true places under its shadow. This architectonic character is one of analogy. Wood carving should be suggestive, not imitative, of architecture. It is on a lighter and a broader scale of proportions, in accordance with the continuity of fibre and tenacity of grain of wood as contrasted with stone. Another observation I make is on the extreme simplicity of the elements out of which such endless varities, both before and since the Renaissance, having been produced in carving—one or two kinds of foliage, half a dozen types of moulded edges. Some of these are convex in sections, some concave, some undulating. One of the most dangerous stumbling-blocks to modern carvers, men who have not well read or thought the subject out, is the vast variety of fragmentary examples in museums. They belong to various periods, and represent many phases of change. The student aims at producing something new. In art, novelty—actual novelty—is rarely to be had. The traditions of art, descending through the long ages of the past, reveal to us the unity of principle which they maintain, not less than the simplicity of the instruments, by means of which successes so many and so various have been achieved. All the great Mediæval and Renaissance architects were students of nature as keen and true as ourselves, but they sought variety rather than novelty, in perpetual freshness of application, of few but inexhaustible principles. What they did, sculptors and carvers, decorative carvers, can do in their degree in our days. If to narrow our field is in reality to increase our insight and inventive powers, it follows that modesty, self-restraint, and simplicity of aim should govern our designs of ornamental carving. Look at the decorative carved work, such as one sees, for instance, on sideboards. Some of these compositions are skilfully carried out; but the impression they produce is that of redundance, crowding, want of discrimination, absence of effect, good work often wasted. To compose really well, to know exactly where to stop, and how to make a simple piece of foliage or figure set off the space it fills—to possess what we mean by a correct taste, is partly a gift, partly the fruits of thought and observation. To pick and choose, and mingle together in the search of novelty and variety, is the least likely way to acquire it. If the desire to put too many ornaments is the danger of composition in carving, so to try to follow nature too far is the danger in execution. No leaf, or flower, or other object followed up to realisation, really decorates the freize or the wood-work on which it is carved; it is better to carve it complete, and lay it on a table, or in a cabinet. When we decorate a frieze, or a cabinet, the ornaments are to be portions of the thing decorated, and worked out, some more, some less, according to the size, shape, amount of plain surface, and so on. Leaves die into the surface, or are only indicated over many places, on the bell of a capital, the tympanum of a pediment. Points in the leaf are here and there fully developed. Figures in bas-relief are often of extreme flatness, or partly flat and partly brought fully out and undercut. Much foliage that would be excellent if indicated only, one sees absolutely spoilt by attempts to elaborate petals, leaves, tendrils, and so on. Even natural proportions have frequently to be modified. Opportunities of careful rendering of nature are never wanting to the carver, and his finer skill and deeper knowledge produce their true effect, when he knows how to keep other portions of his work subdued, or but partially defined, and strictly subordinate to architectural requirements.

* A paper read by J. Hungerford Pollen, before the Society of Arts, on Wednesday, Feb. 9th.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Birmingham Architectural Association.—An ordinary meeting was held on Tuesday evening, the 1st inst., at the Rooms, Queen's College, under the presidency of Mr. R. B. Morgan, chairman of the Association. A vote of thanks was accorded to Mr. J. A. Cossins for his kindness in conducting the party on the occasion of the recent visit to the New Science College in Edmund-street. A paper entitled "Some Ideas on the Practical Ventilation of Public and Private Buildings," of which we published an abstract last week, was read by Mr. William Henman. A discussion followed the reading of the paper, after which a hearty vote of thanks was passed to Mr. Henman for his contribution. An ordinary meeting was held on Tuesday evening last (the 15th) at the rooms of the Association, Queen's College. The President, Mr. George Ingall, was in the chair. After the business a paper entitled "Art Workmen—Past and Present," was read by Mr. John Roddis. The paper, which by the courtesy of the author we shall reproduce in a future number, was exceedingly interesting, and at its close, a hearty vote of thanks was accorded to Mr. Roddis.

British Archæological Association.—The fifth meeting of the session was held on the 2nd inst., Mr. Thos. Morgan, F.S.A., in the chair. The discovery of a portion of a Roman sepulchral slab at South Shields was reported by Mr. R. Blair. It represents a mounted pediment, with heads in high relief, and is similar in workmanship to the celebrated slab with the Palmyrene inscription found in the same locality, the site of the cemetery of the Roman

station. Mr. de Gray Birch, F.R.S.L., read a description by Admiral Wood of another tomb at Yllora, Spain, on the estate of the Duke of Wellington, and of a massive gold ring, with a dolphin cut on a blue stone, found in a large coffin at the same place. Miss Brocklehurst and Miss Booth sent for exhibition a series of drawings of the New Grange tumulus, showing the peculiar incised patterns on the internal stones forming the chamber and its approaches. Mr. G. R. Wright, F.S.A., described a memorial stone, supposed to be of a chieftain of the Arthurian period. The slab was found at Yarrow, and a cast of it is in the museum of the Society of Antiquaries, of Scotland. Miss Russel, of Ashistiel, sent a photograph of this curious memorial. Mr. Loftus Brock, F.S.A., communicated the discovery of Roman architectural work, on the site of a bastion of London Wall recently met with in Houndsditch. These consist of a well-wrought base of a column, and part of the shaft of a diapered column of blue stone. Mr. Watkins produced elaborate drawings of the Roman City Wall, Houndsditch, recently discovered and removed for a length of about 70ft. The walling, which was 8ft. thick, was faced with squared stone, with bands of red tiles and a chamfered plinth of dark ironstone, and of great strength and regularity. Mr. Grover, F.S.A., described a recent and remarkable find of Roman remains on the premises of Messrs. Tyler, Warwick-square, Newgate-street. These consist of three large cylinders of lead, each containing an elegantly shaped glass vessel. Coins of Claudius and Nero were also found, and indicated the early date of the remains. The first paper was by Mr. Butcher, of Devizes—description of the progress of the exploration of the Roman villa at Bromham, made by Dr. Cunnington and himself. The second paper was by Dr. Phené, F.S.A., on some recent excavations made in the Mounds of the Troad. The results were reported by the lecturer in detail.

COMPETITIONS.

BURTON-ON-TRENT MARKET HALL.—The premiums for the above have been awarded as under, viz.:—1st, of 60 guineas to Messrs. Dixon, of Moxon, Barnsley; 2nd, 25 guineas to Messrs. Roper and Browning, Manchester. Mr. Evans (Evans and Jolly), Nottingham, was called in by the council to report and adjudicate on the plans.

CRIEFF NEW CHURCH.—A correspondence has appeared in the Dundee journals as to this competition. In 1878 the Kirk Session of Crieff advertised for designs for a new parish-church, and ultimately awarded the premium to one of the designs submitted by Mr. James M. McLaren, of King William-street, Strand, London, who subsequently produced estimates, showing that it could be carried out for the stipulated sum. The work has not been carried out, and Mr. McLaren asserts that this delay has arisen because a certain influential member whom he names has striven to get his brother-in-law, Mr. George Ewing, a local architect, appointed. To this letter Mr. Ewing has replied, stating that Mr. McLaren gained the premium by submitting a set of old plans, originally prepared in competition for a church at Arbroath, and that he had, therefore, been well paid for his trouble in receiving the first premium at Crieff. Mr. McLaren, in a further letter, admits that he sent in plans designed for a site at Arbroath, but says these were alternative only to a set specially prepared for the Crieff competition, and again complains of the obstructions raised by Mr. Ewing's relative.

ROCHDALE NEW BOARD-SCHOOL.—The competition for the proposed new board-school in Rochdale, on the Harelands estate, fronting Derby-street, was concluded last week. The School Board offered premiums for the best designs, for schools to accommodate 500 children at a cost not exceeding £10 per scholar. There were 38 competitive designs sent in, and from these the Board have selected two. The design which has secured the first premium, and which is to be adopted for the school, is that marked "Utility," and is by Messrs. Maugnall and Littlewood, of Manchester. The plan which has secured the second premium of £10 is by Messrs Holtom and Connon, of Dewsbury.

WOODFORD, ESSEX.—In a limited competition for a new church to be erected at Woodford, the design of Mr. James Fowler, F.R.I.B.A., and Mayor of Louth, has been selected. Mr. Ewan Christian was the referee who made the award.

Building Intelligence.

BRENTWOOD.—The memorial-stone of the parish-church of St. Thomas the Martyr was laid on Monday. The church is from the designs of Mr. E. C. Lee, F.R.I.B.A., President of the Architectural Association, and which were illustrated by a perspective in the BUILDING NEWS for July 25, 1879. It will replace, on the same site, a mean and inadequate brick edifice built in 1835; but the present chancel, which was rebuilt more recently from the designs of Mr. Joseph Clarke, F.S.A., will be retained. The new nave will be 19ft. wide, with north and south aisles, each 17ft. wide, and all 100ft. in length, and there is proposed to be a west tower, 19ft. square, finished with a spire. The nave will be 42ft. high, and will be divided into seven bays; 1,000 sittings will be provided. The design is Early English throughout. The west front will be treated in an unusual fashion, with an external gallery connecting twin staircases, and with angle turrets to north and south. The cost of the entire scheme is estimated at upwards of £8,000, but at present a contract has only been made for the first section of the work, the erection of new nave and its aisles; this contract has been taken at £4,000 by Mr. J. Brown, of Chelmsford. The works were commenced four months since.

HONITON.—The chancel of the parish-church of Honiton has been restored under the direction of Mr. Edward Ashworth, of Exeter, by Mr. Harry Hems, of the same town. The contract embraced much new work, and a careful overhauling of the triple roofs of the chancel and its aisles, a new east window, the restoration of stone arcades, the laying of encaustic tiles in the sanctuary and various avenues, the provision of carved oak stalls and other chancel fittings—but more particularly the restoration of the almost unrivalled old rood-screen and its two accompanying parcloses. In a line with the parcloses, and continuing it to the sanctuary, and right up to the eastern wall, are new screens in English oak. The floor-line of the chancel rises one step above the nave at its entrance, and another at the sanctuary. This latter is a broad one of Keinton stone, and upon it rests the altar rail, which is of moulded oak, raised upon wrought-iron standards, supplied by Messrs. Thomas, Brawn, and Co., of Birminghan. The floors of all the approaches of the whole space within the altar-rails are laid with encaustic tiles. Into these and with them are introduced, with capital effect, some of the old diagonal black and white marble flooring, and some interesting grave-stones of ancient date are also incorporated into the floors. During the progress of the works, Mr. Hems came across—concealed in the wall—the original doorway communicating from the north wall, just eastward of the screen, by a flight of steps up to the broad rood-loft above. This, under the superintendence of the architect, he opened out. The old moulded jambs are now shown, and a ledge door of seasoned oak, ornamented with wrought-iron work, has been put up.

IPSWICH.—The new church of St. Michael, Upper Orwell-street, Ipswich, was consecrated a fortnight since. The building, which will accommodate about 400, is Early English in style and built of red brick, with Portland stone dressings externally and with Bath stone-work internally. The western gable end faces Orwell-street, and is broken by a porch, the main entrance to the church, and by a west window, with tracery of late Early English character. The gable is surmounted by a double bell turret, with two bells, and is finished with a stone cross 64ft. above the pavement. The roof is covered with thin Broseley tiles, with terra cotta ridge. The dormers on each side are finished with cut barge boards and tiled terminals at the apex of the gables. At present the nave consists of five bays only, but the site will afford room for the extension of the church eastward, by adding two more bays to the nave, and a chancel. The church now consists of nave and north and south aisles, the nave being 26ft. 3in. clear between columns, 58ft. 6in. in length, and 43ft. high to apex of roof. The arches, which are of rubbed and gauged brickwork, with mouldings at the angles, spring from massive circular stone piers, with carved capitals semi-Norman in character. The walls are entirely of red brick, with a dado of chocolate-coloured tiles, above which runs a white stone band; and above the arches, and at the level of the spring of the arches, run bands of darker bricks; a moulded stone band is also carried round the church beneath the clerestory windows. The roof of the nave is specially constructed to reduce to a minimum the lateral thrust upon walls. It consists of T iron principals, and ribs bolted together and cased up with Memel timber. It is boarded with stout fir boarding, the whole being stained a light oak colour. It is broken up by two dormers on each side, in each of which are three lancets. The aisle roofs are lean-to, with moulded principals and plain rafters, and ceiled between the rafters. The windows of the aisles are lancets in pairs. The church is seated with benches of pitch-pine and white deal. The pulpit is oak in two colours, and stands upon a plain stone base. The communion-railing is of walnut with light oak standards; the space within it being paved with marble mosaic, laid by Italian workmen, the initials S.M. being worked in. The building is warmed by hot-water pipes. Mr. E. F. Bishopp, of Ipswich, was the architect, and Mr. R. Girling the contractor. The hot-water apparatus was fixed by Mr. Felgate. Mr. Ebner, of London, did the mosaic work, and Mr. Harpham, Ipswich, the stonework, the carving of the capitals of the piers, &c., being the work of Mr. Kinnell. The cost has been £3,000.

SOUTHWARK.—A new church in Pepper-street, Southwark-bridge-road, which has been in hand nearly two years, is completed as far as the first portion—the chancel—is concerned. Mr. G. G. Scott is the architect. The style is Early Pointed, and the materials red Chelmsford brick, with Bath stone dressings. The internal walls, where not of stone, are stuccoed and left a natural colour. The work has been carried out by separate contracts. Mr. Harry Hems, of Exeter, has executed the whole of the stonework; Mr. S. J. Scott, of Bell Alley, London-wall, E.C., has done the carpenter's work. The brickwork was carried out by workmen put on by Mr. Edward Deacon, of 4, Reddin's-road, Peckham, the clerk of works, and that gentleman, under Mr. G. Gilbert Scott's own immediate supervision, has superintended the whole works. The church is heated with Mr. Grundy's apparatus. The cost of the works up to the present time exceeds £10,000.

CHIPS.

At a meeting held at Lechlade, last week, it was resolved to restore the parish church in accordance with plans prepared by Mr. Waller, diocesan surveyor for Gloucester, and at an estimated cost of £1,800. The first section of the work will be the removal of the present high pews, and their replacement by open seats.

A reading-desk of oak on stone base was, last week, placed in Soham church, Cambs. It has been made by Mr. Tooley, of Bury St. Edmunds, from designs by Mr. J. Piers St. Aubyn, of London.

The chapel of H.M. Prison at Stafford has recently been fitted with some handsome brass standards and altar-rails. The work is that of Messrs. Jones and Willis, Temple-road, Birmingham.

The Local Government Board have granted powers to the Eastbourne Local Board to borrow £3,850 for the purpose of adapting Mr. Isaac Shone's pneumatic sewage system at Eastbourne.

In the forthcoming building exhibition at Islington over 35,000ft. of space has been already allotted.

A new church is about to be built at Redruth on a site given by Lord Clinton. It will have a school-room beneath it, and will be built in sections, of local stone. Mr. J. P. Seddon, of Queen Anne's-gate, Westminster, is the architect.

At the meeting of the Gateshead School Board, held on Wednesday week, the contract for the erection of the schools, to be commenced immediately, on a site adjoining Durham-road, was let to Mr. Alexander Thompson, for £3,728. The architects are Messrs. Oliver and Leeson, of Newcastle.

The relighting of the parish-church, Edengate, Tamworth, has recently been effected by means of the new patent Hesperus lamp, manufactured by Jones and Willis, Birmingham and London.

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[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

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RECEIVED.—M. Bros and Co.—S. B.—T. C.—T. H. C.—G. B. J.—F. K.—W. P.—T. and R. B.—E. C.—T. S.—D. and Co.—B. of H.

PERSPECTIVE. (There is no good book. A few lessons from a good man are what you want. Doubtless some of the artists who advertise in these columns would give them for a fair consideration.)—G. G. NEWMAN. (Your letter seems to us to deal with private matters beyond the cognisance of our readers, and if published would involve us in a succession of rejoinders and sur-rejoinders, for which we could not possibly spare space.)

"BUILDING NEWS" DESIGNING CLUB.

NIL DESPERANDUM No. 2. (For day-rooms, 20ft. floor space is a minimum, but for sick-wards 60ft. is not too much.)—REX. (We intended to have 8 beds in all. One accident-ward will be ample.)—A COMPETITOR. (The infectious ward should be isolated as much as possible from the other part. It would be certainly better as a separate room, or provision might be made for it as a temporary erection.)

Correspondence.

THE MANAGERS OF METROPOLITAN BUILDING.

To the Editor of the BUILDING NEWS.

SIR,—Mr. Walker, perhaps from not having at hand the article of which he writes in your last number, has in some cases mistaken its meaning; and in other cases brings forward as arguments against it what really appear to be no arguments at all.

1. It is not a fair account of the article in question merely to say that it "speaks disparagingly of the narrow capacity, culture, and ability of district surveyors." A more correct statement would be that it speaks so of *some* district surveyors. Its meaning, stated more precisely, is something like this: That if we could suppose a hundred of the highest and a hundred of the lowest names to be picked out by general consent from the roll of London architects, we might perhaps find half-a-dozen of each class among the district surveyors. Of course I am not supposing that the *status* of an architect is to be settled like that of a grocer, by the amount of his income.

2. The article does not insinuate that district surveyors in general "wink at the practices of speculative builders"; it only states that the system under which they work tends to make them do so. It, moreover, states expressly that this is not put forward as the usual result of the system. If I saw Mr. Walker standing on a flimsy scaffold, I might say, "That scaffold has a tendency to fall"; but this would be a very different thing from spreading a report that he had come to the ground and (*absit omen!*) seriously hurt himself. None the less for this, the fewer rotten scaffolds and the fewer rotten systems we have to do with, the better for us all.

I will next refer to some of Mr. Walker's arguments against reform.

1. As every surveyor has to make a monthly return of his fees to the Board of Works, and as these fees are on a fixed scale, Mr. Walker fails to see how malpractices about fees can arise. This is not at all surprising; but some out of the half dozen gentlemen at the bottom of the list perhaps could, if they would, enlighten him. What I, on the contrary, fail to see, is how these monthly returns and fixed scale can prove an effectual check to any man who really wants checking. Do the Board of Works examine every building with the minuteness which alone could detect ingenious peculations? If they do, that work alone is enough to keep them busy; if they do not, what real check is there? None, except a check against clumsiness and want of contrivance; none, except a check against doing the thing so stupidly that there shall be no defence if it chances to be found out. Suppose, for instance, a building, the principal story of which exceeds by a foot or two the height allowed for a certain thickness of wall. Suppose the surveyor objects to it, as he should, and demands the addition and piers. Suppose him at the same time to tell the builder, "This main building and these offices ought, in my opinion, to be looked on as three separate buildings, and my fees should be calculated accordingly"; and suppose that the builder, who knows well enough that the last claim could not be sustained for a moment if he contested it, should "split the difference," and give up the second point with the understanding that he should not be troubled about the first. Who is to find all this out? Do the Board of Works send round and measure the height of every wall to a foot? What invisible power, again, compels the surveyor to return the true amount of fees paid him in such a case? Or what is there on the face of the matter to show he has done wrong if he does return the true amount? The case is no imaginary one. I could take Mr. Walker to a building where the district surveyor objected for the reason named; mysteriously withdrew his objection, and withdrew it, the builder informed me next day, for the consideration assigned. The builder, no doubt, was as bad as the surveyor, but he had no motive for misleading me in the matter. I am not writing a "Manual of Building Acts Evasion," or I could give plenty of other contrivances which are found to work admirably in practice with the few surveyors who will stoop to them.

2. Mr. Walker says it is impossible to pay district surveyors by salary; that it would be unfair to tax the public for the purpose, and contrary to reason and all legal precedent. Why should it be more unfair to tax the public in order to insure the safety of public buildings than of public roads? The lives of the public are at stake in both cases. How, again, is it contrary to legal precedent? Inspectors of nuisances, I believe, are paid by a salary, and not by the number of nuisances they inspect. Why not inspectors of buildings also? No one, of course, wishes to do anything but what is absolutely just to the present occupants of district surveyorships. Let them, by all means, be put in as good a position as their present one, and if fees are retained, let builders pay them to the Board of Works direct, while the Board pays the surveyors a fixed and liberal stipend.

3. "It is absolutely false," Mr. Walker tells us, "that district surveyors try to make their districts preserves for private practice." Why so? "Because they are compelled by law to report every case where they are themselves so employed, and to get some other surveyor appointed to overlook them." A little milder denial, or a little stronger proof that the denial is correct, would, I think, have been an improvement here. What object could one district surveyor have in dealing out to another the same treatment which either of them might be tempted to deal out to an intruder? Daws do not peck out daws' eyes. There is a matter, too, which the non-professional world can judge of by experience, and every day people about to build will tell you, "I shall employ Mr. ———, the district surveyor; we all know it saves a lot of time and money."

4. The article I am defending, seeking only to deal with systems and practices, expressly guarded itself against criticism of recognisable individuals, either at the Board of Works or elsewhere. But it was not written without many years' experience of applications, appeals, correspondence, and no-respondence. The last may, for ought I know, be an institution peculiar to Spring-gardens, and hardly introduced yet into public offices; but its effect is to compel the inquirer to that personal attendance which unimportant people, like the present writer, generally feel it due to their self-respect to avoid. On the question of appeals, we have only to remember that district surveyors are the persons appealed against, and that Mr. Walker is himself a district surveyor, in order to draw valuable inferences from his satisfaction with the existing mode of conducting them.—I am, &c.,

THE WRITER OF THE ARTICLE.

MODERN DOMESTIC ARCHITECTURE.

SIR,—In your issue of last week, Mr. Phipson asks "where has 'Delta' been looking if he cannot see that, for the last three hundred years, and until quite lately, we and other European nations, have been doing little else than 'endeavouring to revive Greek art'"? Since I have not seen as Mr. Phipson has, I shall be obliged if he will mention any building in Great Britain three hundred years old, and in which there appears this endeavouring. I should like much to see it, because "the outcome of this three hundred years' effort is the eternally reiterated Corinthian capitals and Classic mouldings which line miles of streets in Belgravia, Kensington, and compose the whole of such wearisomely ugly cities—even if only for their very monotony—as Glasgow and Berlin"; an outcome that, after after no less than three centuries of endeavour, is certainly somewhat surprising. Wheresoever I may not have been looking, I am so intimately acquainted with at least Glasgow, that I can say if it be "ugly" and "monotonous," it is certainly not *because* of its examples of Greek architecture. On the contrary, much of its Greek architecture is of the greatest excellence, the "outcome" of rare creative genius and the highest culture—an architecture that I suspect might relieve the "monotony" which likely enough characterises the "Greek" (?) of Belgravia and Kensington.

It is thus that Mr. Phipson himself characterises the Greek:—"As a matter of fact, the Greek style is one of the most rudimentary and unscientific—its beauty, arising merely from the good taste shown in the working out of its simple construction." I would like to ask him "where," or *how*, "has he been looking," if he can see nothing but the "rudimentary" in its unrivalled proportion and symmetry; in its exquisite detail; in its tender shade, and deep, yet soft shadow; in the entasis of the column; in (in some instances) the inclination of the axis; or in the curvature of the great base-steps of the Parthenon; if he can see no other beauty than that arising merely from the good taste shown in the working out, in the composition of the High School, Edinburgh, or in the detail of the finial of Burns' monument at Alloway?

I do not ask anyone "to throw away all the æsthetic experience we have gained from the last 2,000 years," although it has no more given to this century a greater sculptor than Phidias, or a greater epic poet than Homer, than have 300 years of "endeavouring to revive," given as their "outcome" *Greek* art. There are some things which "age shall not wither, nor shall custom stale," which "the world will not willingly let die."—I am, &c., DELTA.

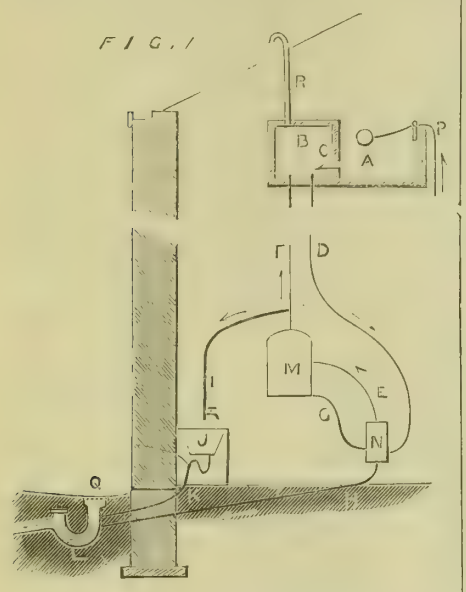
FROZEN WATER-SUPPLY PIPES AND KITCHEN-BOILER EXPLOSIONS.

SIR,—In many cases a little extra attention, thought, and expense, *while the fittings are being put in*, would often prevent annoyance from pipes, &c., freezing and bursting, and so save considerable expense afterwards. In one house I have in my mind no provision was made to empty the kitchen boiler. The house has been shut up all the winter until a few days ago,

when, upon letting the water on, it was found that the hot-water cylinder and the boiler, lately supplied, were both frozen up and had burst. Mending this will cost about twenty times as much as the putting in of a scour-cock and pipe at the proper time. The plumber's advice in the summer time, to provide against frost, is often scouted as a mere attempt to get extra work.

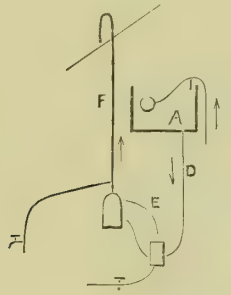
In the following drawing, Fig. 1, an *extra-*

FIG. 1



safety plan of fitting in the hot-water pipes is shown which, especially with a little attention, will not only help to give greater safety against the kitchen-boiler exploding, but will also help to prevent the cold-water supply-pipe from freezing. The improvement here (in addition to wrapping the pipes with felt) is to supply the kitchen-boiler from the small hot-water cistern B, in place of from the cold cistern A, as shown

FIG. 2.



in Fig. 2, and which is generally done. M is the hot-water cylinder, with expansion-pipe F leading up into the hot cistern, and which may have a hinged valve upon its top. All draw-off cocks are to be taken from this expansion-pipe, so that the cylinder M may not be able to be emptied by any of them. It is a bad plan to branch any crane off either of the circulating-pipes, E or G. I is the hot-water supply to the sink J, and K the waste-pipe of the sink. L is a disconnecting or grease trap outside of the house and joined to the drain. H is the scour-pipe of the kitchen-boiler N, with a stop-cock upon it. Now, in the time of frost, if the hot-water crane at the sink at J is left constantly trickling a little, it will keep up a movement of the water in the supply-pipe P, and prevent it freezing up so readily, while all the pipes, D, E, F, G, and I being warm, they cannot freeze. The waste-pipe of sink K being under the ground will hardly freeze either in this case, especially if the grating at Q be covered over while the frost lasts. In this case case, too, it may easily be seen if the pipes D and F are all clear by either blowing into or pouring water down the pipe D, and seeing the effect produced at the top of the pipe F. C is the pipe connecting the two halves of the cistern with a hinged valve at the hot end. With this Fig. 1 plan the fire in kitchen may be kept on without danger, even when the water-supply by the pipe P is temporarily stopped, so being that water is poured by hand into the cistern B, and not drawn off; so long as the cylinder M is full of water, and the expansion-pipe F clear, the fittings are safe, and especially if water poured into the top of the pipe D rises up through the pipe F. As an extra precaution, a safety-valve might be put on upon the cylinder M. It would be useless, however, if the fire had been off and the pipes E and G frozen. In this case the valve would be safer were it fixed to the boiler, but this is easier done with exposed boilers than with close ones.

In closing, I may recall a precaution regarding supply and outlet pipes of boiler and tank M, mentioned at page 208 of this journal for February 21st, 1873, inattention to which is possibly the cause of some of the late boiler explosions, viz., that there should be no "bagging" in any part of course, but—and especially in the expansion-pipe—a rise upwards in every part of the route.—I am, &c.

W. P. Buchan, S.E.

EXTERNAL-SOIL PIPES.

Sir,—I am sorry to find that Mr. Buchan's reply does not afford a sufficient explanation of the special objection which he makes to soil-pipes fixed inside the house, that "they generate and give out into the air more bad gas than those fixed externally."

The probability of leakage into the house is not under discussion, and I do not pretend to express an opinion as to whether, upon the whole, such pipes are better fixed inside or outside. There is at present a very great diversity of opinion upon the subject, and I have only professed to give certain facts which have come under my own notice as to what I myself and others have done.

But Mr. Buchan's illustration of the privy is nothing to the point. A properly ventilated soil-pipe cannot be in any way compared with a stagnant cesspool; it is simply misleading so to invite the comparison and, if I find, as I do in fact, a free constant upward current through my soil-pipe, I may safely conclude that any decomposition of the accretions on its inside will be reduced to a minimum.

Surely some further explanation is needed to account for his startling fact that an increased rapidity of air-current through a soil-pipe favours decomposition rather than oxidation. I did not assume, nor could I suppose, that there would be in a stoneware, or even a metal pipe, fixed inside the house, any such heat as to favour decomposition, but only that amount of difference between the temperature within the pipe and that of the outside air, which would create a current otherwise neutralised by the chilling of the pipe if subjected to exposure.

Mr. Buchan is usually so correct in his views and accurate in his explanations, that I can only suppose him to be under some misapprehension as to what it was I endeavoured to point out.—I am, &c., William White, F.S.A.

Sir,—In reply to "A. C. G.," I would inform him that I have found the open grid-traps, such as Stiff's, Stridder's, &c., &c., may be kept from freezing up by the old-fashioned remedy of pouring down a little strong salt-and-water from time to time.

I dare say the same might be tried with a lead soil-pipe, but I have not had occasion for it. My experience of outside soil-pipes does not show me that they are liable to freeze up; they are not supposed to be ever *filled* with water, like a supply-pipe.

While with my pen in hand, may I ask some sanitary reformer kindly to point out for our benefit, what are the real structural defects of the *Bell-trap* and D trap, and in what precise point they are in fault? I never find that anyone has ought to say further than that they are *obsolete*; but there must surely be a more satisfactory way of defining the matter.

Some twenty-six years ago I was taken over premises in Liverpool by one of the sanitary inspectors, and shown the amendments just carried out, viz., three bell-traps in sinks, and one large gulley outside bell-trap; and these were indicated to me as illustrating a valuable sanitary lesson, that I was then too young to call in question, although I did not see it at the time. I have lived to see such things denounced, like many other so-called sanitary contrivances; but surely the laws of science are unvarying and not subject to changes of fashion.—I am, &c., B.

BURTON-ON-TRENT MARKET-HALL COMPETITION.

Sir,—Referring to the notice in last week's Building News as to the alteration in the award of premiums in this competition, I shall be obliged if you will allow me to state what the proof, which I submitted to the Council, consisted of; in order that the profession and the public may judge whether I have been treated fairly or unfairly in this matter.

When first asked to show that the building could be erected for the stipulated amount, I made calculations such as are usual, and informed the Markets and Fairs Committee that I was satisfied that the hall could be built within the sum named. This not being considered satisfactory by the committee, I took out detailed quantities for the work, forwarded a copy of the bill of quantities to the committee, and with it inclosed a tender from one of the largest contractors in Birmingham, offering to execute and complete the whole of the work in accordance with my plans, for the sum of £8,250.

This the committee, acting I am informed (though it is difficult to believe), on professional advice, deem "insufficient and unsatisfactory" and decline to inform me what further proof they require, or could possibly have.—I am, &c.,

The Owner of Plan No. 8.

Birmingham, Feb. 16.

FIGURES IN GLOUCESTER CATHEDRAL.

Sir,—A correspondent kindly draws attention to a clerical error I fell into in a recent issue, by referring to the late talented sculptor of the above as Mr. W. Redfearn, instead of Mr. J. H. Redfern. But the most remarkable thing seems to be that any ordinarily informed person should have doubted the existence of Mr. Redfern's renowned sculpture in the Gloucester Cathedral reredos at all! There does appear, however, reason for some little uncertainty as to what particular stone the sculptor selected for his work. Mr. John Hunt, the courteous sub-sacrist of that cathedral, was my authority for quoting it as from the Cooper's Hill quarries. The other day, Mrs. Esther Tuffley, of Nailsworth, expressed to me her strong belief that the stone in question was from *her* quarry at Ballsgreen, near Nailsworth. Again, on turning to a contemporary (*Builder*, Feb. 22, 1873), I find it therein stated that Redfern's groups and figures are wrought in stone from Mr. Wingate's quarry on Crickley Hill.

These various statements go to show that it is not altogether clear what particular sort of Painswick stone was used. There is no uncertainty, however, about the power and the ability that every line of Mr. Redfern's sculpture displays. His early death is the more to be lamented, when we realise to the full—now that he has gone—how few men are left behind him worthy to take his place.—I am, &c., Harry Hems.

SHEFFIELD PARISH-CHURCH FONT.

Sir,—With regard to Mr. Drury's letter in your last issue, I deem it necessary, as I was the cause of this correspondence, that I should give some explanation of my dissatisfaction.

As I stated in my first letter, my drawings were returned, carriage paid, but no "letter of thanks with the names of the successful competitors" accompanied them. This it would seem was simply an oversight; but as no announcement of any kind appeared in the professional journals, I naturally expected that if all competitors were treated in the same manner there would be general dissatisfaction. To extract information on the subject was therefore the cause of my procedure; but as Mr. Drury has now intimated the names of the successful competitors, and given a satisfactory statement, there remains nothing more to be said.—I am, &c., A Last Resource.

SEWER VENTILATION.

Sir,—I see the question of inside or outside soil-pipes is being discussed in your paper. I am certainly in favour of inside pipes, taken up through the roof and ventilated there, for several important reasons.

Firstly. The warmth of the house facilitates the action of the ventilating pipe.

Secondly. The pipe is protected from frost, but it should always be so placed as to render easy inspection at any time.

Thirdly. You avoid the necessity and risk of passing your closet junctions through the outer-wall to connect them.

Beyond this, I think my report* will explain itself, as I have endeavoured to make it as clear as possible to non-professional readers—such as are usually met with in town councils.—I am, &c.,

R. Read,

Assoc. Memb. Inst. C.E., City Surveyor.

* Epitomised on p. 193, under the title of "The Ventilation of Sewers."

"THE CAPABILITIES OF RENAISSANCE."

SIR,—I see that in his paper on this subject read in Edinburgh, Mr. Dewar—it may be from some escape of memory—has unfortunately confounded the works of two great architects. He is speaking of the architecture of Glasgow, and after paying a tribute to the genius of "Greek" Thomson, no less happily expressed than it is deserved, he instances "that masterpiece, St. George's church and spire," as one of his chief works. St. George's spire, a composition of singular originality and beauty, is in every respect a masterpiece, but it is the work, not of J. Thomson, but, as are several other great works in Glasgow, of Mr. Stark, of Edinburgh. The church to which Mr. Dewar refers, when he says that in it "'Greek Thomson' has erected what a man of genius only could have accomplished, a building fitted to rank beside the greatest works of ancient Greece," is, in all probability, the United Presbyterian Church in St. Vincent-street, a building of great grandeur of composition and unrivalled beauty of detail.

If I mistake not, there was not long ago, by another critic than Mr. Dewar, another work in Glasgow ascribed to Mr. Thomson which was not his. Thomson's work is not only so unique, but by careful observers is so unlikely to be confounded with that of his imitators, that it seems surprising such mistakes could possibly be made.—I am, &c.,

T. G.

DOMESTIC BUILDINGS ON PIERS AND ARCHES.

SIR,—It has on many occasions suggested itself to me, especially so after the heavy fall of snow, why the architects of the present day should not have advocated the erection of domestic buildings on piers and arches, so that the underside of the usual living-floor would be some two or three feet above the level of the ground line, so that a free current of pure air would entirely surround the building.

Why we should cling to the Ancient British idea of burying ourselves some few feet below mother-earth I cannot understand, and by so doing lay ourselves open to sundry diseases and serious consequences; but were the idea carried out, there would be no need of the many patent damp-courses; neither should we experience rotten floors and woodwork. Besides, the whole of the pipes which underlie the building would be at once accessible should there be an escape or leakage, and the unpleasant disturbance of floors from such a cause would be done away with.

Taking this idea on the first principle, that of health, it must be obvious to all that it needs consideration, and the additional height in the buildings would not be a very heavy item to the cost.

I believe Dr. Richardson's "City of Health" was to be built on this principle, but in a far more expensive manner. I hope some day to see this idea embodied in local by-laws where it is practicable in buildings.—I am, &c.

FREDK. W. HYDE.

LIVERPOOL SCHOOL OF ART.

SIR,—I read with much pleasure the two letters in last week's BUILDING NEWS, and endorse every statement therein. Mere writing, however, by individual competitors will avail us nothing, whilst, by unity of action, we might teach the gentlemen concerned such a lesson as would impress itself upon them and the public generally in such a way as to prevent the recurrence of such barefaced scandals.

What I suggest is, that each of the 80 competitors subscribe towards a common fund for the purpose of bringing the case before a jury of disinterested men, so as to see whether any committee can advertise for plans on specific terms, and set same at naught after putting architects to considerable loss of time and money. I shall be glad to subscribe £5 to such a fund, and should be glad if my brother competitors would communicate to you their names and subscriptions, when the necessary arrangements can be made for an early trial.—I am, &c.,

A COMPETITOR.

[We have received several other letters having reference to this competition, for which we cannot spare space. "Another Competitor" offers half a guinea towards the fund.—ED. B. N.]

The town-council of Birmingham on Tuesday instructed Messrs. Martin and Chamberlain to prepare plans for public baths in Monument-road, estimated to cost in execution £22,000.

The new church of St. Paul, Bournemouth, was consecrated on Tuesday by the Bishop of Winchester. It is Early English in character, and has been built from the plans and designs of Mr. A. H. Parken.

A stained-glass window is about to be placed in the north transept of Holy Trinity Church, Twickenham; it is supplied by the Gateshead Stained Glass Company, Newcastle-on-Tyne.

Intercommunication.

QUESTIONS.

[6395.]—**Oak Paling.**—Will some reader kindly say what is the best means of preserving a Riga oak paling, all wrought and exposed to the weather and smoke of a town? I should prefer to retain the grain of the wood.—X.

[6396.]—**Bell-Turret.**—I am at present engaged in designing a bell-turret, supported on four turned oak standards, and I should be obliged if any of your readers would kindly assist me to find the smallest section of the said standards at any point. The turret is a square pyramid, 10ft. high from eaves to finial, and 3ft. square at base, and the supporting standards 5ft. high. Do not take the weight of turret into consideration, but only regard wind-pressure and scantling of oak standards.—BELL-COTE.

[6397.]—**Area Walls.**—Under an ordinary lease of a dwelling-house landlord has to keep main walls and timbers in repair, and, amongst other obligations, tenant has to keep the boundary walls in repair (there being a considerable extent of garden and yard). Recent frosts have seriously damaged the area walls round house. These areas are wide and open, thus the wall is a kind of retaining one to keep up the soil behind it. Whose duty is it to repair these walls, involving in part their being rebuilt? Landlord denies his responsibility, alleging they are boundary walls.—ENQUIRER.

[6398.]—**Workhouse Plans.**—The guardians of the —— Union advertised the following in our local paper:—"To Architects and Contractors. —— Union. New School-House. The Guardians of the above Union invite plans, specifications, and estimate of a proposed new school-house and tramp-wards at the workhouse on or before the 31st day of January. For further particulars apply to Clerk of the Guardians." In answer to the above, three plans, &c., were sent in. The guardians chose one of them, which was sent to the Local Government Board for approval, but was returned to be altered. In fact, they were so altered that they were nothing like the original, and the tramp-wards were altered that they are now almost identical with the plans sent in by me, and not according to the original plan sent in by the successful architect. Will you or any of your correspondents tell me whether I have any claim on the guardians for my plans, &c., taking into consideration the wording of the advertisement, and, if any, what would be a fair charge?—FAIRPLAY.

[6399.]—**Filtration.**—I should like to know the best work on filtration of potable water.—ENQUIRER.

[6400.]—**Staining Pitch-Pine Green.**—Will some kind correspondent inform me the ingredients, and how to apply them, in order to tint pitch-pine a clear pale green?—B. J. M.

[6401.]—**Modulus of Rupture.**—I read in Rankine "the modulus of rupture is 18 times the load that will break a bar 1in. square, supported at two points 12in. apart." Will somebody be kind enough to explain this for me? I want to know why it is taken as 18 times the breaking weight?—M. I.

[6402.]—**Quantity of Stone in Spire.**—In taking off quantities, which is the customary method of obtaining the cubical contents of stone in a spire—to get the net quantity only or take for each stone the smallest rectangular block out of which it can be cut? I presume the latter, so as to allow for the waste, which would be consirable, but I should like the opinion of someone with more experience than—NOVICE.

[6403.]—**Builders' Accounts**—In billing extras and deductions, is it better to subtract the smaller from the larger items of the same description in the abstract? For instance, 70 superficial yards of plastering as intended from 90 as executed, in consequence of alterations, simply carrying the difference of the two amounts or 20 yards to the bill of extras, or show 90 yards in the column of extras and 70 yards in that of deductions.—X.

[6404.]—**Sanitary Engineering.**—In Baldwin Latham's work, page 45, it is stated that in the case of a 2ft. barrel sewer running 3in. deep, with a fall of 1 in 550, or a velocity of 1·6ft. per second, it will require a drop in the invert of 6·29ft. for the water to pass over an opening 1ft. wide. With a velocity of 2·25ft. per second the drop should be 3·25ft., and with a velocity of 3ft. per second the drop should be 1·7ft. Will some of your readers kindly explain how the "drop" is arrived at?—A. N.

REPLIES.

[6371.]—**Stone Work.**—You cannot legally demand payment for the extra quantity of stone used, unless an order was given for the same by the architect after the contract was taken, in which case you could show evidence of the extra quantity used. Extra work or material to be paid for ought to be granted only under the order of the architect in writing. "Yorkshire" had better make arrangements to have his work measured if the architect is willing to adopt this mode of adjustment.—G. H. G.

[6372]—**Architects' Charges.**—"Juvenile" can charge on the total cost of building, including extras ordered, over the £500.—G. H. G.

[6373.]—**School Plans.**—Each class-room is, doubtless, intended for 40 boys. It is recommended that the number in class-rooms and the school-room should be equal. An area of 13ft. 6in. to each pupil is sufficient. The principal school-room should be large enough to allow 80ft. (cubic) space per child, and this is the allowance made by the School Board for London.—G. H. G.

[6390.]—**Whatman's Paper.**—Owing, doubtless, to damp. Six years is too long to keep drawing-paper. It may possibly have been badly sized at first. Sponge well with alum water when straining the paper, though this will not always answer if the spotting has gone too far.—B.

[6392.]—**Pipe-Jointing.**—I am of opinion the external cement jointing is better avoided on clay, as the former shrinks or cracks and makes the joint useless. Concrete is a good material for jointing, and when there is any risk of settlement the pipes are best laid in concrete. A great deal depends on bedding the joints of pipes evenly, for the slightest settlement disturbs the joint. The sockets especially should be free from pressure. I should prefer for wet subsoils an asphalte-joint, the trench being lined with clay puddle.—G. H. G.

[6394.]—**Entasis of Greek Column.**—Information on this subject will be found in Tarn's "Practical Geometry" (Lockwood and Co.), pp. 82, 95, and 101.—ARCHITECT.

WATER SUPPLY AND SANITARY MATTERS.

THE VENTILATION OF SEWERS.—The Corporation of Gloucester have received a report on the ventilation of sewers from the city surveyor, Mr. R. Read, A.M.I.C.E. It seems that in 1875-7, the outlying districts of the City were resewered, from the plans of Mr. Mansergh, C.E, who provided street ventilators throughout at about 60 yards interval. The smells from these ventilators soon occasioned complaint, and, contrary to Mr. Mansergh's advice and that of the Local Government Board inspectors, charcoal buckets were placed on the ventilators, but as their effect was simply to block the openings, they were removed after nine months' trial. Mr. Read says he has since opened ventilators in all the old city sewers, and though the smell at first was rather intense in the summer-time, it has gradually diminished, and the deaths from miasmatic diseases have decreased from 149 in 1877 to 120 in 1878, and 60 in 1879, an improvement which he attributes partly to the free ventilation and partly to the extension of the city water supply. Experience has shown that there are still a large number of old unventilated sewers in the outlying districts recently added to the city; and, as ventilation would be difficult, costly, and likely to lead to opposition from private owners, and withal ineffective unless supplemented by flushing from the street mains, Mr. Read recommends the corporation to do away with all old sewers at the backs of the houses, and to connect every house with the new system in the street front. This process has been gradually going on since the new sewers were laid, but it needs acceleration, and this can be done in either of two ways under the Public Health Act of 1875: 1st, by compelling each owner to connect his house with the new sewers at his own expense; or 2nd, by raising money on loan for the corporation to carry out the work themselves. If these old sewers are abandoned and disconnected, Mr. Read believes that the Gloucester sewers will be as perfect as any now in existence, and very little, if any, smell will arise from the ventilators that cannot be got rid of by flushing; at the same time he observes that the principle of the ventilation of sewers has never yet been carried to its logical conclusion, or applied in such a manner as to effect its undoubted purpose, viz., that of producing and ensuring a continuous draught of air of such a strength as to render it practically independent of the atmospheric changes, to which the feeble respiratory action of the present system of ventilation is so extremely susceptible. This can only be done by treating the house-drains in combination with the public sewers as one complete system, and the attempts hitherto made to separate them are, he asserts, based upon a fundamental error, the result of unreasoning panic amongst householders, divided authority, and independent action amongst sanitary engineers, architects, builders, and medical men.

THE DISPOSAL OF REFUSE.—A report on the disposal of house and street refuse has been presented to the vestry of St. Pancras by a special dusting and slopping committee. The members state that they visited Manchester, Salford, Rochdale, Bury, Warrington, and Leeds, all towns in which the contents of privies or middens have to be disposed of, and in all cases they found adopted some mode of destruction by fire in furnaces. The sorting was generally done by machinery, and the primary object of the operation was to find fuel for the working of machinery for manure making. The Manchester dust depot is described as a general municipal manufactory, where many descriptions of skilled labour and mechanical contrivances are in operation, which seem to have brought the Manchester corporation into competition with the ratepayers, by carrying on the trades of machinists, carpenters, builders, wheelwrights, tinmen, brushmakers, &c. This development the committee deem a very questionable policy for a public authority to adopt, and admirable as the system undoubtedly is for Manchester, where the pail-closet system is in operation, it does not appear to the committee suitable for London. At Leeds and Warrington, all the ordinary house refuse is consumed except the human excreta, which is sold without any mixture, to farmers. While there was some doubt as to the best form of furnace and mode of burning, the committee considered that destruction by burning was, both from sanitary and

economical points of view, the system most applicable to London. The disposal of residuum might be left for future consideration. Having shown the undesirability of attempting to establish one central depot for the whole district, and urged that the efficient collection of dust is of scarcely secondary importance to the disposal of refuse, the committee concluded by recommending :—

1st. The vestry should decide whether the collection of dust should be in the hands of the vestry, or the contractors, and your committee are of opinion that the collection should be in the hands of the vestry.

2nd. Whether this is decided in the affirmative or the negative, your committee should be authorised to prepare draft regulations for collection for the consideration of the vestry.

3rd. That if the contract system is to be continued, your committee should report on the modifications which are required in the present form of contract.

4th. That whether the vestry decide upon doing their own work as dust collectors or not, the refuse be partly or wholly burned, and, therefore, your committee should be instructed to seek for a site, for works, and that the vestry should offer a premium of £50 for the best scheme of disposing of refuse by fire, accompanied by plans and other details.

LEGAL INTELLIGENCE.

ARCHITECTS' CRITICISM ON ARCHITECTS.—The adjourned inquest on Timothy O'Leary, a labourer, who was killed by the fall of a rubble wall at the new Public Hall, Devonport, was resumed on Tuesday. In our previous report, in our issue for January 28 (page 114), it was mentioned that Mr. Hine, architect, of Plymouth, expressed the opinion that there was an error of judgment in the erection in rubb e-work of so thick an unbuttressed wall as that which fell, and that insufficient time was allowed for consolidation ; Mr. Samuel Knight, of Cornhill, London, E.C., the architect of the building, asked for an adjournment to produce professional evidence as to the design. At the adjourned inquest, Mr. E. A. Gruning, F.R.I.B.A., of Gresham-house, E.C., deposed that he was appointed assessor on the competition designed for the public hall, and as such selected for adoption the plans of Mr. Knight, who was then a stranger to him. He had examined the contract-drawings, and found the thicknesses of walls greater than would be required by the Metropolitan Building Act. He had seen the wall which had fallen, and considered the work very well executed, the mortar being equal to cement. He believed the wall, if built again under more favourable circumstances, would stand. The work was carried up too rapidly in wet weather, and he thought the wall fell forward because of a combination of damp mortar, the face of the wall being heavier than the backing, and the depth of indentations in the face of the piers below the cornice. In his opinion, there was no error in judgment in the design of the wall, or of conduct in the superintendence of the building. Mr. Hine called attention to clause 6 in part 2 of the first schedule in the Metropolitan Building Act, which provided that where the thickness of a wall was less than one-fourteenth of its height, the thickness should be increased in that proportion. Witness said he had given attention to the clause, but he denied that it was intended for this class of work, or that the work put into the wall in question required it. Mr. John Watson, architect, of Torquay, had had extensive practice in rubble masonry construction, and could see no error in the design of the public hall, and no inherent weakness. The wall ought not to have been carried to so great a height in wet weather without a cessation to allow the mortar time to dry. Mr. Arthur Cates, of London, Crown Surveyor of H.M. Woods and Forests, reported that the walls were, in his opinion, sufficient for the purpose, and that if slowly built and protected from soakage they would be stable. Mr. T. Roger Smith, district surveyor of Southwark and part of Lambeth, reported, "Had these plans been brought before me officially, as those of a rubble building to be erected in my district, I should have considered the thickness of the walls and the general distribution of piers and openings as satisfying the requirements." Mr. G. B. Williams, also a district surveyor under the Metropolitan Build ng Act, said: "The contract drawings are properly and carefully designed, and if carried out with care and without undue haste the work would have stood properly." The Coroner expressed the opinion that the fall of the wall was a pure accident, over which none of the parties interested had any control. It seemed that the accident was to be attributed to the indentations, combined with the excessive wet weather, which prevented the motar from setting. The clerk of the works might have been a little too sanguine and a little over-anxious to get on with the work, and proceeded with the work perhaps a little fast in the wet weather. But the accident was attributable not merely to one cause, but to a combination of causes. The jury returned a verdict of accidental death, and exonerated all concerned from blame.

Our Office Table.

THE Metropolitan Board of Works and the Corporation of London are at issue as to the much-debated Bill projected by the Great Eastern Railway Company with respect to Epping Forest. The latter have given the Company their support; the former, on the other hand, decided last Friday by 20 to 11 to petition Parliament against the Bill for making a railway from Chingford to High Beech, and against taking any part of the Forest for the proposed extension. The Corporation has been at fault. It saved a beautiful spot which was fast being nibbled away, and now its Council as the Conservators of the Forest have already forgotten their duty, and require to be taught it by the Metropolitan Board of Works.

THE Chief Commissioner of Works and the authorities of the City of London have, we hear, been unable to bring about an arrangement for the removal of Temple Bar obstruction. Unless some satisfactory arrangement can be come to, it is understood that provisions will be made to abolish the exceptional powers at present possessed by the City authorities, enabling them to erect such memorials in public thoroughfares, independent of supervision, and to place the area under their jurisdiction in exactly the same position as other parts of the metropolis, in which the consent of the First Commissioner of Works requires to be obtained before any statue or memorial can be erected.

A SCHOLARSHIP, or rather travelling studentship, for the exclusive object of furthering the study of purely decorative painting has thus far been wanting, and it is no doubt singular that this should have been the case while so many studentships in connection with painting and architectural art have from time to time been founded. The "Painters' Company" have, however, now offered the "Mence Smith Travelling Studentship" of forty pounds, to be increased under certain conditions to fifty pounds, for competition among the students of the West London School of Art, and the particulars of the scholarship were announced to the students on Monday evening last, at a meeting held for the purpose, by Mr. John S. Rawle, the head master. The conditions, which we need not here enumerate, are of the most desirable kind, and the competition cannot fail to attract many able competitors. The first competition will take place in February, 1882. The successful competitor will be required to spend at least two months abroad, and will be required to make sketches and notes of works of coloured decoration, which will be submitted to the committee on his return. Should the student elect to visit Paris, or such parts of the Continent on this side the Alps as may be arranged, £40 will be the entire payment, but £50 will be given if Italy be visited. We commend the studentship to those for whom it is intended.

THERE are serious objections to be urged against many of the new schemes for tramways in various parts of London. One of the greatest is the stoppage of and interference with traffic in narrow roadways, to the great annoyance of passengers and to the injury of the trade of those who have shops along the route. A more lasting disadvantage is occasioned by the tram-lines taking up the best part of the roadway, and causing greater wear by the cutting up of the surface. It is no wonder that strong opposition to projects of this kind has come from many of the vestries of late by the attempt to lay tramways in very narrow thoroughfares, thereby subjecting shopkeepers to inconvenience, and the margins of the roadways to constant repair and repaving. We happen to known of one part in the route of one of the South London Tramway lines, where the residents have been subjected to a repetition of this grievance, amounting in each case to an obstruction of all traffic, vehicular and pedestrian. If tramways are public conveniences, and we are inclined to think they are, the companies would be serving their objects better by contenting themselves with the wider thoroughfares.

IN consequence of the strictures recently passed in the Dublin newspapers on the decaying condition into which St. Patrick's Cathedral in that city has been allowed to fall (see p. 167 of our last issue), a special meeting of the cathedral board was held on Monday, under the presidency of the Dean, "to consider the ravages which ground-damp has made in the fabric of the cathedral." Mr. Boyle, C.E., reported that he had had the levels of the River Poddle specially taken that morning, and found it to be only 2ft. 7in. below the level of the floor of the cathedral. He was, therefore, certain that there was a large lodgment of water under the cathedral floor, which could not be drained into the Poddle at its present level. A letter was read from Mr. J. J. Fuller, architect to the cathedral, in which he strongly recommended that the most urgent thing to be done was the cleansing and deepening of the watercourse of the Poddle, a river which had often flooded the cathedral, and that accomplished, the floor should be re-set in waterproof concrete, and the decayed stone in the bases of the pillars cut out and replaced. It was resolved to form a special committee, and to inaugurate a fund for the purpose of carrying out the recommendations.

Throat Irritation.—Soreness and dryness, tickling and irritation, inducing cough and affecting the voice. For these symptoms use Epps's Glycerine Jujubes. Glycerine, in these agreeable confections, being in proximity to the glands at the moment they are excited by the act of sucking, becomes actively healing. Sold only in boxes, 7½d. and 1s. 1½d., labelled "JAMES EPPS and Co., Homœopathic Chemists, London." A letter received: "Gentlemen,—It may, perhaps, interest you to know that, after an extended trial, I have found your glycerine Jujubes of considerable benefit (with or without medical treatment) in almost all forms of throat disease. They soften and clear the voice. In no case can they do any harm.—Yours faithfully, GORDON HOLMES, L.R.C.P.E., Senior Physician to the Mu Throatclip eat and Ear Infirmary."

CHIPS.

Plans prepared by Mr. Arthur Baker for the enlargement and improvement of the Rhyl town hall were approved and adopted by the improvement commissioners of that watering-place last week.

The Manager of the Glamorganshire Banking Company of Swansea, whose new premises we illustrated on December 17 last, wishes to state the company is an unlimited one, and not limited, as was stated in our illustration.

The tower of the parish-church of Springfield, next Chelmsford, a structure built early in the 12th century, having shown symptoms of failure, is about to be restored from the plans and designs of Mr. Joseph Clarke, F.S.A., the diocesan architect for St. Alban's.

Lamplough's Pyretic Saline is refreshing, most agreeable, and the preventive of FEVERS, BILIOUSNESS, SMALL POX, SKIN DISEASES, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill. *Ure no substitute.*—[ADVT.]

Holloway's Ointment is not only fitted for healing sores, wounds, and relieving external ailments, but rubbed upon the abdomen it acts as a derivative, and thus displays the utmost salutary influence over stomachic disorders, derangements of the liver, irregularities of the bowels, and other intestine inconveniences which mar man's comfort.—[ADVT.]

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—London Institution. "Art Among the Ancient Greeks." By J. E. Hodgson, R.A. 5 p.m.
Royal Academy. Lectures on Architecture by Professor G. E. Street, R.A. No. III. "The Development of Styles." 8 p.m.
Institution of Surveyors. "Ecclesiastical Dilapidations." By G. R. Crickmay, of Weymouth. 8 p.m.

TUESDAY.—Institution of Civil Engineers. "The Weight and the Limiting Dimensions of Girder Bridges." By Max am Ende, A.M.I.C.E. 8 p.m.

THURSDAY.—London Institution. "One Aspect of Colours." By Captain W. de W. Abney, F.R.S. 7 p.m.
Royal Academy. Lectures on Architecture by Professor Street, R.A. No. IV. "Thirteenth Century Architecture—Italy." 8 p.m.
Society for the Fine Arts. "Book Decoration." By J. W. Bradley. 8 p.m.

FRIDAY.—Institution of Civil Engineers. "Sewer Work." By R. H. Thorpe, Stud.Inst.C.E. 7 p.m.
Royal Institution. "Excitability in Animals and Plants." By Dr. J. S. Burdon-Sanderson, F.R.S. 9 p.m.

CINDER-SIFTING ASH CLOSETS
Superior to Earth Closets. For Gentlemen's Houses, Cottages, Schools, &c.
NO DRIED EARTH REQUIRED.
The Sanitary Appliance Co. (Ltd.), Salford.

Doulting Freestone and Ham Hill Stone of best quality. Prices, delivered at any part of the United Kingdom, given on application to
CHARLES TRASK,
Norton-sub-Hamdon, Ilminster, Somerset.
—[ADVT.]

McLACHLAN & SONS, 35, St. James's-street, S.W. Builders, Decorators, and House Painters.
Designs and Estimates.
General Repairs and Alterations Executed.
Experienced Workmen always in readiness, and sent to any part of the country.—[ADVT.]

BATH STONE.
SUMMER DRIED,
CORSHAM DOWN,
100,000 Feet Cube.
PICTOR & SONS, BOX, WILTS.
[ADVT.]

TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender—it adds to the value of the information.

ASHTON-UNDER-LYNE.—For decorations in the large room of the town hall, for the Ashton town-council :—
Greenhalgh and Beesley (accepted) ... £88 0 0

BARKING.—For new road and surface-water drain, for the British Land Company (Limited), on their estate at Barking. Mr. Henry B. Michell, surveyor :—

Crockett, W.	£525	0	0
Acock, G. T.	495	0	0
Keeble, F. W.	490	0	0
Killingback, C....	485	0	0
McKenzie and Co.	475	0	0
Dunmore, T. G.	430	0	0
Thompson and Son	400	0	0
Harris, W.	398	0	0
Bloomfield. J.	395	0	0
Pizzey, J.	385	0	0
Wilson, E.	350	0	0
Peill, E.	340	0	0
Jackson, J.	322	0	0

BOW.—For the erection of relief offices and dispensary in the Fairfield-row, Bow, E. Messrs. Hills and Fletcher, architects :—
Crisp and Tomlin (accepted)... ... £800 0 0

CARDIFF.—For the erection of Severn-road schools, to accommodate 870 children, for the Cardiff school-board. Mr. Jno. P. Jones, architect :—

Jeffries, E., Cardiff	£7,935	8	6
Thomas, D , Canton	7,891	16	6
Thomas, D., Roath	7,825	0	0
Bird, C., Canton	7,450	0	0
Force and Ashby, Bristol	7,300	0	0
Williams, D. and Son, Canton ...	7,160	0	0
Stephens and Barstow, Bristol ...	6,999	0	0
Bowers, Hereford	6,995	12	0
Watkins, T. & Jenkins, Swansea	6,989	0	0
Lock, F. S , Cardiff...	6,944	0	0
Price, R., Cardiff	6,830	0	0
Thomas, G., Pembroke	6,810	0	0
Davies, Cardiff	6,795	0	0
Howell and Son, Bristol	6,772	0	0
Howard, E., Cardiff	6,755	0	0
Shepherd, C. ,, ...	6,689	0	0
Purnell and Fry ,, ...	6,677	0	0
Lewis, Bros. ,, ...	6,595	0	0
Shepton, S. ,, ...	6,540	0	0
Thomas, J. ,, (accepted) ...	6,523	0	0
Gough, T. ,, (withdrawn)...	6,410	0	0
Heines & Hole ,, (withdrawn)...	5,950	0	0

CARNOUSTIE.—For works of water supply, including storage reservoir, collecting and filtering adits, and upwards of 8 miles of main and distributing supply pipes from 2in. to 8in. bore. Mr. Alexander McCulloch, A.M.I.C.E., engineer :—
Mackay, G., Broughty Ferry (accepted for the whole of the five contracts) £5,077 19s. 7d.

CHISWICK.—For black-board, model throne, desks, presses, and other fittings in the new school of art, Bedford Park. Mr. Maurice B. Adams, A.R.I.B.A., architect :—

In yellow deal :—

Holland and Sons, Mount-st., W...	£145	0	0
Lascelles, W. H., Buchill-row ...	111	3	0

In yellow deal or pitch pine :—

Robertson and Son, Alnwick ...	117	5	0

[The last estimate for pitch-pine accepted, and the order increased to £145 6s.]

COLCHESTER.—For the erection of a new holder and tank, for the Colchester Gas Company :—
For the holder :—
Walker, J. and W., London (accepted).
For the tank :—
Everett, H. and Son, Hythe Hill, Colchester (accepted) £3,270.

[Eight tenders received for tank.]

CONSETT, Co. DURHAM.—For new P. M. schools and classrooms. Mr. Thomas Southron, South Shields, architect :—

Emerson, W., Tow Law	£662	6	1½
Blackett, W. and R., B. Auckland	614	16	0
Eltringham, J., Benfieldside ...	589	5	0
Barber, P., Blackhill	581	0	0
Heslop and Surtees, Benfieldside ...	575	13	0
Armstrong and Richly, Black Hill	564	14	0
Davison, T., Consett	560	16	0
Ridley, W., Tow Law	560	0	0
Atkinson, J., Gateshead	557	14	4
Westgarth, W., Black Hill	515	15	0
Knox, W., Consett	508	4	0
Separate tenders accepted for ...	489	19	0
Hot-water apparatus :—			
Walker and Emley	40	0	0

DORCHESTER.—For museum and school of art, &c. Mr. G. R. Crickmay, architect. Quantities by Messrs. Nixon and Raven :—

Davis and Son	£4,930	0	0
Innes	4,930	0	0
Church...	4,830	0	0
Crook	4,816	0	0
Clark	4,778	0	0
Stephens and Bastow	4,418	0	0
Hatherly	4,417	0	0
Tilley	4,064	0	0
Wellspring	4,058	0	0
Bull and Sons	3,950	0	0
George...	3,935	0	0
Gregory	3,858	0	0
Guy (accepted)	3,743	6	0
Hucy	3,699	0	0

DEWSBURY.—For two semi-detached villas at Thornhill, Lees. Messrs. John Kirk and Sons, architects, Huddersfield and Dewsbury. Accepted tenders :—
Masons : C. Whitehead and Sons.
Joiner : T. Child.
Slaters : Brear and Fawcett.
Plumber : Jno. Wright.
Plasterer : Jno. Broadbent.
Painter : J. H. Stuttard.

EALING.—For new roads and sewers, for the British Land Company (Limited), on their estate at Ealing. Mr. Henry B. Michell, surveyor :—

Acock, G. T.	£2,476	0	0
Crockett, W.	2,438	0	0
Bloomfield, J...	2,350	0	0
Thompson and Son	2,315	0	0
Wilson, E.	2,300	0	0
Killingback, C.	2,300	0	0
Peill, E.	2,295	0	0
Dunmore, T. G.	2,268	0	0
McKenzie and Co.	2,240	0	0
Keeble, F. W.	2,235	0	0
Jackson, J.	2,222	0	0
Harris, W.	2,219	0	0
Pizzey, J.	2,187	0	0

ECCLES.—For detached villa in Bentcliffe Park, for Charles Rawson, Esq. Mr. Thomas Hartas, architect, 26, King-street, Manchester. Quantities by Mr. T. H. Stone, Todd-street, Manchester :—

Burnell	£722	0	0
Harrison, Greenheys	711	0	0
Napier	710	0	0
Hibbert, Greenheys	660	0	0
Brooks and Son, Patricroft	645	0	0
Wilson, Toft, and Huntley	638	0	0
McFarlane	637	0	0
Daniels, Pendleton	627	0	0
Smith and Goodwin	624	0	0
Fletcher	615	0	0
Maben and Fairnington	612	0	0
Shaw (accepted)	598	0	0

GAINSBOROUGH.—For new baths, for the Gainsborough local board. Messrs. Wilson and Masters, architects, Sheffield and Doncaster :—

Whole tenders :—

Powell and Sons, Sheffield... ...	£1,250	0	0
Rigby, W., Worksop	1,200	0	0
Naylor, G., Clay Cross	1,185	0	0
Laycock, W., Hunshelf	1,144	0	0
Salt, T. A., Gainsborough... ...	1,096	0	0
Smith, W., Sheffield	1,085	0	0
Mason, H., Gainsborough... ...	1,080	0	0
Wortley, B., Kilnhurst	1,075	10	5
Staniland, B., Doncaster	1,069	12	0
Adams, Rotherham...	1,049	10	0
Dent, G., Brigg	1,040	0	0
Meggitt, E., Thorne	1,035	10	0
Wilson, J., West Retford	990	0	0
Bulling, J., Ollerton, Newark* ...	981	18	0

* Accepted.

Plumber :—

Bradford and Co.	£291	0	0
Braithwaite and Co., Leeds... ...	289	0	0
Elliott, J., Sheffield	265	0	0
Meggitt, E., Thorne	240	0	0
Cullabine, Sheffield	235	0	0

Mason :—

Laycock, W. Hunshelf	570	0	0
Smith, W., Sheffield	540	0	0
Wortley, B , Kilnhurst	495	10	0
Meggitt, E., Thorne	495	3	10

Plasterer :—

Meggitt, E., Thorne	14	17	0
Hodkin and Jones, Sheffield ...	14	0	0

Carpenter and joiner :—

Illingworth, Bros., Bradford ...	280	0	0
Greaves, Sheffield	248	0	0
Smith, J., Sheffield	217	14	0
Meggitt, E., Thorne	209	15	7

Painter :—

Watkins, Meadowhall	38	15	9
Meggitt, E., Thorne	35	13	6

Slater :—

Cooper, Doncaster	47	5	0
Tune, W. J., Sheffield	42	0	0
Meggitt, E., Thorne	40	0	0

Lowest joint single tenders :—

Mason : Meggitt	£495	3	10
Carpenter : ,, ...	209	15	7
Slater : ,, ...	40	0	0
Plumber, &c. : Cullabine	235	0	0
Plasterers : Hodkin and Jones ...	14	0	0
Painter : Meggitt	35	13	6
	£1,429	12	11

GRAVESEND.—For the paving of West-street, for the town-council. Mr. J. Elkin, acting surveyor :—
Booth (accepted) £410 0 0
[Lowest but one of nine tenders, ranging from £542 10s. to £269.]

HALIFAX.—For the erection of a temporary bridge over the river Calder, at Luddenden Foot, for the local board. Messrs. Utley and Gray, of Halifax, architects :—
Sutcliffe, G. and Son, Warley-town (accepted) £138

ILFORD, ESSEX.—For erecting chapel, laying out, draining, and inclosing ground, for the Great Ilford burial board. Mr. C. J. Dawson, architect, of Barking and Ilford :—

	Contract 1. Laying out and drainage.	Contract 2. Inclosing the ground.	Contract 3. Chapel.
Coker, Luton	£401 4 0	£741 0 0	£1,280 14 0
Drake, Ilford	—	525 0 0	785 0 0
Mills, Ilford	327 0 0	498 0 0*	708 0 0*
Smith, Barking	325 0 0	—	—
Holloway, East Ham	298 0 0	—	—
Wood, Chelmsford	288 0 0	492 0 0	727 0 0
Thorogood, Romf'd	280 15 6	529 5 0	681 11 3
Wood, Leytonstone	268 0 0	519 0 0	695 0 0
Impey, ,,	272 19 2*	—	—

* Accepted.

GATESHEAD-ON-TYNE.—For the erection of board-schools to accommodate 707 children. Messrs. Oliver and Leeson, architects. Newcastle-on-Tyne. Quantities supplied :—

Mitcheson and Co.	£5,159	0	0
Loraine, S.	5,148	0	0
Ferguson, F.	5,059	0	0
Westgarth, G.	4,981	0	0
Nicholson, W.	4,648	0	0
Lowrie, J. and W.	4,569	0	0
Broomhead and Keswick	4,479	0	0
Allison, R.	4,435	0	0
Elliott, J.	4,337	0	0
Smith, W. L....	4,310	0	0
Wilkinson and Westgarth ...	4,286	0	0
Fortune, T.	4,278	0	0
Grisdale, J.	4,266	0	0
Johnson, J.	4,250	0	0
Lamb, T. and R.	4,220	0	0
Lister, G. and Co.	4,218	0	0
Bell, G....	4,197	0	0
Pickhaver, R....	4,161	0	0
Atkinson, W. C.	4,156	0	0
Reed, N. and B.	4,150	0	0
Atkinson, H.	3,987	0	0
Greason and Stockdale	3,925	0	0
Atkinson, J. and Son	3,902	0	0
Rippon, J.	3,898	0	0
Miller, J. L.	3,740	0	0
Thompson, A.	3,728	0	0
Robson, R. and Son...	3,700	0	0
King, C. W.	3,695	0	0
Haswell and Waugh	3,691	0	0

[Cost per child equivalent to £5 4s. 5d., including caretaker's house, boundary walls, covered playsheds, cemented playgrounds, &c.]

KENSINGTON.—For the erection of public urinals, rear of vestry hall, for the Vestry. Mr. William Weaver, C.E., surveyor :—

Mears	£530	0	0
Wilkins	489	0	0
Cowland, Bros....	482	0	0
Colley	465	0	0
Hockley	439	0	0
Braid and Co. (accepted)	415	0	0

(Surveyor's estimate, £415.)

KING'S-CROSS.—For reconstruction of premises, for Bramston Gotto, Esq., York-road, King's-cross, N. Mr. Jabez H. Money, architect, 49, King-square, W.C. Quantities supplied :—

Gann, G....	£610	0	0
Lister, Bros.	595	0	0
Austin, A.	575	0	0
Keen, J.	575	0	0
Coulter, W. H....	494	0	0
Wilson and Exton	447	0	0
Ward, J. and Lamble	443	0	0
Spencer and Co. (accepted)	420	0	0

LONDON.—For sundry repairs and decorative works to Webb's restaurant, Chancery-lane. Mr. J. W. Stevens, architect, 6, Southampton-buildings, W.C. :—
Beale (accepted).

PENRITH.—For additions to Beacon Bank, Penrith. Messrs. Hetherington and Oliver, architects :—
Builder, joiner, and slater :—
Grisenthwaite, Penrith (accepted)... £573 6 1
Plasterer, painter, glazier, plumber, and gasfitter :—
Porter & Dixon, Penrith (accepted) £136 8 1
[Mr. Jno. Richardson also tendered for builder, joiner, and slater; amount, £574.]

PORTSLADE.—For the plant, machinery, and various brewery utensils for the new brewery, Portslade, near Brighton, for Messrs. J. Dudney and Sons. Messrs. Scamell and Colyer, civil engineers, 18, Gt. George-street, Westminster, S.W. :—
Contract No. 3, boilers :—

Appleby, Bros.	—		
Cater, Walker, Sons, and Co., London	£1,685	0	0
Horton and Son, London	888	0	0
Thornewill & Warham, London*	886	0	0

* Accepted.

Contract No. 4, millwright's work :—

Hunter & English, London ...	£3,874	0	0
Pontifex and Sons, London ...	2,985	0	0
Bennett, London	2,924	10	0
Thornewill & Warham, London...	2,728	0	0
Oxley and Co., Frome	2,560	10	0
Pontifex and Wood, London ...	2,510	0	0
Woods, H. and Co., Manchester...	2,500	0	0
Wilson and Co., London	2,473	9	10

Contract No. 5, coppers, underbacks, coils, &c. :—

Shears, London	£1,139	0	0
Blundell, Bros., London	1,031	4	0
Pontifex & Sons ,, ...	1,016	0	0
Bennett ,, ...	985	0	0
Dale, J. and Co. ,, ...	960	1	6
Pontifex and Wood ,, ...	825	0	0
Brindley & Briggs, Burton-on-T.*	817	0	0

* Accepted.

Contract No. 6, slate tuns, yeast backs, &c. :—

Sharp and Sons, London	£1,166	0	0
Brindley ,, ...	1,035	0	0
Braby and Co. ,, ...	985	0	0
Stirling ,, ...	908	0	0
Ashton and Green (accepted) ...	658	0	0

Contract No. 7, copper and iron pipe connections, attemperators, &c. :—

Shears, London	£2,440	0	0
Dale, J. and Co., London... ...	2,314	0	0
Siebe and Gorman, London ...	1,959	0	0
Oxley and Co., Frome	1,826	9	0
Blundell, Bros., London	1,700	6	0
Wilson and Co., Frome	1,606	18	7
Pontifex and Sons, London ...	1,580	0	0
Bennett, London	1,520	0	0
Thornewill and Warham, London	1,450	0	0
Brindley & Briggs, Burton-on-T.*	1,435	0	0

* Accepted.

Contract No. 9, refrigerators :—
Lawrence and Co., London £285 0 0

READING.—For the erection of a baker's cottage, shop, oven, &c., at Stoke-row, near Reading, for Mr. Stephen Smith. Mr. Wm. Simmons, architect, Reading. Quantities supplied :—
Godwin, Stoke-row £327 8 1

SALTASH.—For sewerage works in Saltash, East Cornwall, for the St. Germans Rural Sanitary Authority. Mr. Appleton, engineer;—

Shaddock	£479	0	0
Willcocks (accepted)	415	0	0

WANDSWORTH.—For new roads and sewers, for the British Land Company (Limited), on their estate at Wandsworth-common. Mr. Henry B Michell, surveyor:—

Killingback, C.	£2,200	0	0
Crockett, W.	2,138	0	0
Acock, G. T.	2,027	0	0
Keeble, F. W.	1,985	0	0
Dunmore, T. G.	1,900	0	0
Pizzey, J.	1,850	0	0
Harris, W.	1,846	0	0
McKenzie and Co.	1,820	0	0
Jackson, J.	1,650	0	0
Bloomfield, J.	1,600	0	0
Peill, E.	1,595	0	0
Thompson and Son	1,590	0	0
Wilson, E.	1,500	0	0

WALKDEN.—For the construction of an intercepting sewer with manholes, lampholes, &c., in Ashton's Fieldstreet, Walkden. Quantities supplied by the engineer, Mr. John Price, A.M.I.C.E.:—

Snape, Wm. and Sons, Eccles ...	£287	11	0
Harrison, W., Salford	264	9	2
Taylor and Duckworth, Denton ...	196	14	0
Claridge, T., Walkden	191	4	0
Williams, J. E., Chester	188	9	0
Noden, J., Swinton	185	0	0
Unsworth, J., Walkden	181	2	0
Davis and Holt, Balton	167	11	0
Turner, R. and Sons, Warrington...	156	8	0
Jackson, J., Walkden (accepted) ...	149	8	8

(Engineer's estimate, £150.)

STONEHAVEN, N. B.—For the erection of a villa in New Mount, for Mr. W. Monatt, junr. Accepted tenders:—
Masonry: J. Smith.
Joinery: J. Ross.
Slating: G. Valentine.

WOLVERHAMPTON.—For about 300 yards of five-barred fence 4ft. high, for inclosing part of Barnhurst sewage farm, for the Wolverhampton town-council:—
Bayliss, Jones, and Bayliss (accepted) 2s. 9d. per yard.

BEST BATH STONE.

Westwood Ground, Box Ground, Combe Down, Corsham Down, and Farleigh Down.

RANDELL, SAUNDERS, & CO., LIMITED,
CORSHAM, WILTS.

TURPIN,
22, QUEEN'S ROAD
BAYSWATER, LONDON, W.
MANUFACTURER OF
The Best and Cheapest

PARQUET FLOORINGS.
150,000 ft. super. in Stock, ready for Laying
RIGA INCH OAK FLOOR BOARDS,
1s. per foot super. (grooved & tongued).
Immense Stock always ready for Laying.

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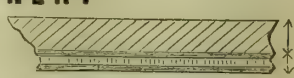
All Styles executed for the Trade at Special Rates. Skilled Artisans sent to all parts of the country.
Estimates and Designs on Application.

ARTISTIC JOINERY

THIN PARQUET (Turpin's Patent). 5-16 inch thick, prepared on deal back laminations, equal in wear to inch Solid Parquet. Used for Veneering old existing deal floors, and is susceptible of removal at pleasure. See Construction.



ORNAMENTAL PARQUET.
DEAL BACKING

WANTED.

TO ARCHITECTS.—An Architect's Assistant requires a SITUATION; can be well recommended by present employer; terms moderate.—Address, F. LONG, Town Hall Chambers, Bradford-on-Avon.

WANTED, a SITUATION as Assistant in an Architect's Office; passed the R.I.B.A. Preliminary Examination, 1880; also Science and Art Examinations in Advanced Architecture, Advanced Building Construction, and holds full Drawing Certificate; first-class references.—E. H. D., Manor place, Hale, Farnham, Surrey.

PARTNERSHIP. — WANTED, Partner, active or otherwise, in an established Masonry and Contractor's Business in Manchester, with a first-class connection; capital required, from £2,000 to £2,500; references given and expected.—Address, Mr. RIDEAL, Solicitor, 12, Brazennose-street, Manchester.

TO ARCHITECTS.—First-class Royal Academy Student desires RE-ENGAGEMENT as Assistant in a London Office.—G. H. C., 44, Finsbury-pavement, E.C.

ARCHITECTURAL DRAUGHTSMAN (first-class), requires immediate RE-ENGAGEMENT in London. Perspectives, coloured and etched (good style) well up in competition and all other drawings; good experience; specimens.—H., 82, Lamb's Conduit-street.

BUILDER'S CLERK requires a SITUATION, age 35, married, thoroughly well up in making out day-work, accounts, keeping prime cost, and the general routine of a London Office; 8½ years with present employers.—H., Mr. Browns, 195, Strand.

WANTED, a FOREMAN, with a general knowledge of the Building Trade, to take charge of the Plastering and Decorating Branches of an Old-established Business.—Address, with full particulars and references, LEWIS and SONS, Regent-street, Clifton.

ASSISTANT (Architect's), 30; thoroughly reliable; details, specifications, and superintendence; 12 years' reference; terms moderate.—B., 10, Cambridge-place, Norfolk-square, W.

MANAGER.—A Gentleman, capable of taking a leading position in an architect and surveyor's office, will shortly be at liberty; excellent testimonials and London references.—Address, "L.," 4, Cavendish-road, Leicester.

ASSISTANT (Architect and Surveyor's) desires a RE-ENGAGEMENT. Thoroughly experienced in design, details, quantities, surveying, levelling, and superintendence of works. Good draughtsman.—Address, R., Mr. Emery, 146, Belgrave-gate, Leicester.

ASSISTANT (Architect and Surveyor's General) desires RE-ENGAGEMENT at once; Working Drawings, Details, Quantities, Superintendence, Measuring up, &c., or would not object to act as Clerk of Works.—ARCHITECT, 39, Market-place, Leicester.

ASSISTANT (Architect and Surveyor's), neat and expeditious, requires ENGAGEMENT; 5 years' experience, Surveying, Levelling, Working, and Detail Drawings, Perspective, fair knowledge of Quantities; salary, 25s. per week; present situation permanency, £2 per week; good references.—H., care of Mr. Franklin, Guildhall-road, Northampton.

BUILDER'S CLERK, good Bookkeeper, Measuring up Work, Quantities, Estimating, the Preparation of Plans, &c.; age 29; 13 years' good references. A seaside town in one of the Home Counties preferred.—H. J. P., 20, Queen's-road, Watford, Herts.

TO ARCHITECTS—Mr. J. O. SCOTT, F.R.I.B.A., desires to recommend a GENTLEMAN of very large experience and practical knowledge as a leading Assistant, or as a Partner, he was for many years with the late Sir Gilbert Scott, and had the management of several of his principal works.—Address, 31, Spring gardens, London, S.W.

A GRADUATE of OXFORD, who has served articles with a firm of Architects and Surveyors, wishes to join a gentleman with good provincial practice.—Address, S. S. BROWN, M.A., Devonshire Club, Eastbourne.

LINCOLN'S INN FIELDS. — For SALE, by Private Treaty, an exceedingly Valuable FREEHOLD PROPERTY, covering a large and important area, with vacant possession.—Apply to MESSRS. BRIDGES, SAWTELL, HEYWOOD and CO., Solicitors, 23, Red Lion-square, W.C., or to Messrs. EDWIN FOX and BOUSFIELD, 99, Gresham-street, Bank, E.C.

FOR SALE, by PRIVATE CONTRACT, FREEHOLD COTTAGE PROPERTY, with arable land attached, paying good interest, well situated, and increasing annually in value; no agents need apply.—For particulars, address X., care of Housekeeper, 9, Gracechurch-street, E.C.

TO BRICKMAKERS.—To be LET, with immediate possession, a small BRICKFIELD, situated a short distance from London, near a Railway Station. It is expected that building operations will be commenced on other portions of the Estate during the present year.—For particulars apply to Mr. D. W. ASTON, Surveyor, 1, Addison-road, Kensington, W.

SHEPHERD'S BUSH.—TO MANUFACTURERS, BUILDERS, and others requiring capacious Business Premises.—To be LET on a REPAIRING and BUILDING LEASE for 80 years, direct from the Freeholder, the 2 DWELLING HOUSES, with Stabling and large Gardens, No. 1 and 2, Brunswick Villas, Uxbridge-road. The property is situate in the midst of a populous and business neighbourhood, midway between the Shepherd's Bush and Acton Railway Stations, with tram car and omnibus accommodation. The frontage to the Uxbridge-road (suitable for high-class shops) is 77 feet, the rear frontage 111 feet, and the average depth is nearly 200 feet. A plan of the Estate can be seen at the office of Mr. GEORGE LOW, Architect, 10, Basinghall-street, E.C., to whom proposals are to be sent.

MAGNIFICENT BUILDING PLOTS to be LET on the Site of the Surrey Chapel, Blackfriars-road, suitable for warehouses or manufacturing purposes, on account of its close proximity to the City; splendid lighting; extensive frontage; or the Chapel and Buildings would be let together or separately as they stand if satisfactory terms were arranged.—For further particulars apply to W. HEWSON LEES, Architect and Surveyor, 27, Doughty-street, Mecklenburgh-square, W.C.

EASTCHEAP and PHILPOT-LANE, City.—BUILDING SITE to be LET by TENDER by the Drapers' Company, on BUILDING LEASE for 80 years from Lady-day, 1881, a Corner PLOT OF LAND, with a frontage of about 75ft. to Eastcheap, and about 80ft to Philpot-lane, and containing a superficial area of about 7,500ft. The Land now forms the site of 11, 12, 13, and 14 Philpot-lane, and 42, 43, 43a, and 44 Eastcheap, the last being a fully licensed public house, known as the "King's Head." The land is situate in a most important position, on the north side of Eastcheap, and is not within the limits of deviation allowed by the Metropolitan and Metropolitan District Railways (City Lines and Extensions) Act, 1879, nor included in the Bill recently introduced by the Companies.

Tenders will be opened at a Court of Assistants of the Drapers' Company to be held at Drapers' Hall on WEDNESDAY, the 9th day of March, 1881. Forms of Tender may be obtained on application to Mr. CHARLES REILLY, 23, St. Swithin's-lane, and at the Clerk's Office, Drapers' Hall, Throgmorton-street, E.C., where a plan of the property may be seen, and any further information required may be obtained.

WEST COMBE PARK ESTATE, Blackheath (roads and sewers made, 20 minutes from Cannon-street).—100 acres of FREEHOLD LAND to be LET or SOLD, in large or small plots, according to situation. Railway Station on the property. Advances made.—For plans and particulars apply to Messrs. J. and J. S. EDMESTON, 12, Great Winchester-street, E.C.; Messrs. ISAACS and FLORENCE, 3, Verulam-buildings, Gray's Inn, W.C.; Messrs. BRISTOW, Solicitors, Greenwich; or to Mr. Z. PARKES, at the Estate Office, West Combe Park Station.

FOR IMMEDIATE DISPOSAL.—The Extensive and Complete FREEHOLD PREMISES, consisting of Residence; with large Walled in Garden, Joiner's and other Shops, Stores, Steam Saw Mills, Yards, &c., many years used for a Builder's and Contractor's business by the late R. Futcher; also the Machinery, Plant, and remaining Portions of usual Builder's Stock in-Trade.—Apply to the Executors, Fisherton Works, Salisbury.

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BUILDING SITES.—ILFRACOMBE. LAND to be LET or SOLD in Torrs Park, Wilder Park, Highfield-road, Hillsborough, Langleigh, Braunton-road, Barnstaple-road, Church-road, and High-street.

MORTHOE.—Several Valuable Sites to LET facing the sea, near Barricane Beach, and close to Woolacombe.

LEE.—Good Lodging-House or Villa Sites, near the sea and in the valley.

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BUILDING LAND TO BE LET, adapted for the erection of 12 Villas in the best part of Southfields, Wandsworth.—Apply to Messrs. BEAL and SON, 20, Regent-street, Waterloo-road, S.W.

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ROYAL SCHOOL OF MINES.

The Third Course of the Session, consisting of Six Lectures on APPLIED MECHANICS, will be delivered at the Science Schools, South Kensington, by PROFESSOR GOODEVE, M.A., commencing on MONDAY, the 28th inst., at 8 o'clock. Tickets may be obtained at the Museum of Practical Geology, Jermyn-street, by working men only, on Monday next, the 21st inst., from 7 p.m. on payment of 6d. for the course. Each applicant must bring his name, address, and occupation written on paper for which the ticket will be exchanged.

F. W. RUDLER, Registrar.

ASPHALTE.—THE SEYSSEL AND METALLIC LAVA ASPHALTE CO. (Mr. H. Glenn) Office, 38, Poultry, E.C. The best and cheapest materials for damp courses, railway arches warehouse floors, flat roofs, stables, cowsheds, and milk-rooms, granaries, tun-rooms, terraces.

UNDER THE PATRONAGE OF H.M. THE QUEEN.

LONDON PARQUETRY WORKS, Founded in 1841 for the exclusive production of HIGH-CLASS PARQUETRY. Orders received through Messrs. WRIGHT and MANSFIELD; MORANT and Co.; JOHNSTONE, JEANES, and Co., SUTHERLAND, Manchester; and by C. STEINITZ, 18, Old Quebec-street, W.; 45, Grove-lane, Camberwell; and Stratford, E. N.B.—Competitions respectfully declined.

TO ARCHITECTS.—COMPETITION and ARCHITECTURAL DRAWINGS of every description. Coloured in the first style by GEO. CHILDS, Artist, 21, Offord-road, Caledonian-road, Islington, N. Perspectives outlined by Competent Draughtsmen. Pupils required.

MESSRS. HAZELL and GOLDRING, Surveyors, 32, Theobald's road, Bedford-row, W.C., are prepared to FINANCE BUILDERS upon houses in course of erection up to £5,000 on moderate terms. Early application should be made.

THE BUILDING NEWS.

LONDON, FRIDAY, FEBRUARY 25, 1881.

DISLOCATION IN DESIGN.

ONE of the many points dwelt upon by Professor Street in his opening lecture at the Royal Academy, reported in full in our last issue and again to day, was the importance of relation in the design and sketching of features. Coming from so able an exponent of the Gothic School, the advice seems to possess more weight than if an authority on the opposite side had inculcated the same doctrine, and we think, on this account, it deserves the attention of all, particularly those who are ready and willing to learn.

In a recent article we had ourselves remarked upon the absolute duty of the architect to make the parts and features of his building bear some sort of relation to the spectator, more especially with reference to the height and scale of mouldings and carved ornament, light and shade. In competition designs one is accustomed to see a most flagrant disregard of this kind of architectural adaptation; but when one comes to see actual buildings carried out upon a system of hetercogeneous patchwork with big and little, coarse and refined features, mixed together without scale and with no pretence to method, we might almost imagine architecture to have sunk into hopeless degeneracy. With some architects this laxity of method seems habitual; they seem to have imbibed their architectural knowledge from the scrapbook, and to have looked upon the parts of great buildings somewhat in the light of a disjointed puzzle. It is all "bits" with them: there is no idea of design as a work of synthesis, certainly none of connection or coherence. No conception or central idea runs through their compositions, except when they boldly copy some other building. We believe this weakness to be largely due to the manner in which students make sketches of old buildings, and Professor Street has happily pointed to it in speaking of sketching. "Remember always," he says, "that sketches of mouldings alone, without equally accurate sketches of the features to which they belong or with which they are connected, are useless." The same remark may, with equal force, be applied to every separate or isolated feature of a building. With respect to mouldings, there is a common idea that anything will answer the purpose of one if it is made to project, and is divided into parts. Its height above the eye, its vertical dimension, and its projection, are all important; but the size, number, and contour of the members are paramount considerations to the designer who has any desire to make people respect the work as the evidence of design. In nature, plan and purpose are visible throughout every object, and the argument from design has been pressed into service by philosophers and theologians; in architecture the argument, we fear, would rather confound and perplex any future architectural anti-Darwinite who used it. The want of relation and connection between mouldings and their positions, is not the only or even the most palpable form of the disjunction or dislocation of features. More than once lately we have drawn attention to the sculptured decoration of new buildings, and have protested against the meaningless procedure of sticking copies of Renaissance artists' work in positions the originals were never intended to occupy. Professor Street, referring to this point, attributes the fault to its right origin. He attaches little importance to drawings of ornament or sculpture made from casts in schools. The pupil sketches them as objects close to the eye, and, losing sight of their original connection in the edifice, is wont to introduce them as ornament in various parts of buildings, regardless of position. No better advice can be given than that "all architectural features in which carving is introduced ought to be looked at and drawn in the very place for which they are intended." Instances occur to us of bosses and string-courses carved by the Mediæval sculptor for the aisle of a church, which we have seen made to do service in a clerestory considerably above the eye, where one would only look for the indication of a bold leaf or some vigorously expressed features. How useless and wasteful of skill and labour it is to put the same amount of detail and elaboration in a piece of carved work which will never be seen, and another piece fixed close to the eye, it is needless to prove by argument; yet architects are constantly doing it, and the carvers are not always conscientious or skilled enough as artists to use their discretion. The habit of seeing things in one's mind as they will be seen *in situ*, though so important a matter, is singularly lost sight of. With one class of artists, neatness is a magnified virtue everywhere, and equal care is bestowed in the carving of the bands or finial of a spire as in that of a font or pulpit. Excellent as a quality, these artists are led into a rather mistaken belief of the omnipresent power of fine carving, without the reflection that the same amount of labour may be profitable in one place and thrown away in another.

Many of the most conspicuous failures in architectural design are owing to the neglect of realising in the artist's own mind the effect of a building when erected, and the value of perspective is mainly its use in enabling us to detect any fault or blemish in the conception, either in its composition or light and shade. For this reason we are glad Professor Street enjoined upon the students of the Academy the importance of the power of perspective sketching, and in picturing in their minds the result of any design. It is necessary, however, to point out that there is the art of "tricking up perspectives"—a practice largely resorted to by experts who are paid for making perspective drawings as attractive as they can, and that this art of making a design captivating is a very different art to the perspective sketching which the lecturer advocated, and which rather exposes the defects and want of proportion of a design, enabling its author to remedy them before too late. Perspective, to be of use, must be a truthfully correct representation of facts, not an artfully prepared picture; it should be rather the tentative means to an end, not the imaginary end—a drawing put forward to misrepresent the reality. But the truth is the competition architect uses the art in quite another way; he does not often trouble about making a perspective himself, to satisfy and solve any doubts in his own mind; but he gets an artist to make one for him, and this is done to conceal defects, and not till after the actual designs, and all the drawings have been prepared. Let young architects learn this art for its own sake, and the power it gives them to design artistically and comprehensively; and let them resolutely eschew the practice of making drawing a false vehicle of design, and they will soon begin to appreciate the power of coherent compositions and the importance of conceiving everything by scale and from a true standpoint.

THE WATER QUESTION.—III.

WEIRS in rivers serve three useful purposes: they create a head of water for the working of mills, they facilitate the navigation, and they hold up the water in dry seasons within the reach of the roots of plants, and promote vegetation in the adjoining lands. They are so numerous and useful for these purposes that they cannot, with any regard to commercial and agricultural economy, be done away with; but many of them are of extremely rude and uneconomical construction, and as long as they remain so they offer a standing subject of dispute amongst the varied interests in a river basin. Some of these badly-constructed and inefficient fixed weirs might be advantageously replaced by movable weirs. These consist of doors hinged horizontally under water, and can be lowered so as to lie flat on the bottom of the river, and allow flood waters to pass over them, being raised again on the subsidence of a flood by chains and machinery to keep up the head of water in ordinary times; and in rivers of shallow water they afford a means of navigation. But the passage of floods can be sufficiently well provided for by means of fixed weirs provided with sluices, to be lifted vertically by rack and pinion, or by a crab travelling overhead along the line of sluice-gates, whereby a part of the water is passed off underneath.

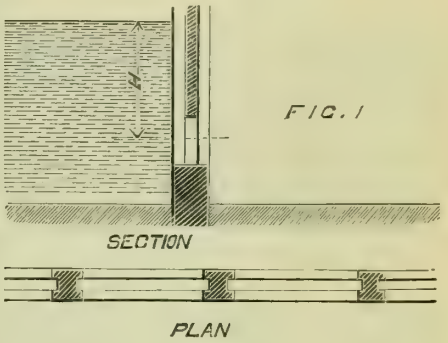


FIG. 1

The quantity of water which can be passed off in this way, and the height to which any given volume of water will rise against the sluice-gates, with any given opening, may be found approximately thus:—

Let Q be the quantity in cubic feet per second;
L the aggregate length in feet of all the openings;
H the height in feet to which the water will rise above the centre of the openings—supposing all the gates to be drawn to the same height, and that their sills are all on the same level;
and h the height to which the gates are drawn;

Then, $Q = Lh \times 5\sqrt{H}$,

and $H = \left(\frac{Q}{5Lh}\right)^2$.

In this case the form of the sluice-openings is taken to be of the ordinary abrupt

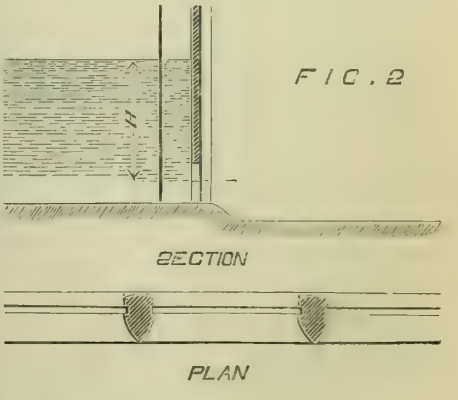


FIG. 2

construction shown in Fig. 2, where 5 would be the constant multiplier proper to that form. If the openings of the gates be 20ft., the sill 6ft. below the head of water, and the gates be drawn 2ft., the head H will be 5ft., and the quantity of water passing through in cubic feet per second will be approximately $Q = 20 \times 2 \times 5\sqrt{5} = 447$.

But by making a floor, extending upstream 8ft. or 10ft. from the sill upon which the gates shut down, and on the same level as the sill, and by forming the sides of the openings in curves approaching the form of the "contracted vein," the proper constant becomes 7 or thereabouts, and the quantity will be approximately as follows:—

FIG 3

SECTION

The openings of a sluice thus formed are 20ft. wide, at the end of a weir 100ft. long. When the gates are drawn 2ft. the water stands level with the crest of the weir, 6ft. above the sill of the sluice, and the water in the pool below stands nearly up to the level of the sill. The quantity of water which may be expected to pass through the sluice in cubic feet per second is—

$$L h \times 7\sqrt{H}$$
$$= 20 \times 2 \times 7\sqrt{5} = 626.$$

If the level of the water below the sluice is not wholly below the opening, as it was in the latter case, the head H is to be reckoned as being the difference of level between the surfaces of the water above and below the weir. When there is a depth of 15in. going over the weir, the water in the pool below is, *e.g.*, found to stand in a sheltered place 3·75ft. below the crest of the weir, and the sill of the sluice is 6ft. below it. The gates remain drawn 2ft. as before.

Under these circumstances the approximate quantities of water which may be expected to pass through the sluice and over the weir respectively, are as follow, in cubic feet per second, the depth (d) being 1·25ft., measured from the crest of the weir to the surface where the water is comparatively still:—

Through the sluice $Lh \times 7\sqrt{H}$ $= 20 \times 2 \times 7\sqrt{5} = 626$	1,091
Over the weir $3\frac{1}{3}\sqrt{d^3} \times l$ $= 3\frac{1}{3}\sqrt{1{\cdot}953} \times 100 = 465$	

Although the circumstances of the passage through the sluice now are different to those of the former case, yet the quantity (626) appears the same, because the head is the same, viz., 5ft., in both cases, although the opening is in one case covered and in the other not so. With regard to the constant multiplier $3\frac{1}{3}$, it is derived from the coefficient ·625, which is taken to be the proper coefficient found by many experiments on the flow of water over weirs, and, from amongst the numerous coefficients so found, to be the most suitable to the circumstances of this weir. It indicates as the practical quantity $\frac{5}{8}$ths of that which would be due to the abstract law of gravity, or the theoretical quantity which would be represented by $\frac{2}{3}$rds of 8—neglecting a decimal of from ·02 to ·04, 8 being the square root of twice the force of gravity, or twice the velocity which a falling body has acquired at the end of the first second of its time of descent, and which, applied to water as to other falling bodies, is the fundamental law of all hydraulics; and the velocity of falling water varies as the square root of the height from which it falls, and the height from which the lowermost particles of the sheet of water going over a weir fall is the height from the surface of the water above the weir, where it is comparatively still, down to the crest of the weir, and as the velocity of the particles at every point in the height decreases upwards as the square root of the depth below the surface, the mean velocity of all the particles of the sheet of water is two-thirds of that due to the lowermost. If the sheet of water falling over a weir be 1·25ft., or any other depth, the velocity due to the lowermost particles is $8\sqrt{d}$, neglecting a small decimal of from ·02 to ·04; but the mean velocity of all its particles from bottom to top is only two-thirds of this, or $5\frac{1}{3}\sqrt{d}$, by the abstract law; and practically only about $\frac{5}{8}$ths of the quantity of water which this would represent passes over a weir of the form of that which has been referred to; and over no weir whatever does it much exceed $\frac{5}{8}$ths: in many weirs it is less. The constant $3\frac{1}{3}$ then, is thus derived, being $\frac{5}{8}$ths of $5\frac{1}{3}$, and applies to measurements in feet, and to the duration of one second of time.

Feet measurements, taken in hundredths, are better than inches, but not always convenient; and when the depth of water going over a weir is measured in inches, the constant $3\frac{1}{3}$ should be divided by the square root of the cube of 12, = 41·56; but then, when depths are not great, it becomes better to estimate the quantity in cubic feet per minute instead of per second, and in this case $3\frac{1}{3} \times 60 = 200$, and $\frac{200}{41{\cdot}56} = 4{\cdot}81$, the constant multiplier for these measurements: it is less than is sometimes adopted, and presupposes the water above the weir to have no velocity of approach, but to be still or nearly so; it is, therefore, subject to be increased where the water has a current in approaching the weir; the constant 5 or 5·1 is frequently applicable; and, indeed, for accuracy, every weir requires a careful study of its circumstances, and an equally careful examination of the results of experiments made under similar circumstances.

It may frequently be seen on rivers that weirs are aslant of the stream, as in Figs. 4 and 5.

FIG. 4

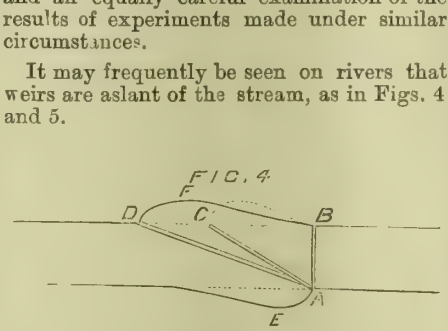
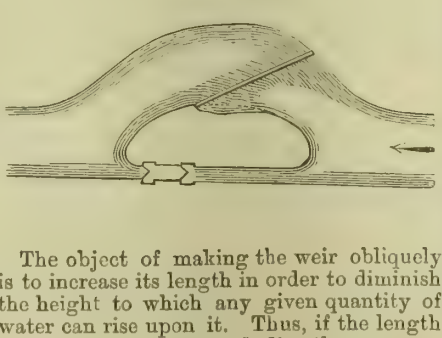


FIG. 5



The object of making the weir obliquely is to increase its length in order to diminish the height to which any given quantity of water can rise upon it. Thus, if the length (l) of a weir constructed directly across a river, as from A to B, Fig. 4, be 100ft., and the quantity of water coming down the river be such that it rises to a height (h) of 4ft. above the crest of the weir, the proportional number representing the quantity passing over would be 800, being $100 \times 4 \times \sqrt{4}$, or $100\sqrt{4^3} = 800$. If the length be made 200ft., as from A to C, the height would be $\sqrt[3]{\left(\frac{800}{200}\right)^2} = 2{\cdot}52$ft., and if the weir were made 300ft. long, as from A to D, the height would be $\sqrt[3]{\left(\frac{800}{300}\right)^2} = 1{\cdot}92$ft., and therefore, for the same elevation of the weir's crest, the height to which the water would rise above it in this latter case would be $4 - 1{\cdot}92 = 2{\cdot}08$ft. less than if the weir were placed directly across the stream. But there is a practical point to be attended to in these oblique weirs, which does not arise in the other case.

In approaching the weir the particles of water take a curved direction, tending to meet the line of weir at right angles, and the effect of this is that the bank below the weir at its upper end is worn away unless it is protected, and the proper form of construction is a curve as at E; and, further, when a weir is thus placed obliquely, the water has a tendency to run along the foot of the weir on its upper side and to wear it away; and to prevent this the bank should be curved out on the upper side at the lower end of the weir, as at F.

EDIS ON DECORATION AND FURNITURE.*

THERE are two ways in which different people will be likely to judge of the present work: by considering the principles advocated in it, and by looking at the examples which are given to illustrate those principles. To take the examples first, and those examples chiefly which show various modes of architectural decoration for houses, we cannot help noticing the strong light which they throw on the better and worse sides of the revived Semi-Classic. Never before, perhaps, have modern architects worked in a style which so frankly admitted itself to be a mere fashion, like the fashions by which dressmakers and milliners lead women captive at their will. Never before, perhaps, have they so cynically abandoned all pretence to reason, truth, or beauty as "motives" for detail, and relied so unblushingly on the mere novelty and popularity of the forms they adopt. On the other hand, they have never before attempted so fully to deal with the difficulties of domestic architecture, and to treat furniture, house-decoration, and secular art-work of all sorts in a characteristic manner, and not in one which is a mere echo of the great monumental styles. In Mr. Edis's book we can see numberless instances both of the good and the bad of the treatment in question. Such a book will long remain a valuable and suggestive contribution to the literature of house-design; but we fear it will not be long before the permanent in it will be somewhat hidden, to ordinary readers, by the decay of the temporary. The more pronounced a fashion is the more ridiculous it looks when it has ceased to be the fashion; and it is conceivable that a time may come when the style of architecture which Mr. Edis affects may seem as ill-chosen for the purpose of enhancing the beauty of his ideas, as the style of dress which the Queen Anne ladies affected was ill-chosen for the purpose of setting off the beauty of their faces. So much it is right to say to the shortsighted people, if there are any, who mistake the starting-point for the goal, and who think that the revived Semi-Classic, as it stands, is a perfect style, instead of being a mere rubbish-heap out of which some valuable elements of a style may by degrees be picked. That Mr. Edis

* Decoration and Furniture of Town-houses: a series of Cantor Lectures delivered before the Society of Arts, 1880; amplified and enlarged by Robert W. Edis, F.S.A., F.R.I.B.A., architect. With 29 full page illustrations and numerous sketches. London: C. Kegan Paul and Co., 1, Paternoster-square. 1881.

is not of this number it is needless to say; he clearly looks at the present style-fashion as something to transform and perfect, not to rest in. We ought to state, too, that only a minority of the illustrations represent designs of his own, though the greater part of them are in one phase or another of the style which we have referred to.

The most interesting part of Mr. Edis's work to architects in general is perhaps that on floor, wall, and ceiling decoration. Much of this relates to what may be done by way of improvement to existing houses. Mr. Edis first discusses the cutting away of old stone floors in halls and passages for the purpose of laying above them marble or tile pavements. This, as being troublesome and costly, not to say dangerous, he does not advocate. Neither does he recommend the use of those very inartistic materials, oil-cloth and linoleum; but suggests several modes of treatment which would be fairly good. Thus the stonework may be kept white and used as a border for warm Persian or Indian rugs; better still, its margin may be painted a soft brown, or other suitable colour, to keep away damp and dirt; or, again, it may have a border of incised lines filled with coloured cement. In addition to this border the stone may have a large square or diagonal pattern of incised lines all over it, with small red or black tiles at the junction of the lines, or more expensively, it may have borders and patterns of inlaid marble slips. The paving, again, or marble mosaic may be laid over the stonework, and the additional height gradually champered off towards the doorways. Mr. Edis, we are glad to see, advocates a large proportion of quite plain tiling, instead of the wearisome decoration of every square inch of flooring which the manufacturers' pattern-books always show us. The same principle he insists on here, might with equal wisdom be applied to wall-surfaces, and even when we have found the best wall-papers that can be bought for money, it would be a wonderful relief, in most cases, to use them sparingly, and as a mere contrast to prevailing patternless spaces. This, however, is an advance which remains for the future, for most people at present do not think their principal rooms half finished as long as there remains a yard of patternless space to give a momentary repose to their eyes and brains. Mr. Edis, after discussing the floors of halls and staircases, proceeds to those of rooms, and goes into the relative merits of borders painted, stained, and parqueted. Next follow several pages on external coloured decoration, by way of brightening up our dreary stuccoed streets. The great difficulty architects have to contend with here, and everywhere else in the simpler class of coloured ornamentation, is that of getting their ideas carried out. Experience leads one to think that from some mysterious reason every man who has a colour-blind son, hastens to apprentice him to a house-painter: and no amount of practice ever enables the apprentice, in after-life, to execute an architect's design within a dozen shades of what it ought to be. No architect can afford to stand over a house-painter all day long; and very few such painters can be trusted to go on rightly any longer than an architect is touching them, supposing, that is, that the colours they are using are in the smallest degree uncommon; so that, as the final result, architects are afraid to use anything that can be termed colour at all.

Mr. Edis afterwards takes up the question of internal-wall decoration, mentioning in succession the Burmantofts *faïence*, tapestry, flock, and other wall-papers, including those stamped after the manner of leather; the so-called "Muralis," various kinds of painted tiles, and wood veneering. Friezes with figure-subjects, and also with birds and flowers, of course, come in for prominent notice. The latter, with the naturalistic treatment proposed for them, strike us as being out of harmony with the highly-conventional forms of the "Queen Anne" and Jacobean styles. "Naturalism," however, which in practice means copying the skin-deep forms of nature, and missing its all-pervading life, is having its day; and those who are heartily sick of it need only rejoice when it is so used that others are likely to be sickened of it also. In the matter of ceilings, Mr. Edis gives some very good advice; discourages figure-subjects, even apart from their expense; points out the danger, in existing houses, of using colour so as to make the bad plaster details even more offensive than they are, and seems to prefer delicate tints with some use of stencilling, and a slight picking-out of mouldings.

Having given, in outline, a brief abstract of one chapter, we can only indicate the subjects of the rest. They deal, in greater detail and minuteness, with the various portions and apartments of the house, such as the entrance-hall, the staircase, the dining-room, drawing-room, library, and boudoir, and the bedrooms, nurseries and offices. On all of these subjects there are a multitude of valuable suggestions, and a very complete account of the various materials and systems amongst which an architect may choose. There is a useful chapter on furniture, and another on such things as pottery, porcelain, glass, metal-work, locks, door-plates, and window-blinds. Of all these items there are illustrations; the examples are good of their kind, and as the makers' names are in all cases given, even those purchasers who know least of art workmanship can ascertain where their money may be safely expended.

TEN YEARS' EXPERIENCE IN INTERMITTENT DOWNWARD FILTRATION.*

MR. J. BAILEY DENTON, C.E., has just published the results of his experience in works of "Intermittent Downward Filtration," and a perusal of the facts brought forward will, we believe, remove many of the objections which opponents to that system of utilisation entertain. Mr. Denton fairly takes these objections to task, and, as far as we can find, shows that they are founded on imperfect views of the conditions required for a successful application. One of the most indispensable of these is that intermittency of application is necessary, even in "suitably constituted soils," and another, that under-drainage be adopted. The most desirable soils are obviously those partaking of the character of a sandy loam, and, therefore, to apply the system to dense clays, improperly prepared, is an unfair test of the capabilities of filtration. There is no doubt, also, that intermittent filtration has been unjustly tested by the ordinary rules applied to surface irrigation, the principles of which are based upon a very different treatment. The author in his introduction, classifies the towns and villages according to the nature of their outfalls, and while he shows that sea-board towns may, after some cleansing process, reasonably discharge their sewage direct into the sea, towns situated on estuaries and tidal rivers, and inland towns generally, can only effectually get rid of their sewage, having regard at the same time to the standard of purity suggested by the Rivers Pollution Commissioners, by having recourse to surface irrigation, or intermittent filtration. No doubt it will be said that towns so located cannot always command the area of land suitable for this treatment, and that some mode of chemical precipitation is necessary. Yet it may be affirmed from experience, chemical processes have neither been remunerative, nor altogether successful as a purifying means. Respecting drainage, we need only mention the case cited by Mr. Denton, of the unfortunate site selected at East Moulsey for the Lower Thames Valley sewage, the disadvantages of which are pointed out.

Replying to the objections urged by some to intermittent filtration, such as the clogging of the soil, and its consequent loss of absorbing capacity, the nuisance arising from a limited area being so treated, and the cost of preparing land for the process, Mr. Denton instances the case of Merthyr Tydvil, which was the first experiment made to show that these objections are not valid. Instead of taking one acre of suitable soil, drained 6ft. deep, to cleanse the sewage of 3,300 persons, as suggested by the Rivers Pollution Commissioners, three acres were taken to do the same duty, and the sewage was distributed by furrows; so that the doubts entertained by the commissioners were met. Later experience seems to have shown that the anticipations formed by Dr. Frankland and others were well founded, and that as regards the quantity of land required to insure economical results, it was a simple matter of the quality of the soil, its capability of absorbing the sewage at stated intervals, and of retaining its oxidising power. It has been found, indeed, that free porous soils cannot be overcharged with liquid. Mr. Denton says "If we avoid the denser clays as altogether unsuitable (unless they are so altered by mixing, burning, &c., as to lose their natural character), and regulate the application of the sewage to other soils, within the limits of 1,000 persons to the acre of those most suitably constituted, and 250 persons to the acre to those least suitably constituted; all other descriptions of cultivatable land may be made capable of filtration, and the advantage of being able permanently to cleanse the sewage of a district where any land, more or less suitable, is to be purchased or leased in sufficient quantity to meet these limits, cannot be overestimated."

Passing over a few useful sections dealing with the amount and value of sewage, solid matters, and sludge, temperature of sewage, storm overflows, and suitable soils, we come to numerous instances of application. The Merthyr Tydvil works, and the results, are described in some detail, and the author quotes figures and facts to prove that much that has been said about that noted case does not bear investigation. At Kendal, in Westmoreland, the author has applied the same system successfully, though, instead of limiting the sewage of 1,000 persons to an acre, the Council used only one-third the land recommended, which, of course, has unfairly tried the process. At Forfar, in Scotland, the process has been applied in combination with surface irrigation, and the receipts of the farm produce speak for themselves. At Great Malvern, surface irrigation and intermittent filtration have also been successfully combined. Halstead, Essex; Barnsley, Yorkshire; Hitchin, Oakham, and the Convalescent Hospital, Walton, Surrey, are among the other instances cited, and they afford convincing proofs that, even under unfavourable circumstances, intermittent filtration can be used with decided advantages, and that clogging of the soil has not been proved. The plans and estimates of the farms given, and the experiences and notes recorded at the end of Mr. Denton's book are valuable, and deserve study.

* Ten Years' Experience in Works of Intermittent Downward Filtration, separately, and in combination with Surface Irrigation. By J. Bailey Denton. E. and F. N. Spon, Charing-cross, London.

ARCHITECTURAL ASSOCIATION.

AN ordinary general meeting of the Association was held on Friday evening, the President, Mr. E. C. Lee, in the chair. Messrs. H. B. Thorpe, J. L. Kingham, G. Maides, J. Holdgate, W. J. Hilton, J. U. Quick, T. W. Abbott, R. Donaldson Hawes, and F.

Slaiter were admitted as members. Mr. Eales proposed a vote of thanks to Mr. T. Roger Smith for meeting the members at the Consumptive Hospital, Hampstead, and explaining its details of construction, and announced that the next visit would take place on Saturday, the 26th inst. (to-morrow), when the members would assemble at 3 p.m. in the new board schools on the Queen's-park Estate, Harrow-road.

THE ASSOCIATION'S EXCURSION TO LOMBARDY.

Mr. E. J. Tarver read a paper descriptive of the excursion to Lombardy, conducted last autumn by Mr. Hugh Stannus. The lecture was cast in diary form, and was avowedly of a general and gossipping character, the author suggesting that details could be filled in by other members of the party. A number of drawings, including plans, elevations and measured details of the principal churches, rubbings from monuments, and full-sized details were hung round the rooms. These illustrations represented the joint work of the members, executed under the supervision of Mr. Stannus, and subsequently arranged and pieced together by him; they were supplemented by drawings lent by Mr. Hilton Nash and others, and by photographs, the whole forming a very interesting exhibition of Italian Renaissance architecture. The party, Mr. Tarver mentioned, consisted of twelve members, and the route taken was viâ Calais, Paris, and the Mont Cenis Tunnel to Turin, that city being reached on Saturday, the 18th September last. The low pitch of the roofs and the overhanging eaves, together with the intensity of colours, and the clearness of the shadows, at once reminded the party that they were on the southern side of the Alps. It was commonly asserted that the alterations of roof pitch as one went south was a question of turning off rain; but as there were driving rains in Italy, he thought the reason was rather that with a flat pitch it was easier and more economical to obtain the large projection of eaves which alone made street-life, in the heat of the day, endurable, and this accounted for the covered arcades in the principal streets. A visit was paid to the new Jewish Synagogue, with its enormous coved and truncated roof, square on plan, and its numerous superposed orders of columns; the effect was rather "spindly." In the afternoon they went on to Milan. A grand central feature of the town was the Gallerie Vittorio Emmanuele, a gigantic promenade roofed with glass at a height of about 80ft., and containing the fashionable shops and restaurants; its architect, Mengone, like our Bassevi, met his death by a fall from the roof. The lecturer suggested that our Trafalgar-square might with advantage be covered in and treated in similar fashion. The Palazzo Municipale was, according to Mr. Stannus, correct in its proportions and details, and its cornice exhibited a feature peculiar to Milanese work; but Mr. Tarver thought it monotonous. If anything could have given Milan Cathedral a chance of looking well it should be moonlight; but although they selected that for a first view, it seemed to the visitors frivolous and wedding-cake-like externally; inside, as seen next day, the huge pillars in a long cross-row gave an Egyptian effect. In the church of Santa Maria presso San Celso, they first saw some of Bramante's work. It has an apsidal east end with ambulatory, the planning being as irregular as any Northern Gothic work, but the result classically quiet and steady. As seen during the excursion, Bramante seemed to have treated Renaissance architecture with just the proper amount of playful freedom and no more, and to have always worked within his power. Alberti's work appeared, in comparison, quite "stodgy," and that of later men, with their twists and curves, both in elevation and plan, quite licentious. In Italian domes, the great feature was the management of the piers. A dome of large size could not stand comfortably on square piers; on the other hand, an octagon of equal piers and voids produced a very tame result, and it was interesting to observe the stages between these extremes. In our own St. Paul's Cathedral, he thought the effect was marred by the segmental arches alternating with the four great semicircular arches. In the gorgeous church of San Alessandro, Milan, he roughly noted the plan, which was at once powerful and interesting, but had apparently never been published. Its principle seemed to be that, having settled the diameter of the great dome, the faces of piers were drawn from the points where diagonal lines touched this diameter. Two large columns—one circular, the next square—gave extra stiffness to the piers, and carried the four great semicircular arches; but all the rest of the church followed either the diameter of great dome, or the width between these diagonal points. These piers gave just the right amount of support, and the pendentives came together comfortably at the springing line. The great dome was raised on a drum, and was further helped by a second impost on springing mouldings above the main cornice, which would otherwise have concealed too much of the arches as seen from below. The interval of rest given by the barrel-vaults, the subordination of the flat dome over the choir, and the still further subordination of small side domes, and their surrounding barrel-vaults, produced an ever-varying and picturesque composition. The terra-cotta treatment of the Ospedal Maggoire had been often illustrated. No Northern architect would have designed the windows with head and jambs surrounded by an unbroken border of ornament; he would, perhaps rightly, have emphasised the spring of the arch with a capital or other break. The plan of this hospital was a central courtyard, with four smaller courtyards on each side, the enormous wards forming the division between the nine courts. On the following day, Mr. Stannus piped all hands to measure the cleverly-planned church of San Satiro, the drawings being subsequently put together under his direction. At mid-day they took train for the well-known Certosa, a monastery of the Carthusians, now under the charge of the Italian Government. In the buildings space had been economised in a complete manner, but without producing a sense of cramping. The church was partly under repair, so that they were unable to examine some portion. The whole was so rich as to baffle description. As an architectural composition, the nave front was shocking; but one could revel in examination of its every detail. The best features of the choir were the backs of the stalls, ornamented with wood inlay, said to have been designed by Borgognone. At Pavia, the next town visited, the party found themselves amongst Mediæval arcaded streets and market-places, and close to their hotel, an enormous octagonal building was in course of erection; it was to be a covered promenade, but would make a respectable domed church. The unfinished cathedral of Pavia, designed by Bramante, was most instructive. A wooden model of the completed church and engravings showed what a stupendous effort it was; but he thought the treatment of alternate arches of the dome, carried up a stage higher than usual, would produce a weak effect. The top stage of the tower exhibited Bramante's restraint. The Church of S. Theodore contained some fine frescoes on the north and south walls of the transept. The former was divided into twelve squares, containing representations of the patron saint's life, and at the bottom, one long panel with a row of figures under a continuous canopy and figures at a table in the centre—an arrangement binding the whole series well together. Those on the south side represented the life of St. Agnes, and were far finer, the only fault being that the drawing was a little too formal. The church of San Michele was an unusually rich example of the Lombardic style. At the water-girt and ague-haunted town of Mantua they visited first the large church of San Andrea, one of Alberti's designs, and rigidly clean-cut and proper in its lines. The desecrated church of San Sebastian has an external staircase with a double arcade of exquisitely refined character. The Ducal Palace Thé consisted of a series of rooms designed and painted by Giulio Romano; one had full-sized figures of horses on the walls, and marvellously foreshortened figures on the ceiling, tier above tier; a third had walls and ceiling in one continuous unbroken surface, painted with the Fall of the Giants. The next day was one of hard work at Verona, a route having been strictly arranged by Mr. Stannus, embracing all the important buildings. They began with the outlying 12th-century church of S. Zenone, one to which the mind gratefully reverted through the daze of all the Renaissance work seen during the trip. At San Bernardino there was a circular baptistery, the Capella Pellegrini, by San Micheli; but it was very inferior to Bramante's baptistery at San Satiro, Milan. The cathedral was also a Mediæval church of the 12th or 14th centuries. The church of San Giorgia, on the other side of the river, was an oppressively grand design; it contained a large altar-piece by Paul Veronese, representing the martyrdom of St. George. At Sta. Maria in Organo was much inlaid woodwork in the choir, but although ingenious, it represented only inanimate objects, and was not to be compared with that at the Certosa. They obtained leave to visit also a very early chapel, excavated in a hillside, and decorated with contemporary frescoes; another church, S. Fermo Maggiore, was interesting for its single-span roof and its pulpit. He was disappointed with the Scaliger tombs, and were it not for the Gothic mania no one would have been excited by them. Last of all they visited the Roman arena, which transported the members into quite another world from Verona. Friday, Sept. 24th, was the last day, and on it they were to fulfil at Brescia one of the chief purposes of the excursion—to secure a monograph of the Church of Sta. Maria de Miracoli. Before attempting this the members visited the two cathedrals, new and old, standing side by side, and connected by a passage. The new one is on an enormous and costly scale. The old cathedral was a circular church of the 12th century, on a 9th-century crypt. The Palazzo Municipale was an unfinished building, and was designed by Bramante, begun by Fomentone, the second story carried out by Sansovino, and added to by Palladio, there still being an opening for a modern architect in the completion of the octagonal top story. The afternoon was well spent in the measuring up and drawing the Miracoli, and in the evening the party broke up, some going to Venice, and others returning by the St. Simplon and Gothard routes for Paris—all that he could answer for being his own return to England at the time laid down in the prospectus, and within the expense that Mr. Stannus had named.

Mr. G. Crickmay, jun., of Weymouth, read a supplemental paper, describing the trip to Venice undertaken by a few of the party, in which he dwelt upon the peculiar character of Venetian Gothic and Renaissance, and upon the beauty of their colour decorations, and suggested that the Association should arrange for a special excursion to this most interesting city.

The President, in inviting discussion, remarked upon the value to young architects of excursions into Italy for purposes of study and comparison of actual buildings.

Mr. Longden, one of the members of the party, said he was struck with the free and bold use of colour in external decoration, but thought it was only permissible in the brilliant sunlight of Italy. The ironwork was differently applied to that which we were accustomed, but was excellent in its details; in Lombardy flat strips of iron were largely used for ornament, in combination with square pieces and bars. A typical example was that surrounding the tombs of the Scaligers. In several churches, as at the Certosa and S. Maria del Organo, they saw wood used as an inlay. He passed high encomiums on Mr. Stannus for the excellent manner in which he arranged and carried out the excursion.

Mr. Gill also referred to the varied use of colour decoration seen in Lombardy, as in the frescoes at Brescia; the blue, red, and yellow used there appeared grey in the shade and at a short distance. Much of the Rococo decoration added to earlier churches, as at San Michele, Brescia, was very bad. In Bramante's unfinished Cathedral at Pavia they saw that the nave triforium had been continued in monochrome over the flat wall surfaces of the unfinished transepts.

Mr. Stannus explained that his object in planning the excursion was to show the students the beauties of Renaissance work as carried out in Italy, and that Gothic was not the only available style, and he thought it had not been an unsuccessful effort. He described the mode in which the measured drawings and plans were executed by a combination, and added that it had not yet been decided whether the results, with some additional notes, should be published in a separate form or in one of the architectural journals. He threw out the suggestion to the members that in future the Association excursion, instead of being confined to our own country, should be in alternate years extended to the Continent, the intervening year being devoted as now to an outing in England.

Mr. R. P. Spiers seconded the vote of thanks to the readers of the papers, which had been proposed by the last speaker, and added to it the name of Mr. Stannus for having inaugurated and organised the excursion, and thus amplified, the motion was carried by acclamation.

THE STUDY AND PRACTICE OF THE ART OF ARCHITECTURE.*

(*Concluded from page* 174.)

THERE is no subject for study more important than the relation of carved ornament to architecture. You know how in all times it has formed a leading feature. The repetition of definite ornaments at regular intervals is one of the easiest modes of securing due attention to the member on which it occurs. The moulding adorned with carving is always more noticed than any other, and the lines which require special emphasis are those to which such work ought to be confined. You will soon find that these carvings, as well as the mouldings, are modified to suit their positions, near or at a distance from the eye. You will notice also certain contrasts between the ornament in good and bad work. In the former it is never aggressive or too prominent; in the latter it is almost always so. In the former it is used with due deference to the common sense of construction; in the latter it disregards the construction entirely. I cannot give you a better example of this than is afforded by the division of such an enrichment as the so-called dog-tooth flower. In good work this is always divided to suit the joints of the stonework; in bad work it is set out with absolute uniformity all round an arch without any reference to the joints, which thus, instead of coming always between the flowers, occur in the worst possible places. I mention these points because, if you once notice them for yourselves, you will see how important they are, and how certainly they indicate the quality of the work in which they are found. As there is no sort of training for an architect equal to that of the study of buildings, so it is absolutely impossible for you to learn your art only from the lessons which are able to teach you here, or which you learn in the routine of architects' practice. At all costs, then, you must spend a certain proportion of every year in travelling and examining buildings for yourselves, and the only special advice I can give you now is, not to try to cover too much ground at first. It is wiser to study a few good works well, and to make yourselves thoroughly masters of them. Having done this for some time you will find your power of seizing the best points in the buildings you visit increase rapidly, and you may then make your journeys more rapid and less exhaustive and particular. These very general suggestions may seem almost unnecessary; but unfortunately I know from experience how few of us spend enough time in sketching and measuring existing works; and how few manage to make clean, clear, decided sketches of what they see. Observe that it is generally impossible to improve a sketch after it is once made; whatever it is, pray leave it with all its first freshness about it. There is a virtue in that which will never be increased by after-work. If you have any feeling of the artist in your composition it will be impossible for you to go on for long drawing the good work of other men or other times without gradually finding yourselves distinguishing clearly between good, inferior, and bad work. In this country it so happens that you all have, within reach, examples of a national architecture perhaps as noble, and certainly as universal in its developments, as that of any other land. Some of you, as you pass through our schools, give painful evidence of the fact that you wholly ignore this great,—indeed, untold,—advantage. Compare your own chances of education with that of the student whose fate has ordained that he shall learn all that he knows in new countries, where not a fragment remains of an older art than that of his own time, and you will see how immense your advantages are compared to his, and how far in advance of him you ought to be in real taste and culture. But I am told, sometimes, that you have no time, no opportunity, no means to avail yourselves of your advantages; and when I ask one who excuses himself in this way whether he has drawn much of Westminster Abbey, or of the cathedral nearest to the town from which he comes, I find that he has deferred this duty to some future day, or that he thinks the advice too impossible to be practicable. Others among you, too, may believe what you are often told, that what you should aim at is an original style, and that the constant study of already executed work is not likely to assist you in this. Well, this is too long a question for this evening; but if the nineteenth century is to distinguish itself by not caring for all that has gone before, I can only say that it will distinguish itself in a quite unique fashion. I shall have to speak to you more at length on this point in my third lecture, and need, therefore, only say here that we know of no period in our art in which architects were not studying the work of men who had gone before. They studied them wisely, so that they might improve them. The variations which they made were sometimes so slight and so slowly made as hardly to amount to variation at all, and if there ever was a people more prone to such a course than another it was that Greek nation to whose art we all look up as among the most inspired results of the highest training. I would never have you draw and sketch existing examples with a view to copying or reproducing them. That is wholly contrary to right principles. What I wish is that you should draw so much of them as to find yourselves penetrated with the feeling for architectural form and perfection which as the results of centuries of development have been discovered to be the best. This study is, in truth, analogous to that of the sculptor, as illustrated by the exquisite work of that great man (Flaxman) which just now you have an opportunity of studying within these walls. You see him drawing from the life until he has mastered all the motions and attitudes, outlines and muscles of the human form. Then possessed to the full of this knowledge, he lavishes his poetical spirit on combinations of figures, which illustrate at every turn his power, his knowledge, and the perfection of his sentiment. The commonest subject in his hands becomes endued with a beauty and a grace which are so natural as to seem inherent. What the human form was to him, the complete study of the accumulated experience of ages in existing buildings is to you. And you are to use them not that you may steal from them, but that you may be able to deal with the problems that come before you with the same spirit and power that they show, whilst you avoid with care the failures and mistakes which you can discover in them. You may well ask me here how far such a due study of ancient examples as I have been advising must be carried in the direction of purely archæological inquiries; and I think some advice on this point will not be thrown away. It is quite true that archæology is not architecture; but one-half at least of the studies of any architect who cares for anything beyond the work of his own hands has its antiquarian side; and what is important is, that this alternative side to your studies, far from diminishing your interest in them, is sure to enhance them. In the history of the development of styles, you have matter for endless interest. The buildings you admire and examine are the work of men of whom you know nothing, and who lived ages ago, perhaps. Unless you can put them in their proper places in relation to each other, in their proper sequence, you will never be able to understand their gradual developments; and accurate knowledge on such a point is, beyond everything, useful to men who have any hope of making any further developments in their art. There is a fruitful sort of antiquarianism, and a dry and fruitless sort; and it is with the former only that I care to advise you to interest yourselves. You may well leave the rest to the men who are antiquaries and nothing else, and with whom art counts for no more than antiquity. But you cannot leave to them those analyses of the progress of art in each man's work, from one man and one age to another, or from one country to another, without most serious loss to yourselves. I know nothing more useful than such studies and such acomplishments as these. They will prevent your being drawn into the downward current which sets strongly in the direction of business as against art; for the man who has once devoted himself to them will never lose that interest in the higher developments of his art which it ought to be, above all, your ambition to have and maintain. There is much more to be said as to the direction your studies should take; but before I touch on this I must get you, if I can, to realise that you must devote some at least of your time to the sister arts of painting and sculpture; and this not with any idea of excelling in the practice of all the arts,—that is a happiness reserved for a few heaven-born and greatly-gifted mortals! But rather with the thought that unless you know enough about other arts to be convinced of their highest developments in connection with architecture, you will be like so many of your predecessors, unable or unwilling to recognise that in the harmonious combination of all the arts is the greatest future for each of them separately; and it is from among the ranks of you who are now growing up that we hope the men will come who will have the happiness of seeing what will really be a resurrection of art in this land. The practical divorce of the arts has ended in the gravest loss to all. The architect has become too much of a mere builder; the painter lives to make pictures to be lived with and loved by a few, instead of the many; and the sculptor's life is too often spent on work for which he cannot care much, because it is of no general interest, men having too often forgotten that his work is beyond all other that which completes and beautifies and ennobles the work of the architect. On some other occasion I shall hope to be able to speak to some of you at length on this point, for I am persuaded that there is nothing by which both arts will gain so much as by the more frequent combination of the two. For your own share in such a consummation in the future, you will not find so much opportunity for study in England as elsewhere, but you should lose no opportunity of familiarising yourselves with examples of mural decoration, whether by sculpture or painting, in books, of which, as you know, we have access to a goodly store in the library of this Academy; and for acquainting yourselves with sculpture, there is nothing more to be desired than that you should give up some of your time to drawing and modelling from ancient examples, a very large proportion of the finest works of all times being the sculptured decorations of buildings of the Classical, and Mediæval, and the Early Renaissance schools. No small advantage will those gain who devote some of their time to learning to model. In my opinion, all the decorative sculpture or carving in a building ought to be modelled in the first instance by the architect. This is the only way in which that harmony throughout the work can be secured which is essential to good effect. It is impossible to direct another man properly merely by giving drawings for such work, and you must learn to give your instructions in the round. The day, I hope, may not be far distant when all sculptors will agree with me—if, indeed, they do not so already—in thinking that the best of their work would be even better than before if it showed a thorough appreciation of, and fitness for, the requirements of the building in which it is placed. I know nothing more fascinating than the evidence in most ancient work of the same feeling as to detail being common to the architect and the sculptor. You do not see where the work of one ends and of the other begins. The sculptor seems to know all about architecture and the architect to be quite conversant with sculpture; and I much wish that in the architectural school here we occasionally, or even, I may say, regularly, found some students of sculpture laying aside their modelling tools and their chisels, and coming to us for some instruction in the art, a good knowledge of which is essential to their own complete success. In future lectures in this course I shall have repeatedly to refer to the works of sculptors and architects, in which it is difficult to say which of the two arts can most rightly claim the artist. But if this is again to be the case, the young sculptor must understand that he has to master something more than the rudiments of architectural styles, and that, when he condescends to think of work which is half architectural and half sculptural, it must be with a complete sense of the equality of the two arts, if his work is to live with that of the great masters of all old and true schools. If the sculptor ought to learn so much of architecture, how far ought the architect to go in the study of the human figure? It is a question surrounded with difficulty. A great building may be built which shall not include any representation of the human figure. Either by accident or by robbery of their sculpture, some buildings which once had figure sculpture have none now, and yet are hardly less evidently beautiful in their effect. The practical difficulty about drawing

* Lectures on Architecture to Students of the Royal Academy. By George Edmund Street, R.A. No. 1: delivered Monday, Feb. 14, 1881.

from the life is that if it is carried a very little way it is of no service, whilst if it is persevered in very far it is almost certain to be at the expense of other accomplishments which are even more essential, and there is a risk that the student may end by being both a bad figure-painter and a worse architect than he would otherwise have been. It is only, therefore, in those very rare cases in which an architectural student feels a complete conviction that he has the unusual and rarely-given power of combining the two arts that he should venture to avail himself to any great extent of the privilege which is conceded to him in this Academy, though he should never lose any opportunity of studying the history of the combination of painting with architecture, and of making himself fairly learned in the theory of such work. This he may do, whether he can draw the human figure or not, and unless he has done it he will never be able to associate himself with a painter in counsels as to the completion of his own work. In addition to improving your skill as artists, on which I have been saying so much, you are bound to spend a great deal of time on other studies, without which you can hardly hope to rise to real eminence. There is, first of all, a long course of practical study, which will show its results in your work with certainty. All the visitors of our Architectural School feel, I am sure, as I do, that there is much to be improved in this respect in the work of the majority of the students. You ought never to make serious mistakes about simple matters of construction, or simple details of arrangement. Many of them are the result simply of a want of a little common sense, than which there is no quality that an artist of any sort ought more sedulously to cultivate, and the architect most of all. And as, perhaps, it is when you make a ground-plan that this failure is most evident, a few words on this, which is the foundation of all good architectural work, will not be out of place. In making a plan there are two things to consider; first, the convenience of the building for its purpose; and next, its suitability for its position. All good artists welcome with pleasure what is called a difficult site. In truth, there is no site so easy to deal with. It is when the site has no marked features of its own that the architect must make those of his own work predominant. The Acropolis of Athens and the Forum Romanum of Rome are, in one sense, difficult sites. That is, they are so picturesque, so irregular in their levels, that everything has to grow out of the necessities of its situation. There are no lessons more useful than those which you may learn from such examples as these. The Greek added one building to another in an almost picturesque confusion, and in a mode in which, if we believed some of our teachers of a few years back, it is impossible for any but the most erratic Gothic architect to take any pleasure. The Roman made a winding and irregular descent from the Capitol, with buildings of wholly dissimilar style on either hand, as he descended, and then when he had passed through the arch of Septimus Severus, and found himself in face of a straight road for a short distance, he took care that it should be occupied by a succession of irregularly-placed and designed columns, monumental pedestals, and buildings, whose beauty was that which came from the individual character of each, as well as from the gradual growth of the whole, and the evidence it afforded of the historical continuity of the community and its arts. Nor when the Forum was left behind, and but a short distance separated the Romans from the Colisseum, was there any care to secure a straight road from one to the other. The paved roadway meandered on under the arch of Titus, suiting itself to whatever conditions existed in the easiest fashion possible, and without any thought whatever of those necessities for formal setting out of cities which are only reasonable when, as in many Transatlantic examples, there is no history whatever to be recorded, and a whole town is laid out at one time, and completed almost as soon as laid out. There are cases in which, however, the wise architect endeavours not only to build to suit his site, but to make the peculiarities of his site suit some sumptuous and scenic laying out of his whole building. Time will not admit, however, to give more than a passing reference to a subject, which in itself affords materials for many a lecture. Nor is it at the outset of your life that you are likely to have such opportunities as would enable you to realise the advantages of the study. I have told you that you must study convenience of plan. This you may do, not to the exclusion of architectural effect and character, but always with a strict eye to it. In designing the plan of a house, for instance, it does not do to make the external design first and then to make the interior fit it somehow or other. It is necessary to keep both in your mind, but it is the interior that ought to be supreme. The best exterior in the world would not atone for a faulty internal plan. And observe that a good interior is not simply one planned upon some everyday scheme, and one in which life does not simply go on smoothly and without hindrance, but one which has so much suggestiveness and special adaptation as to make it in every way an interesting one to live in or to use. To accomplish this you must realise how every part is to be used, and so contrive as to give every one pleasure in using it. It is this harmonious and reasonable variation of plan that gives the greatest value and charm not only to the interior, but, as a natural consequence, to the exterior also. The same rule applies to all other buildings. If they are well contrived for their special use, depend upon it you will be just as well able to make their elevations good as if they are carelessly contrived. A church requires by custom, by law, or by sentiment, a generally similar arrangement of the plan. At least, it requires the same component parts—a nave, a chancel, a porch, a steeple, a vestry. How differently may not these be grouped and designed! The variations in the provision for the given wants in this case are, as you know, innumerable. And how much more various may not the plans for a house be? If you realise that the real value of architecture, as of all the arts, is its human and personal interest, you will see how impossible it is that any art can be worth anything in which this is wholly ignored. The only justification of endless rows and groups of houses, all arranged on the same lines down to the pattern of the scraper and the design of the area-railings, or of the balconies, is that the people who are to inhabit them are so identical in all their wants, wishes, and modes of life, that one pattern of house will do for all. Fortunately this is no more true of this age than of past ages. And now, as then, the best-planned buildings will be those which take account of the existence of a diversity of men, with endless varieties of tastes, and wants, and circumstances. It is here that the study of ancient art is so invaluable. In former days, with much less facility for intercourse and movement, we see how many are the adaptations which architects had to make when they went from one part of Europe to another. In our own time this is of every-day occurrence. An English architect may be called on at any time, at the very outset of his career, to go to some foreign dependency where every condition of life and climate are wholly different from what they are in England. The plans as well as the architectural forms which are suitable in England are wholly out of place in a tropical country. In one, just as much as in the other, the same first principles may have to be observed, but the resulting forms will be wholly dissimilar; and the man who begins life with some knowledge of how such differences have been successfully dealt with before, has an untold advantage over the man who treats all countries and all climates alike, as if the satisfaction of local requirements were not, in truth, the very first condition of a good piece of architecture. Before I conclude, there are two points only on which I must say a few words. One is the necessity for study of much which we cannot teach you here, and which you will never learn in the workshop of an architect. Such, for instance, is the study of language and the study of books. I cannot too strongly insist on the former. Without a knowledge of modern languages you cannot travel with complete pleasure, and you cannot know anything of the largest half of the literature of your art; and unless you have travelled, and unless you have read a good deal of what architects and critics in other countries teach and think, you have deliberately shut yourselves out from a large portion of the education which is indispensable to an accomplished architect. As students, you have access in this academy to a most admirable artistic library, year by year becoming more and more complete, and where you may do more to cultivate your own taste by acquaintance with the best examples of all times than I can do for you by any number of lectures or addresses. And, in the second place, I wish to say but a few words on the way in which you avail yourselves of the instruction offered you in the schools. I have no desire whatever to exaggerate its importance. Most of you, I hope, are at work day after day on the drawings and designs of the architects under whom you are studying. Nothing is a better training than such work as this. If you have given you the original drawing—be it general design, or detail of a part at large—and are condemned to complete it either by putting his pencil lines into ink, or by the slower process of copying it, you are learning in the best way all that he can teach you. But you are in one groove, and affected only by one mind; and by coming here you find yourselves brought face to face with new ideas and views, inasmuch as you have to work under the direction of the visitors assisted by the master. But, to make any good use of such opportunities, it is not enough to come here occasionally, and only and so often as is absolutely necessary, but with regularity, punctuality, and preparedness. The one regret that I feel in connection with our architectural school is that the students do not, as a rule, appear to wish to attend once more than is absolutely necessary, and when one sees anything short of the highest zeal, one is led to anticipate something very far short of the highest success. It is this absence of enthusiasm for his work which is fatal to an artist. If you have it you will think no hours too long for work, and labour, instead of being toilsome, will be your greatest pleasure. Unless you have enthusiasm for your art yourselves, how can you expect that others will have any to spare for you and your work? It is a contagious quality. The artist who really has it does his work in such a way as to make others feel for him what he feels for his own work. This is seldom, if ever, worthy of love and admiration, unless it is the outcome of a zeal and a fire which are real and intense. If we have such a zeal, how will it show itself on our works? This is a question which affects what is called the practice of our art as distinguished from the study. I have left myself scant time to speak on this part of my subject, but fortunately there is not much to be said. In art a man who has zeal must almost of necessity have more zeal for some of its forms than for others. The forms which our art has taken are styles in which it is almost impossible for any artist to take an equal interest. And a man who is really an artist will find it natural to practice in one style, impossible to do so in another. Modern practice has tried to convert the world to an opposite view; it has assumed that an architect can design equally well in any style. Of course, if this were true, there would be no art in the work, for an artist must show himself in his work, and it would be impossible to do this in antagonistic things. It is not, in my judgment, necessary or desirable that I should pronounce positively to you as to which is the best form for the architecture of the present day. That, when you have studied and thought, and worked for a few more years, each of you will have to decide himself. But this I can tell you, that if you have zeal enough and enthusiasm to care for your art for Art's sake, you are far more sure of success by adhering strictly to what you believe to be good, true, honest, and artistic work, than if you attempt to please everybody by doing whatever you are asked to do in whatever style or fashion may be dictated. The man who knows how to do one thing well is more certain of success than he who tries to know a little of everything, and in study and in practice common sense and good art both claim from you that you should at any rate know the style of your own choice well. Beyond all doubt it is a sort of inspiration that is required in the artist who is ever to do any really great work, and this will never come to one who never dreams of perfection, who thinks first of all of gain and worldly interest, who treats his art as a mere matter of business and routine, not as an imperious mistress who must have all his devotion and all his heart. To secure this enthusiasm you must be dreamers in one way only—you may give reins to your imagination—you may dream of beauty, of majesty, of perfection—you may picture to yourself what you would and will accomplish; but you must be no dreamers about your proper work. That must be constant, steady

in purpose, thoughtful, and always in some way bearing on your art either directly or indirectly. The more time you devote to study the more will you become engrossed in your art, and the more you will find that it is delightful and interesting in all its changes and developments of old, and in the practical application of what you learn from these to the art of your own time. Industry alone will not make a great artist: but if there is one thing more certain than another in art, it is that all great artists have been industrious, and that if you wish to be numbered in their results you must follow their example.

ST. PETER'S AND ST. PAUL'S CATHEDRALS COMPARED.

MR. SOMERS CLARKE, JUN., read a paper on "St. Peter's and St. Paul's" before St. Paul's Ecclesiological Society on Thursday, the 17th inst. A building was to be accounted an example of good or bad architecture, the lecturer reminded his hearers, in proportion to its adaptability to its purpose, suitability of design to materials of construction, and its accordance with the laws of Nature; its style was but a question of grammar, and mattered little so long as the ideas were clearly expressed. Those learned in architectural grammar found that the west-front of St. Paul's was full of blunders, details badly applied, and quite contrary to rule; the portico was deficient in projection, two orders were superposed, the columns were doubled and were wrongly spaced; yet all felt, on looking at the front, that it was but scant praise to call it "the most pleasing design of its class that had yet been executed." But in the chief front of St. Peter's (called for convenience the west-end, but really facing east) the dimensions were colossal; the balustrade surmounting the front rose far higher than the western towers of our own church, whilst the width was nearly double. The grammatical blunders, although many, were not so numerous as at St. Paul's. Yet, in effect, St. Peter's was as huge a failure as St. Paul's was a triumphant success. The beauty of St. Paul's did not rest on the correct application of the Classic styles, but upon outline, massing of parts, contrast between the spiring form of the western towers and the vast shell of the dome, and the placing of these in just relation to one another. The lecturer sketched the history of the rebuilding of St. Peter's, from 1450 to its structural completion. The plan was recast, and the prodigious dome was conceived and originated by Bramante, the architect, from 1503 to 1510; he was followed by Raffaelle and F. A. Gioconde, who elongated the nave to about its present length. Antonio de San Gallo succeeded in 1517, and proposed developments of the design, by which it would have been made much superior to the present building. Peruggi, the next architect, readopted the Greek cross of Bramante, and introduced great retrenchments, cutting down the scheme. Antonio de San Gallo the younger added to his Greek cross a vestibule, and a vast façade, running north and south; his original design, still preserved, showing much which seemed to have suggested to Wren what was called his favourite design for St. Paul's, but with the essential difference that Wren's dome was to stand on eight piers, whilst San Gallo's dome had four piers already constructed. Michael Angelo, 1546-64, cut down San Gallo's plan, which had only been partly completed, ruthlessly; he gave up the vestibule, struck out all aisles and side-chapels, and reduced the scheme to extreme simplicity. With beautiful detail the vastness of the dimensions would have made his interior impressive, although not equal to Bramante's or the younger San Gallo's designs; but Michael Angelo did his best to destroy any grandeur of effect by the huge and vulgar details adopted. The Greek cross was now completed, the substructure of the dome partly reared, and shortly after Michael Angelo's death, roofed in. In the 17th century the existing nave was added by Carlo Maderna. Granted, that this elongation had diminished the appearance of concentration of effect on the dome, what was it made the interior of St. Peter's so disappointing? It seemed utterly devoid of human interest, frigid, and unsympathetic; it was more crushing than the interior of St. Paul's, yet all would admit that the proportion of the dome and its surrounding parts to one another was far superior to that of Wren's masterpiece. Mr. E. A. Freeman had shown that the disappointment universally felt in first entering St. Peter's was due to the blunder of the architects in adopting the magnifying in place of the multiplying principle, the individual arches and other features being enlarged instead of introducing a number of features of the same kind. St. Paul's in re-erection passed through no such vicissitudes as the fellow-church, and we were able to follow the gradual growth of the scheme from the drawings left by Sir Christopher Wren. Before the Great Fire Wren was called in to repair Old St. Paul's, and he then proposed to use the old cruciform plan, but "to cut off the inner corners of the cross, making a dome in the middle, after a good Roman manner." Wren was closely connected with Ely, where this very scheme had been adopted in the 14th century. When the Great Fire of 1666 ruined the old cathedral, Wren showed himself desirous to throw over all Gothic traditions, and although he had never been to Rome, yet he produced a design which, on comparison, is shown, both on plan and elevation, to bear strong affinity to San Gallo the younger's plan for St. Peter's. Fortunately, the clergy insisted on a "cathedral form" being preserved, and the result was a more spacious and convenient building, and a much more effective design than Wren's first proposal. Bramante and San Gallo were largely influenced in their designs by the influence of the gigantic ruins in Rome, erected at a period when art was at a low ebb; the idea of St. Peter's was essentially that of the Basilica of Maxentius, and the Parthenon dome. Again the Roman method had always been to build in brick, faced with thin slabs of marble held on by cramps, and this mode of construction exercised a powerful and not often recognised influence on the design for St. Peter's. Although the external walls of that cathedral were faced with stone, all the rest of the building was of brick. The whole interior was, when first finished, decorated not with marble or solid stone, but with plaster. Those parts near the eye, and that could be touched, were now being gradually cut away and replaced by marble; but from one end of the church to the other not a single leading architectural feature was of that material. Consequently, what would otherwise have been moderate-sized piers or pillars were developed into enormous brick piers, mountains of material. Wren, although aiming at building after "a good Roman manner," was fortunately unacquainted with Roman manners of construction, and we therefore had in St. Paul's a building which was really built of stone within and without and in which all wall-surfaces, decorative features, and carved details were executed in stone. For this reason he thought Mr. Burges, A.R.A., was singularly out of sympathy with St. Paul's, when in his scheme of decoration he proposed to chip away a greater part of its internal surface, and replace it with a marble veneer. St. Peter's was intended so to be treated; St. Paul's was not, for the leading lines were all in solid wrought-stone, and were integral parts of the structure. Turning to the plan of St. Paul's, it would be seen that the long and narrow nave carried out was not so useful as would have been one of greater breadth and less length, and the internal effect of the building, now an unhappy compromise between a long and a domed church, based, the one on a Latin, the other on a Greek cross, would have been improved. It was curious to observe the many coincidences of the plans of New St. Paul's and Ely, yet there was no careless imitation, When having made each point his own. His conception was English Mediæval, covered with a Roman skin not very correct in detail. The economy of material was remarkably seen in the dome, which was quite original, and was, indeed, a perfect masterpiece of scientific construction. Owing to the multiplicity of parts in St. Paul's, its dome, and still more its nave, looked larger than St. Peter's; although the dimensions were much less. In St. Paul's, Wren, regardless of all precedent, introduced an attic story, answering very nearly to the Mediæval triforium, in order to carry the vault of nave. This had been denounced by critics as a shocking grammatical blunder; but as it played a useful part in the construction of the building, this innovation was but one of several instances in which Wren permitted his good sense and imagination to get the better of his rules. In looking eastward the whole effect of St. Peter's was better, because more concentrated than that of St. Paul's. In the latter they had a nave not very wide and of some length, terminating in a vast area, beyond which came what appeared to be a contracted and gloomy passage, rather than a continuation of the nave. To prove that Wren's first proposal of a Greek cross would have been better, they had but to compare the view up the nave with that from either transept-door. Further than this, if the long choir of St. Paul's could be closed, and the altar placed under the eastern arch of the dome area, there would be a great practical benefit, and this, which was nearly akin to one of the proposals of Wren, he threw out as an addition to the many schemes which had been propounded for "completing St. Paul's."

THE BEDDING OF GIRDERS.

IN fixing girders for bridges a good bearing is important, and the size of the templates should be made to distribute the weight upon an area of surface of the pier adequate to the purpose, allowing a good margin. In iron bridges the expansion and contraction of the metal necessitates a means to allow for longitudinal movement at one end. This is effected usually by a series of rollers running upon a bed-plate resting on the pier, and these rollers should be numerous enough to distribute the weight of half the girder and its load. The rollers should be of wrought-iron, about 3in. diameter, and these are fixed so that they are kept at a proper distance apart. The main girder has usually a plate fixed below its end which forms, as it were, an upper bed-plate, and this rests on the rollers. Another necessary precaution is to allow for the tilting action at the ends of a girder which deflects under a load. To provide for this and to insure an even bearing the girder should not be rigidly fixed to the upper bed-plate, but be hollowed out so as to form a kind of rule-joint, thus allowing the end of the girder to tilt, at the same time keeping its position firmly on the rollers.

It is necessary to fix the bottom bed-plate securely to the stone capping or template of the pier, and levers or dovetail bolts should be used, and the bearings upon the rollers ought to be carefully fitted and ground.

CISTERNS.

SOME good advice is given in Mr. Parry's recently published book on "Water: its Composition and Collection," with respect to cisterns. Lead-lined cisterns are better avoided, though they form a large class in the older houses; and it is pointed out that water seldom acts on tarnished lead, though bright new lead is often acted upon by it. It is not so generally known as it ought to be, that zinc is liable to be acted upon, and may produce metallic poisoning. A large number of new cisterns in the smaller houses in the suburbs are zinc-lined, and the fact ought to be noted, though we have not heard of any case in which poisoning from this cause has been proved, or even suspected. Speaking of iron cisterns, the author remarks that "if iron cisterns are used they should receive a coat of boiled linseed oil, carefully applied, before they leave the ironfounders' premises, and before they are painted. A wash of Portland cement affords an excellent protection for iron, if skilfully put on. The iron should receive three coats, and the wash should be renewed every year."

We very much doubt if more than a very small percentage of cisterns are ever cleaned. This neglect arises chiefly, probably, from the inaccessible, awkward positions in which they are frequently placed. How often do we find them fixed close up to the roof as a lean-to, without sufficient space for a man to put his head to look into it, and certainly without space for cleansing. If they are fixed outside, as they often are, they are found without lids, so that any filth or decomposing matter may fall or be thrown in. Any dirty and inconvenient corner appears to be a place for a cistern, and it is time architects paid more attention to a point which they generally leave to chance. In many houses the tenants do not know even where to find the cistern. Good ventilation and sufficient light are two essential conditions to be met in selecting a suitable place, and those who take or buy houses, should, above all, see that there is no connecting pipe or overflow, between the cistern and water-closet or drain.

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ILLUSTRATIONS.

NEW CHURCH OF ST. MARY ABBOTTS, KENSINGTON.—GRAMMAR SCHOOL AT HAMPTON.—DESIGN FOR A CONCRETE HOUSE.—SECOND PREMIATED DESIGN FOR THE GLASGOW MUNICIPAL BUILDINGS.

OUR LITHOGRAPHIC ILLUSTRATIONS.

ST. MARY ABBOTTS CHURCH, KENSINGTON.

To-day our double-page plate illustrates in detail the several stages of the spire and upper part of the tower of this church, both in elevation as well as in section. Last week we published the south elevation with general ground-plan, and also a detail of the west front. Our next illustration of this building will include a general elevation of the tower and spire as completed, with a longitudinal of the entire church. The late Sir Gilbert Scott, R A , was the architect.

HAMPTON GRAMMAR-SCHOOL.

This school, founded A.D. 1556, was reconstituted under a scheme of the Charity Commissioners, dated Nov. 27, 1878, and that enabled the governors, of whom Mr. Alderman Knight is the chairman. to give instructions for the erection of the building of which we give an illustration this week. The foundation-stone was laid by Lord George Hamilton on the 11th day of October, 1879, and the building was occupied in the autumn of last year. It is constructed of red bricks and Bath stone, and provides accommodation for 25 boarders and 125 day-scholars, at 3½ to 4 guineas per term, and care has been taken, in arranging the plan, to admit of further extension ; and already it is in contemplation to erect a school-chapel. The building, including an infirmary in the grounds, was erected at a cost of £6,887, by Mr. S. W. Anes, of the Atlas Building Works, Putney.

DESIGN FOR A CONCRETE HOUSE.

Concrete construction is constantly a subject for debate by all interested in building, and few have done more towards its development than Mr. Lascelles. To-day we publish a design prepared for him by Mr. Ernest Newton, architect, for erection in concrete slabs, tile work and half-timber construction being imitated by the material in question, which is only 1½in. thick, built upon concrete studding ; the chimney-stacks in red brickwork.

GLASGOW MUNICIPAL BUILDINGS COMPETITION.

We illustrate, this week, the design to which, in the late competition, out of 98 submitted, Mr. Barry awarded the second premium of 500 guineas. Messrs. Coe and Robinson, the authors of this design, appear by their report to have adhered very closely to Mr. Carrick's plan, considering, indeed, that the terms of the competition bound them to this course. The report further mentions that in the composition of their design their aim has been to give it (in the terms of the competition) a broad and dignified, rather than a florid character ; and with this in view, they have adopted the pure Classic style, avoiding, as far as possible, any tendency towards the freedom of Renaissance. The design consists of a principal order on a rustic basement, the skyline being broken by one large tower placed over the principal staircase, and rising boldly behind the central mass of the front elevation. In the plans, the large apartment shown in the ground-plan is the telling-room, for receiving gas and water-rates. In the first-floor plan, the large apartment on the left hand at the top is the Town-hall ; those next to it, on the right hand, are the gas and water offices ; on the right hand are shown various offices and committee-rooms. The octagonal chamber at the bottom is the Lord Provost's room, and that to the right of it an ante-room. To the left hand are shown three saloons, and the oval room behind the reception-room and staircase is the council-chamber.

DIMENSIONS OF GIRDER BRIDGES.

At a meeting on Tuesday of the Institution of Civil Engineers, a paper was read "On the Weight and Limiting Dimensions of Girder Bridges," by Mr. M. am Ende, Assoc. M.Inst. C.E. The author treated of a formula for the weight of girder bridges, which he based, to some extent theoretically, upon the strains in the principal or primary parts, viz., the flanges, the vertical web, and the wind-bracing, and to some extent empirically, upon the experimental construction of the secondary parts or bracing. A distinction was made between the theoretical and the practical weight of girders. The former was the weight of an ideal structure, without connections and lateral stiffening ; the latter contained the theoretical weight, together with constants of construction, for the various parts, and an item for secondary bracing in addition. The constants of construction (such as the allowances for rivet-holes and cover-plates) were generally understood, and there was no great variety of practice ; but practice varied greatly with regard to the allowance for secondary bracing. It would be inaccurate to draw conclusions from existing structures as to that item, even for structures of equal size ; but it would be entirely misleading to do the same with regard to structures of much larger size and of different proportions. The author considered it, therefore, requisite to design such structures in order to ascertain the item for secondary bracing over the whole range of practical construction. Omitting smaller structures, in which the secondary bracing was ruled by considerations apart from strict economy, this range extended from spans of 150 feet to 1,500 feet. The designs represented spans of 1,500, 1,000, 750, 500, 255, and 150 feet, the latter two having been executed for the Costa Rica State Railway. The system, common to all, was novel ; and great economic advantages were claimed for it.

The principal features were :—1, a polygonal form of the top flange composed of only five straight or nearly straight members ; 2, in consequence of this form few meshes in the web ; 3, the depth of the girders at 1-10th and 9-10th of the span was equal to one-half of the depth in the centre as characteristic of the form of the girders ; 4th, the depth in the centre was equal to 1-5th and 1-6th of the span ; 5, the widths of the bridges were determined according to a practical formula ; 6, the construction in detail was accomplished almost entirely with rolled bars, plates being used only at the junctions of the principal members. Points 1 to 3 were based upon a calculation of the theoretical weights of a number of forms of girders with a polygonal as well as with a curved top flange, the results being stated on a diagram. Point 4 was based upon results derived from the formula referred to in the latter part of the paper. Point 5 required a formula of a curve which was an asymptote to a straight line of an assumed inclination (here 1 in 30) ; such a curve was an hyperbola. Point 6 was in accordance with the modern style of bridge-building.

From these designs six values for the secondary bracings were derived. If, then, the weight was hypothetically put :—

$$z' \ (D+z'') \ x \ (B+z''')y \ L$$

viz., as a function of the three principal dimensions of the structure, D the depth, B the width, and L the span, five values would be sufficient to determine the five contants. They were found to be the following :—

$$z' = 0\ 007,\ z'' = -10;\ z''' = -6;\ x = y = \tfrac{1}{2}$$

This constituted the empirical part of the problem. Referring again to the theoretical part, a simple system had to be chosen, since a formula was required equally correct for all proportions of span to depth, besides not being too complicated. Such simple systems were the girder with two parallel flanges, and the bow-string girder with a parabola of the 2nd degree. The latter was preferred as having more points of resemblance with the girder of greatest economy than the former. The weight of the ideal structure mentioned above was determined entirely on theoretical grounds, while the necessary additions for the practical weight were derived from the designs, under the assumption that an equal degree of economy could be observed in the practical construction of the bow-string girder. The formula for the weight of the parabolic girder bridge thus completed could be utilised to ascertain not only the limiting spans of such bridges, but also a point of greater importance, viz., the most economic proportion of the depth to the span of the girders. This influence of the depth upon the weight of girders was illustrated by a diagram, which formed the record of a large number of results obtained from the formula. The author was led by it to conclusions which were in perfect harmony with experience and modern practice, viz., that for very large bridges the best proportion of depth to span was from about 1 in 4 to 1 in 5, and for small bridges 1 in 6 to 1 in 8. With a view of applying the formula to other systems, especially to the system of greatest economy, the theoretical weights of various forms of girders were calculated, and the results tabulated on the diagram before referred to. This embraced the parabolic girders of the 2nd, 3rd, 4th, 5th, and ∞ h degree (being necessarily all girders with many meshes in the web), and a number of girders with few meshes in the web, among which was the girder of greatest theoretical economy, and the girder illustrated in the design.

A formula was then given analogous to the formula for the common parabolic girder, but containing as a factor the proportion of the theoretical weight of any given form to that of the parabolic girder, and the practical weight could thus be calculated by referring to the table.

A diagram was exhibited showing the limiting depths of all parabolic girder-bridges, *i.e.*, the depths at which the weights were infinite ; the curve defining these depths was an ellipse. The same diagram showed the depths which limited economy, *i.e.*, at which the weights were a minimum. Another diagram showed in detail the weights of the principal parts of all parabolic girder-bridges, the depths of which were most economical.

In the summary the author referred to the incompleteness of the investigations contained in the communication, and expressed his belief that a great deal more might be done in the same direction ; but he thought he had succeeded in showing that the construction of a formula generally applicable to the girder-bridges was not an impossibilty, and that even in its present form it would be of practical use for estimating the weights of large bridges. The mathematical part required to determine the theoretical weights of flanges, web, and wind-bracing, was contained in an appendix.

CHIPS.

With reference to the Royal Academy design for a college, which we published last week, we find that it was not "reckoned second" in the competition, as we were informed. There is no second or third place or prize awarded in the Travelling Studentship competition.

The parish-church of Northaw, near Barnet, was destroyed by fire on Sunday, consequent on the over-heating of the warming apparatus. The church was a Perpendicular structure, and was restored a few years since at a cost of £3,000, and a new organ was erected only three months ago.

Memorial-stones of a new Baptist chapel, in course of erection in Marsh-street, Ashford, East Kent, were laid on Wednesday week. Mr. W. R. King is the architect, and the cost will be about £2,000.

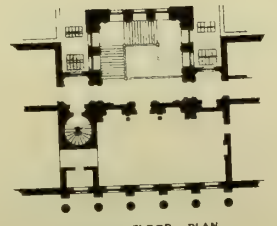
The fine old parish-church of North Curry, near Taunton, is now in the hands of the builder, and a thorough restoration is intended. The rich and massive octagonal towers are crumbling away to such an extent that scarcely a perfect stone or a portion of its details can be seen. The nave and aisle walls are bulged and overhanging to a dangerous extent. The architect is Mr. John O. Scott, son and successor to the late Sir Gilbert Scott, and the clerk of works is Mr. Hannaford.

LIBRARY

CLASCOW MUNICIPAL BUILDINGS

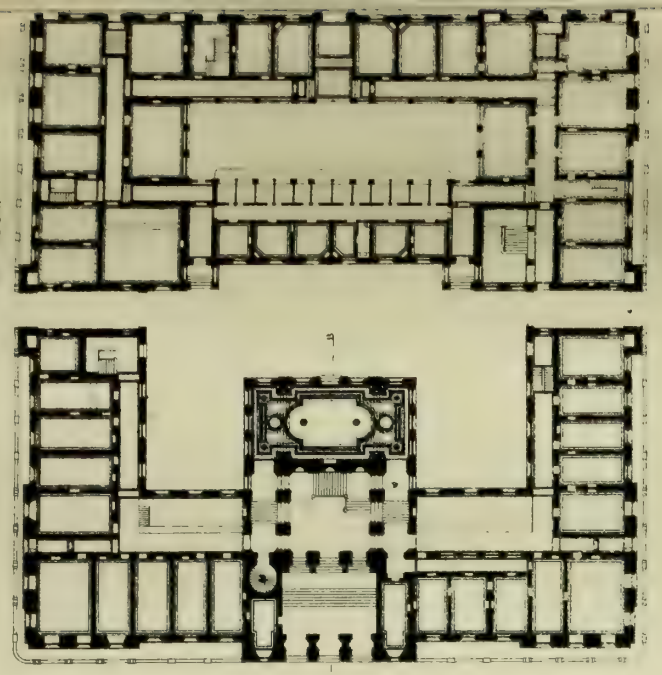
SECOND PREMIATED DESIGN

MESSRS COE & ROBINSON ARCHITECTS



SECOND FLOOR PLAN

SHOWING IMPROVED METHOD OF LIGHTING GRAND STAIRCASE.



GROUND PLAN

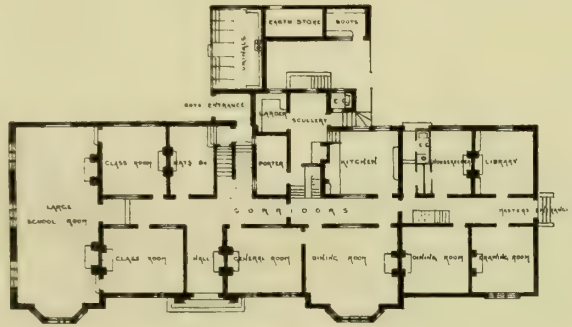
ELEVATION WEST SIDE OF COURT

FIRST FLOOR PLAN

Photo Lithographed & Printed by James Akerman, 6, Queen Square W C

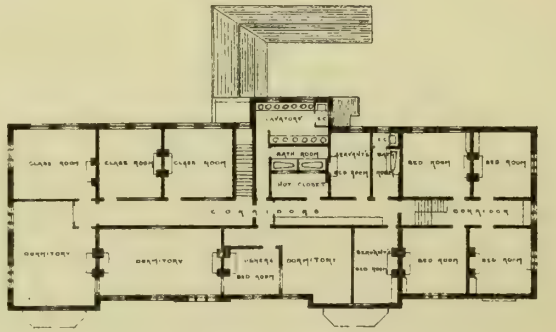
GRAMMAR SCHOOLS HAMPTON

Marshall & Mortimer, Architects, 5 Great Queen Street S.W.



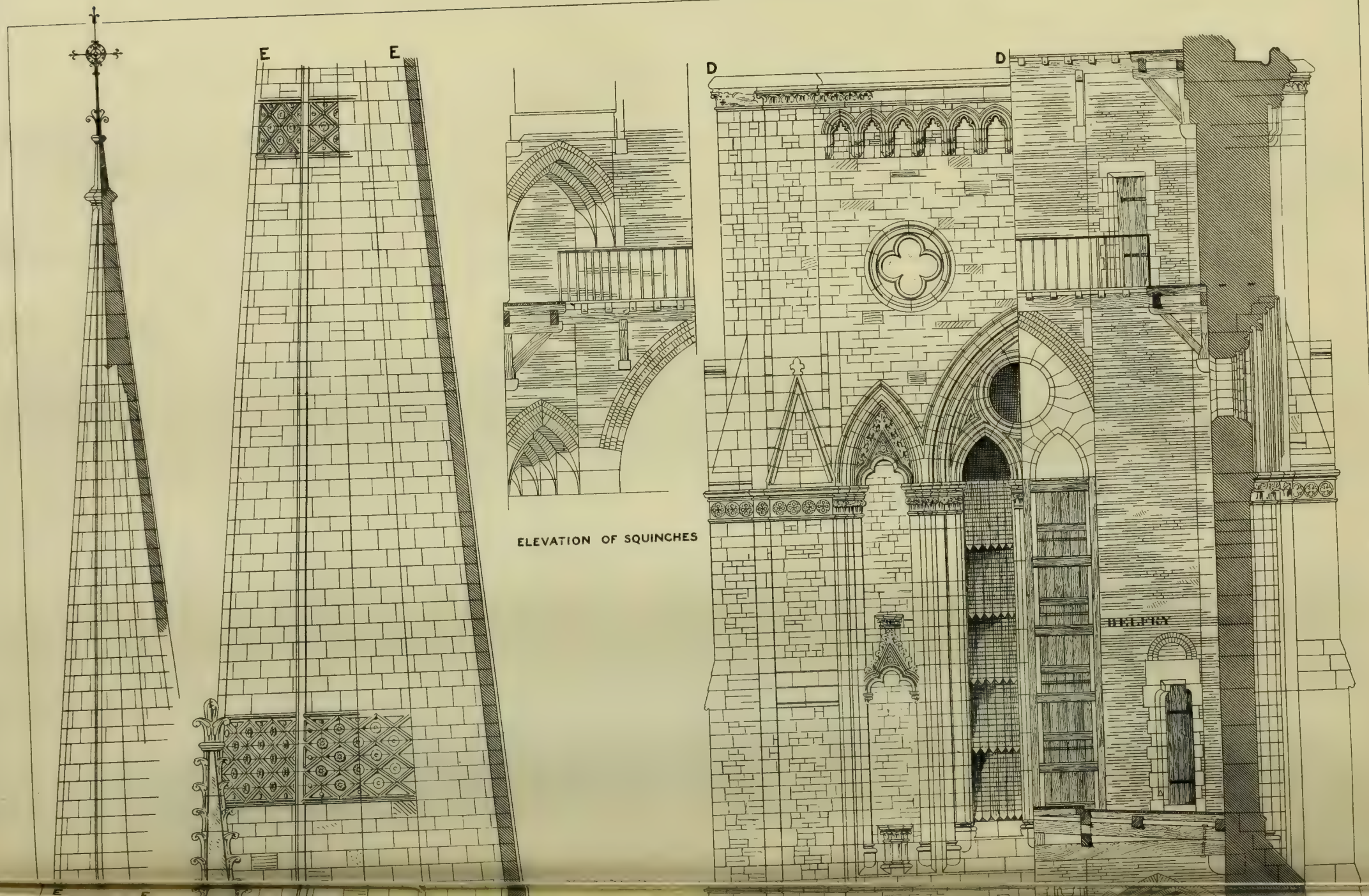
— GROUND FLOOR —

— Scale of Feet —

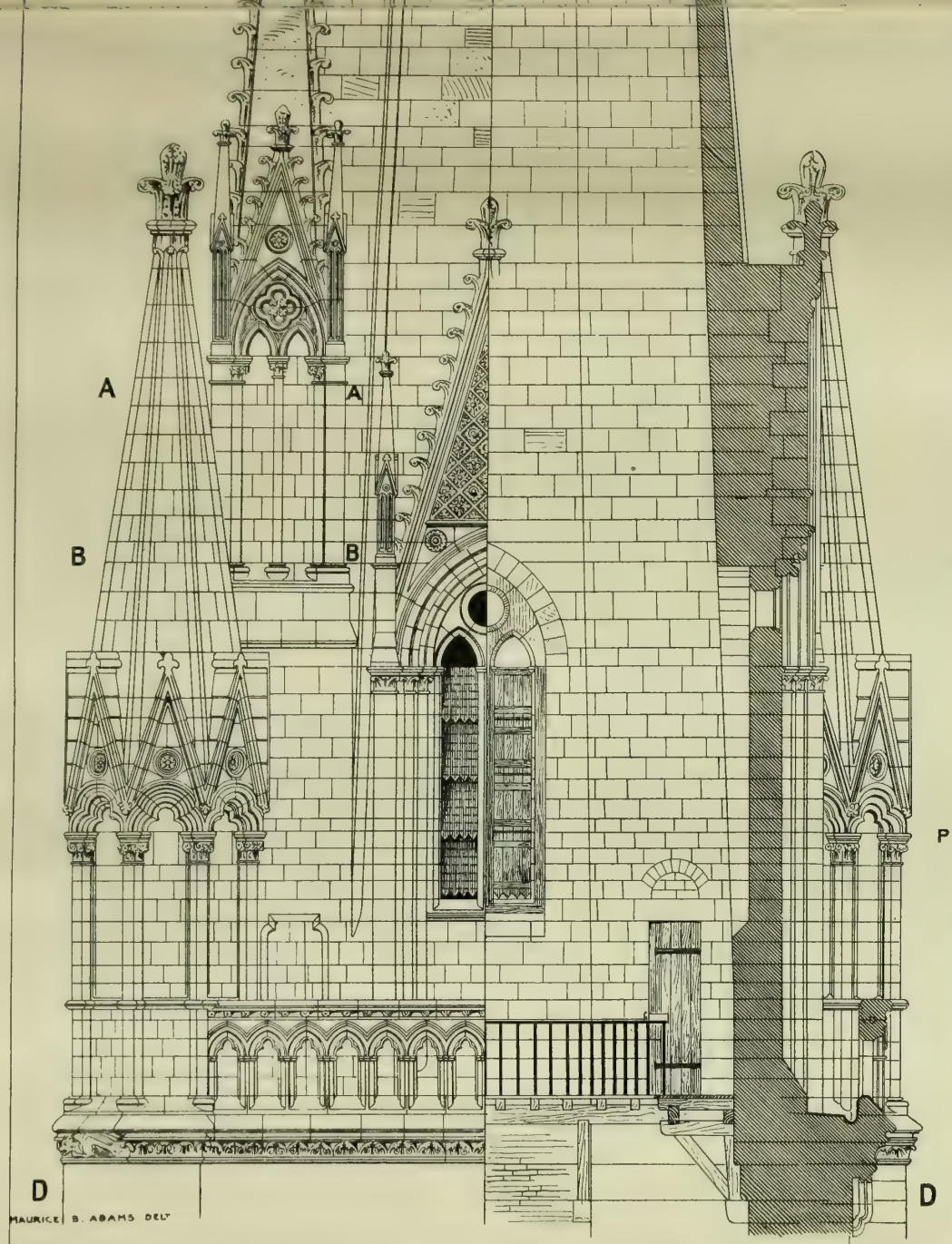


— FIRST FLOOR —

Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

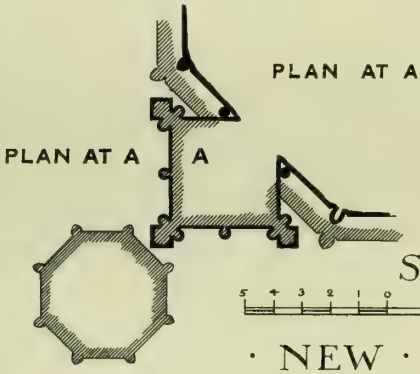


ELEVATION OF SQUINCHES

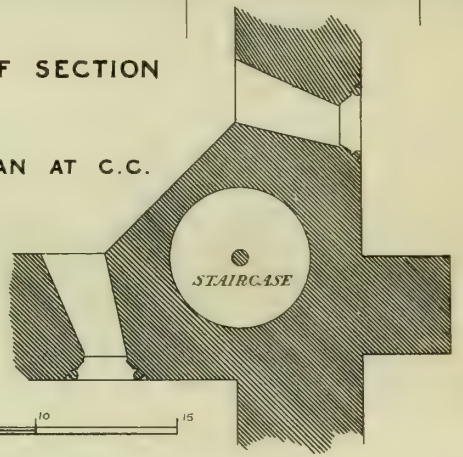


HALF ELEVATION

HALF SECTION



PLAN AT C.C.



Scale of FEET

5 4 3 2 1 0 5 10 15

· NEW · CHURCH · OF ·

· SAINT·MARY·ABBOTTS ·

KENSINGTON

DETAILS · OF · TOWER · AND · SPIRE

SIR GEORGE GILBERT SCOTT R.A.
ARCHITECT

Photo-Lithographed & Printed by James Akerman, 6, Queen Square W.C.

Photo-Lithographed & Printed by James Akerman 6 Queen Square W.C.

DESIGN FOR A CONCRETE HOUSE FOR MR LASCELLES.

DESIGNED BY ERNEST NEWTON, ARCHITECT.

TRURO, AND ITS CATHEDRAL.

THE old parish-church of St. Mary is now almost entirely removed, and the general works are being pushed on by Mr. James Bubb, Mr. Pearson's clerk of works, as fast as frost and snow will allow some 40 or 50 men to proceed. The stained-glass windows that were in its south aisle have been carefully removed for future use, and all the monuments have been cared for in like manner. When the old roofs were taken off, the timbers were found to be so rotten that the wonder is they have stood so long. The south arcade had its stones so firmly cemented together, that to remove them piecemeal was a work of the greatest difficulty. They will all be re-incorporated into the new cathedral. The south wall still stands, 9½in. out of the perpendicular, and propped by stays. It will be pushed back bodily to its original upright position by "jacks," and then will form the south wall of the choir of the new edifice. The foundations for the choir itself are nearly all laid, and a large quantity of earth has been removed preparatory to forming the crypt.

Such of the granite of the old tower that was sound and good, has been reworked for the courses under the plinth and for those between the base-moulds of the crypt. Some of these latter are in the old material also.

A note or two upon the old church just sacrificed for the new cathedral's sake, may at this particular period be interesting, and serve as some record of the past, useful for reference in years to come. St. Mary's Church was, in the main, of Perpendicular type, and it seems quite a matter of conjecture what earlier buildings preceded it. The various dates at which any mention occurs of these are few and far between.

In September, 1259, Bishop Bronescombe, of Exeter—he ruled the See from 1257 till 1280—visited Truro, and dedicated the church of Kenwyn—the day following that of St. Mary's, Truro, and the day after, the church of the already established Dominican Friars. On November 6th, 1328, Bishop Grandison dedicated a high altar at Truro, and in 1421 Bishop Lacy licensed the chapel of St. George, in the parish of St. Mary—which does not imply, of course, that it was a separate church—and the jambs of a window in one of the aisles seem to indicate that formerly this chapel was attached to St. Mary's.

Writing during the reign of Henry VIII., Leland, in his "Itinerary," makes reference to "one paroche Church in Truru;" and another writer (Hals) says that some of the old glass in the north aisle bore the arms of John, Earl of Cornwall, who succeeded to the Crown in 1199. In Kenwyn-street, close by, a Dominican Priory was founded in 1250. There are records that William of Worcester visited it in 1478, and the building was standing until the middle of the last century. Besides the friary just alluded to, there was also, at Truro, a convent of Poor Clares, who, by the bye, had the repute for being very wealthy.

All that has been found that in any way throws light upon an earlier church, has been religiously preserved by the painstaking clerk of works, Mr. James Bubb, and so carefully has all being carried out under that gentleman's direction, that not so much as a single accident has occurred to life or limb during the progress of the works.

Amongst the brasses there is one to Cuthbert Sydenham, Mayor of Truro, in 1627. He died in 1630, and the memorial appears to be a *second-hand* one, for underneath Sydenham's brass, and on the same stone, was found an older one! Some interesting brasses were also found on a buried slab in the chancel-floor. As regards the windows in the north aisle, it is a curious fact proof exists of their having been originally built of an oolite—the original sills and some pieces of jamb left intact in situ proving this, and that the granite used afterwards was merely a restoration, and not the first work. Some 14th-century tracery and jambs were found, worked out of Elvan stone—the banker-marks of the masons are very distinct upon these stones. Many glazed and unglazed tiles were found buried in the chancel, together with a Spanish embossed tile of beautiful workmanship. Several old window-jambs found built in the north wall were, no doubt, those of the 14th-century window, which had been replaced by Perpendicular ones. These fragments were worked in Polyphant or Carclew stone—more probably the latter. Some sandstone remains are largely impregnated with iron, and show strong signs of oxidisation. Mr. Bubb also found, scattered under the floors, several pieces of a granite font, hexagonal in plan, and of Early English character. A piscina built in the north wall, two pieces of a stone newel pertaining to a turret staircase leading to the rood-loft, and other such suggestive items have been found and preserved. Of old woodwork a moulded oak curb—of 15th-century work—some elaborately carved wall-plates and purlins of the same date, and a piece of oak with the date of 1693 thereon are amongst the finds. The present (or rather just defunct) church was built "at the proper cost and charge of the inhabitants, and other pious benefactors," in the early part of the 16th century. There still exists an interesting deed, dated 1504, wherein Sir John Arundel grants permission to the inhabitants of Truro to quarry stone in his manor of Truro Vean, for the building "of the churche, and of a newe towre in the pyshe of owre Ladye of Truro." Amongst the remains of ancient stained-glass in the windows of the south aisle, were to be traced the arms of the Tregians, Trenoweths, Arundells, Carmmenows, Edgecombes, and other of the original benefactors; but this glass was mostly swept away during the middle of last century. On one window, however, what is supposed to be the artist's name is yet preserved, it reads:—"Willmo. 1518." It was at the time that so much of the old glass went (1747), that the "restoration" of the building took place, and then the fine old waggon-headed oak roof was covered by the plaster Classic ceiling, that did duty until the present overthrow. The new spire and tower were built about the same time, and a record in the Churchwardens' book may be read under date of August 9, 1769, notifying that they "gave the men when they finished the steeple, 2s. 6d." The pulpit, which is an inlaid oak one of bulb-like shape, was made by one Bone, of Truro, who was father of the celebrated Royal Academician and enamel painter of that name. The corporation seats of carven oak were made in 1750; so was the organ built by Byfield, and intended originally for the Chapel Royal, but, not being utilised there, a native of Truro, named Lemon, bought it, and presented it to his parish-church. The altar table is of oak, and has around it a brass, on which is inscribed a text (John vi. 54). It was presented by the Rev. G. Phippen, who was vicar from 1625 to 1647. HARRY HEMS.

ROMAN REMAINS, LEADENHALL MARKET.

AN important archæological discovery has been made on the site of the new Leadenhall Market, the excavations for the building of which have been going on for some time, and have brought to light a number of old Roman and mediæval walls of various lengths and thicknesses. We are not yet in a position to give our archæological readers any definite information at present about the construction or original purpose of the structures unearthed; but we may say Mr. Miller, the clerk of works to the market, is engaged in plotting to scale the plan of the foundations; and when this has been done we hope to be able to lay before our readers more details. The plan, drawn from accurate data, reveals two separate walls of some thickness, with others at right angles, and their relative positions and levels lead to the conclusion that the old Roman foundations had been built upon at different periods. The thickest wall discovered is 9ft., though the excavations now proceeding are clearing another important wall. Some of our rather wise contemporaries have already hazarded a conjecture that the massive Roman foundation discovered is that "of a semi-circular apse extending to the unusual width of 33ft." The fact is that nothing of the sort has been absolutely proved, though it may have been imagined by some over-enthusiastic antiquaries who have visited the site. The curved wall which has given rise to this notion does not form more than half an apse (if it can be called one) but is cut by a wall in the centre. The curve has been found by careful investigation, made by the clerk of works, to be semi-elliptical, as it is struck from two centres, the radii being 19ft. 8in. for the large arc and 13ft. 4in. for the smaller. The foundation, or lower part of wall, exposed is 6ft. 8in. thick, above which was a fragment of the real wall 3ft. 11in., which lump of masonry showed a coating of 2½in. of plaster in three coats on the inside. There may be some reason for believing this curved wall formed the apse of some Roman building—perhaps a basilica, but till further discoveries have been made it will be futile to express an opinion. Several fragments of the upper portions of the walls have been found and carefully drawn to scale by the clerk of works, and these in some places measure 8 to 10ft. in height. They are particularly interesting, and show in all cases a Kentish rubble foundation of some height, after which are four courses of thick Roman tile; rubble again, of larger stones, and another layer of tiles, the red tiles forming an occasional bonding to the wall. Not the least important "finds" are rude stone arches formed of thin voussoirs of stones, very irregularly constructed. It has been thought by one antiquary these are Saxon.

THE NEW PARLIAMENT HOUSES FOR CAPE COLONY.

AFTER a competition, about ten years ago, which proved abortive, the Cape Town Government have prepared the contract-plans for their new Parliament House, and the tenders for the erection of the superstructure, furnished, we believe, by English and colonial builders, will be delivered on the 28th of the present month. Mr. Whichcord, P.R.I.B.A., was appointed consulting architect to the Government, and, we understand, has reported upon the general scheme, and has suggested many improvements, both in design and detail; but whether these will be made appears doubtful. The design is Classic, of a rather ordinary type, and with many commonplace features. The plan is an oblong parallelogram, the main façades being 264ft. long, and the return fronts 140ft. The centres of these façades are adorned by porticoes of the Corinthian order, the columns being in pairs, while the angles are emphasised by pavilions of slight projection and with domical roofs. It is intended to build these fronts with red brick, with the porticoes and architectural features and dressings of Portland cement, the materials for which are intended to be supplied from this country. We are sorry the Cape Government, with granite quarries at their service, have decided to adopt materials for their Parliament Houses which have been in this country only used of late years in inferior classes of building, and we hope that at least the columns of the main porticoes will be executed in the natural granite of the locality, a material which has been adopted for the substructure of the proposed building. The granite used for the latter is from the Paare quarries, about forty miles from Cape Town.

The general drawings have been prepared under the superintendence of Mr. J. Fforde, the chief inspector of the department in Cape Town, and the work is to be completed in March of 1883. The plan has been arranged to meet the requirements of the Government. Entering by the portico facing Grave-street, there is a hall and large central vestibule, extending through from one front to the other, and forming the central feature of the plan on its short axis. On each side of the hall, and opening directly from it, are the two chambers, the House of Assembly being on the left and the Council Chamber on the right. These are lighted mainly from the front by a series of pedimented windows, the sashes of which will be opened and regulated by a mechanical appliance beneath the windows. Each chamber is about 67ft. by 36ft. The Assembly chamber has its division lobbies. Corresponding to entrance-hall on the avenue front is a general library. The other frontages are taken up by retiring and waiting-rooms, record-offices, &c. On the first floor are the committee, waiting, and reporters' rooms, and the basement is devoted to record-rooms, &c. Two open areas, one on each side of the central vestibule, give light to the corridors and inner rooms. The central vestibule is a spacious apartment, surrounded by coupled columns and having a gallery, and with the legislative chambers is the main feature of the interior. The Grave-street façade will be of one story, the larger windows of the Assembly and Council chambers occupying the entire wings on each side of the portico; it rests on a granite basement; the avenue façade is of two stories above the basement, the centre portion under portico being of three stories. It is adorned by pilasters of one order. The fall of

the ground being considerable, the granite substructure is brought into view in some of the elevations, and will form a conspicuous element in the design. The present site is on rock, a previous one having been abandoned. We may add that teak is specified for all the sashes and frames, lintels, &c. The approximate cost will be about £120,000.

THE PROPOSED MUNICIPAL BUILDINGS AT GLASGOW.

THE Town Council of Glasgow held a special meeting on Tuesday last (22nd inst.), and resumed consideration of the scheme for the proposed new municipal buildings. The subject came before the Council in the form of a recommendation adopted in committee by a majority, to the effect that the city architect, Mr. John Carrick, should be instructed to re-adjust his sketch-plans so as to show accommodation in excess of that formerly contemplated; this extended accommodation to include an official residence for the Lord Provost, an art gallery, a public library, and apartments for the sanitary department. The Lord Provost moved the adoption of the committee's recommendation, raising the alternative question whether the restricted area of building-ground to which the recent competition was restricted should be adhered to, or whether the Council should exercise the compulsory powers it possesses under Act of Parliament, by acquiring additional ground to the east, and so securing a site large enough to carry a suite of public buildings worthy of the city, and providing, in a comprehensive way, for all local requirements. These broad issues were more or less clearly recognised by the Town Council, and the discussion ran more or less relevantly upon these lines. It was not a discussion involving architectural questions; what description of buildings should occupy the site was never alluded to. It had reference entirely to the extent of ground which should be set apart for municipal buildings, and the mind of magistrates and common councilmen was chiefly exercised in regard to the greater amount of "siller" involved in the larger scheme. The Lord Provost, in supporting his motion, admitted of course that extra expenditure was involved in the purposed amended scheme; but he contended that in any case this increased cost must be met one way or another, and he referred to a proposal to expend £27,000 in improving the present corporation galleries, which were admittedly unsuitable for their present purposes as an art gallery, as showing that if the recommendation of the committee were not carried out the money would be less judiciously expended elsewhere. Mr. Walls moved as an amendment that the recommendation of the committee be not agreed to. The discussion, as we have said, proceeded altogether on the question of cost, and need not be further indicated in these columns. The only argument of the economists was that money should not be spent if it could be retained in the pocket of the corporation; but the fact was overlooked, that by following this policy in the past something like £100,000 has been added to the expenditure which, in any case, the city must now face. After the discussion continued for three hours, the Council adjourned till Thursday (yesterday) without coming to any decision.

The town council met again on Thursday, and resumed consideration of the question of the New Municipal Buildings Scheme. The discussion lasted upwards of four hours. In course of the debate, Mr. Jamieson submitted the following motion:—That the Council disapprove of the motion contained in the minute of 25th February; resolve that the limit of the buildings to be erected under the Municipal Buildings Act of 1878 be limited to the area already purchased; and that it be submitted to the Committee to consider the purposes referred to in the Act for which accommodation be provided, and to instruct Mr. Carrick to prepare a block plan to indicate how that accommodation may be provided, leaving freedom to competing architects to arrange how that accommodation may be best obtained; and that the competition for the new designs be an open one, and that the cost should be increased to about £250,000.

Mr. Jackson moved to the effect that a remit be made to the committee to get prepared by the city architect, in addition to the plans upon which the recent competition was based, an alternative sketch plan, treating as the proposed building area, the block to the west of John-street, the solum of John-street, and the area east of John-street represented by the required frontage of that street; said sketch plan to show how the amount of building accommodation necessary for municipal purposes may alone be proceeded with at once, but in harmony with the building plan, capable of extension if required within the area thus described, and all in accordance with the Municipal Buildings Act of 1878, and to report. The Lord Provost withdrew the motion he proposed at the last meeting in favour of Mr. Jackson's amendment, and on a division between the amendments of Mr. Jackson and Mr. Jamieson, the latter was carried by 28 to 17 votes. Mr. Wall's amendment was thereupon withdrawn, and that submitted by Mr. Jamieson became the judgment of the Council.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

ANDOVER ARCHÆOLOGICAL SOCIETY.—At a meeting of this Society, held at the Town-hall, Andover, on the 19th, a paper was read by Mr. Drinkwater Butt on "Mediæval Architecture," and was followed by a discussion in which the Rev. C. Collier, the Rev. H. C. M. Barton, and other gentlemen took part. The paper was profusely illustrated with drawings by the author.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The sixth meeting of the session was held last Wednesday week, Mr. Thos. Morgan, F.S.A., in the chair. Mr. Worthington Smith exhibited a pre-historic quern from Thetford, and two large flint implements from the gravel drift of the cemetery, Southampton. Mr. Allen drew attention in reference to the recent congress, to the view of Stonehenge, in 1588, in the "Particular Description of England," by Wm. Smith, Rouge Dragon. This somewhat fanciful sketch shows several of the top stones as being then in position. Mr. Saunders described a specimen of the Dutch "Thunder Glasses," which are but seldom seen in England. The emission of water from a central spout gives notice of atmospheric change. Mr. Loftus Brock, F.S.A., described the progress of the discoveries at Leadenhall Market. Large masses of Roman walls continue to be exhumed, and these prove to be the foundations of a building of large size, probably of basilica form, which appears to have had an eastern apse, with two transept-like chambers to the south, with other buildings to the west. Traces of four distinct burnings have been found. The first paper was by Mr. Francis Brent, a description of an interment found at Castle-street, Plymouth, and which proves to be of Romano-British date. A large urn was found covered with slabs of stone set sloping over it. The discovery was made in the heart of the present town, in preparing for an iron column of a warehouse. The second paper was by Mr. Chas. Watkins, who described in detail the portion of the old City rampart of London, recently discovered at Houndsditch, and removed. About 70ft. of the wall were cut through, and the lecturer minutely described the construction. The wall was one of Kentish rag-stone, bonded together with the usual bright red tiles, and having a chamfered plinth on the outer side. A discussion ensued, and the fragments of mortar and brick examined. The work was pronounced to be of Roman date, and it corresponds very closely to the portions of the well recently found in the Tower and in America-square. The paper was illustrated by a large series of drawings. The third paper was by Mr. J. Romilly Allen, F.S.A. (Scotland), and was on Pre-historic Structures at Tealing, Forfarshire. There is a perfect underground house, and many stones with cup and ring markings.

COMPETITIONS.

SELBY SCHOOLS, &c.—The designs placed first in this competition are by Messrs. Wm. Waddington and Son, of Manchester and Burnley—motto, "Experientia"; the second and third premiums being awarded to Mr. C. O. Ellison, of Liverpool—motto, "Liverpool," and Mr. E. Birchall, of Leeds—motto, "Raikes," respectively. The scheme includes the erection of new Wesleyan schools and remodelling the present chapel, the proposed outlay being about £4,000. The works will be proceeded with forthwith.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

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PRO BONO PUBLICO. (Your letter, though sent to us, is addressed to a contemporary. Our inference is that it has been sent to more than one of the professional journals, and it would, therefore, be wasting our space to insert it.)—N. E. R. (Returned; the clerk of the works was, we imagine, employed by the architect?)

Correspondence.

JERRY BUILDING.

To the Editor of the BUILDING NEWS.

SIR,—A very great deal of nonsense appears in the various professional journals from time to time, your own included, in the shape of correspondence, on the evils of bad or "jerry" building. Somebody buys a house for, say, £400, and thinks he has been keen over his bargain, and possibly boasts that he has got it "cheap," until he has lived in it for a few months, and finds that what in his ignorance he took for broadcloth is only "shoddy," and the poor jerry builder too often gets blamed for what is the parsimony of the house-buying portion of the public.

To illustrate my meaning, I will suppose a case in which a builder erects two houses adjoining, practically the same in plan and elevation, and also in finish, so far as moulding, cornices, painting, &c., is concerned.

In what I will call No. 1 he uses every precaution to secure a substantial, sanitary house. The whole area, if at all damp or of made ground, he covers with a bed of cement concrete, and builds his wall up to above the ground-line in cement, on which he places a good vitrified damp-course, by Taylor or some other good maker, on a layer of asphalte, using it also on all sleeper and dwarf walls, for floors and steps. He buys nothing but well-burnt and good-shaped bricks, and is careful to get a sharp fresh-water or pit-sand, free as possible from loam, and builds fire clay linings into all flues. He also uses for joists to first floor, 11in. by 3in.,

and 11in. by 4in., sound redwood deals, and not less than 9 by 3 after, and all well-stemmed, covering them with 1¼ grooved and tongued flooring-boards in narrow widths, and uses equally durable timber in his roofs and his partitions, properly trussing and bolting them; he also uses for his gutters, aprons, and flashings, 7lb., 6lb., and 5lb. lead, and secures his slates with 7lb. copper nails, and laid to a 3in. lap. In plastering he uses lath, and half and double lath, and plenty of hair, and sees that all walls and partitions are plastered to floor-line, at back of skirtings, &c., and fixes grounds for all architraves and skirtings, and has all window-frames properly bedded in. He also lays in sound sanitary pipes for his drains, trapped in a proper manner in the proper place, and for his water service uses the heaviest weight of pipes, and remembers that during the next or other winters severe frost may be experienced, and does a host of other things that would be specified by a competent architect, *for he intends to live in it himself.*

In house No. 2 he commences with the cheapest brick he can buy, half burnt, and wholly bad, using for mortar the surface-soil of the site, road-mud, or other available rubbish, and "runs it up" as quickly as possible; no concrete, no damp-course, flues carelessly pargetted with the same mortar, and often not at all; for joists using 7in. by 2½in. battens, and less for the smaller rooms, with ⅞in. flooring, and with roofs and partitions to match. Gutters and flashings of No. 10 zinc, slating with 1½ lap, and iron or zinc nails, water-pipes the lightest he can get, and his waste and overflow pipes carried into w.c. trap or soil-pipe for economy. In the matter of drainage he lays a lot of pipes in a trench, and lets them take their chance, and does a hundred other "scamping tricks" that the district surveyor does not, and, in fact, is utterly unable to prevent.

On totalling up the cost he finds that, allowing a fair profit on the transaction, he can offer No. 1 for £1,000; but at the same time he explains to the would-be buyer that he can take for the next house something like £900, and the bargain is struck, and the builder knows that if he builds a half-dozen more in the same style, they would all be off his hands before No. 1, provided he wished to sell it.

As soon as the house begins to go wrong, say, after the first heavy day's rain, or a week of very hot weather, or a few degrees of frost, the purchaser begins to use unparliamentary language about the builder, whereas, for a moderate fee, a respectable surveyor would have pointed out and explained to the would-be purchaser, the respective merits and demerits of the two houses.

Your house-buyer or renter, for that matter, too often wants a larger or grander house than his capital or income will warrant him in bargaining for, and as a matter of choice he takes the showy imitation, in the same way that he buys his paste "diamonds" and zinc "bronzes," and shoddy "sealskins." Judging from my own observation, there are as many "jerry" buyers as "jerry" builders in the world.

If a man wants a good house, let him build one, employing a competent person to superintend it, or employ a respectable builder at a fair price, which may easily be done with the help of one or other of the many building societies in operation, and he will then be doing something to stamp out the offending "Speculator," and the still more objectionable financier behind him, who gets the lion's share of the plunder without the odium attached to the business.—I am, &c.,

S. B. Burton.

Newcastle-on-Tyne.

FROZEN WATER SUPPLY AND KITCHEN BOILER EXPLOSIONS.

Sir,—Mr. Buchan's statement in your last issue, that kitchen boilers are usually supplied from the cold-water cistern, is most astonishing, and must, I think, account for many of the explosions which occur in the North. *To prevent the freezing of boiler-supply a warm circulation must be maintained through all the pipes.*—This can only be properly effected by having a hot-water cistern connected with the boiler by *two pipes* exactly as for hot-water heating apparatus. The cistern must, of course, be high enough to supply warm water where required, and it will form the expansion-box; no other provision for expansion is necessary. The *flow-pipe*, from which all cocks draw off, must go *from the top of the boiler*, and (that there may be no dead branches like the pipe I to the scullery) must travel to all places which are to be supplied with hot water, and, finally, be connected to the bottom of the cistern. The *return-pipe* may travel in any direction back *to the bottom of boiler*. Thus, when there is fire, circulation will be kept up in the whole length of the pipes. All would be warm, and freezing would be out of the question. There is very little, if any, use in Mr. Buchan's hot-water cylinder, M, and the *third* circulating pipe, G, is worse than useless, for it would tend to prevent circulation in the pipes D and F, and thereby promote freezing.

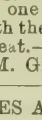
If a cock is kept trickling, to prevent freezing of cold supply, it should be one in connection with cold-water cistern, not with the hot. Waste of hot water must mean loss of heat.—I am, &c.,

J. M. Gething, architect.

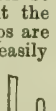
BURSTING OF PIPES AND BOILERS.

Sir,—A very simple and effective plan to prevent the bursting of water-pipes when exposed to severe cold is to form a small air-chamber at or near the part affected. If the pipe runs horizontally, a short branch standing vertically to it thus

will answer well, but if the pipe be vertical it should be formed by either continuing the pipe beyond the draw-off or putting a short branch out at the side, and then turning it up parallel to the pipe thus—



If, however, it be of a hot-water pipe from a hot-caused to dip being turned up; otherwise the bubbles of steam will rise into the chamber, force out the air, condense, and finally fill the chamber with water. With the dip, however, this can scarcely arise. The increase in bulk caused by freezing water is very slight, not exceeding about 12 in 10,000; the chamber, therefore, need not be large. Six inches of pipe of the same size as the main will, in most cases, be ample. Due allowance, however, must be made for the compressing of the air if the head of water be great. A similar contrivance will prevent the rattling often caused in pipes when the taps are quickly shut off. This is generally most easily done by turning up the endof the pipe thus—



for about 6in. I have found this ample to stop all rattling, even with a head of 50ft. of water.

The bursting of boilers is not, however, caused by split pipes, but from the outlet and inlet-pipes being frozen up, and all outlet for the steam being cut off. Safety-valves have, again and again, been recommended. Unfortunately, safety-valves too often get stuck fast when wanted. A cheaper and much more reliable plan is to insert in the boiler a small fusible plug. If the alloy of which the plug be formed be made to melt at a temperature of about 250° Fah., it will be impossible for the steam to be raised beyond 16lb. above atmospheric pressure, or equal to a head of water of about 30ft.—a height much less than the ordinary run of hot-water boilers. If in conjunction with this it be made an invariable rule never to take a draw-off direct from the boiler, but from the circulating-pipes only, it will be impossible to empty boiler save by boiling the water away. This cannot arise unless there be a free vent for the steam, and, consequently, it will be scarcely possible to have a burst boiler from any other cause than by letting water into it when it is either red-hot, or nearly so. In this case, no contrivance will prevent an explosion, and if the cook has not sufficient gumption to prevent such an occurrence, the master or mistress should find it, or blame themselves only if their boilers burst.—I am, &c., T. E. Julian.

"WONDERFUL GRATE."

Sir,—Many of your readers as well as myself would be very much interested in the brief account given of the above last week, and if it does all that its inventor claims it is indeed a "wonderful grate." There are a few points which your readers would doubtless be glad to know—

1. Does the heat from the fire in any way carbonise the coal in the feeder, as, if so, tar would be formed, which would be a great nuisance?

2. If the fire required feeding while burning, would not the removal of air-tight door cause a draught and fill the room with smoke, &c.?

There are several other points which should be considered, such as (1) the facility for sweeping chimney, (2) the lowness of the front hood causing the heat to pass up the chimney.—I am, &c.,

West Bromwich, Feb. 21. J. T. E.

[Several sentences embracing inquiries as to makers' names, prices, &c., have necessarily been struck out. "J. T. E." or any other readers should apply direct to the makers, whose advertisement appears on our front page.—Ed. B.N.]

EXTERNAL SOIL-PIPES.

Sir,—I am afraid that Mr. White's letter on p. 192 has been written too hastily, and before he had time to digest my explanations given at p. 165. I there showed that the sewage-polluted air blown off into the atmosphere from an inside soil-pipe was several times the *quantity* and also worse in *quality* than the sewage air from an outside soil-pipe; consequently, I am correct in asserting that "the inside soil-pipes generate and discharge into the air more bad air than the outside ones."

As the subjects of the highest importance for us all, permit me to call attention to another important point, in this relation, and one which I am not aware has yet been publicly referred to, viz. this: An inside soil-pipe has generally a speedy, constant current of air through it, the effect of which is soon to *dry up* the interior, as the wind dries clothes upon a blowy day. Now, if the water coming down the soil-pipe was pure, this would not matter; but the water is foul and contains large quantities of organic matter, and possibly some particles of particulate contagia. Now, so long as the inside of the soil-pipe is wet, these particles may be held or moored to the side of the pipe; but as the water evaporates, or is carried off by the current of air, then many of these particles may break loose from their moorings and get carried along with the current of air where it goes; and so, if a leak existed in the soil-pipe inside of the house the air from the soil-pipe might soon carry with it thousands of organic particles—some of which may be particulate contagia—into the atmosphere within the house, the results of which may be baneful to the inmates.

The greater heat of the inside soil-pipe is more favourable to fermentation or putrefaction, and to the generation and distribution of foul organic matter and particulate contagia than the greater coolness of the outside one: hence the outside one is the safest.

For Mr. Read, C.E., at p. 192, to speak of the "risk of passing your closet junctions through the outer wall to connect them with the vertical outside soil-pipe" is simply absurd. There is no particular "risk" in the matter, and, if wanted, an outside soil-pipe can quite easily be protected from frost. In the case of chokage in the vertical pipe, these outside side junctions are often of great service.

It is another mistake of Mr. Read to suppose that: the warmth of the house facilitating the action of the ventilating-pipe is a benefit to the inmates. People forget that while fresh air entering one end of a *short* soil-pipe may come out not very impure at the other end, yet the same air, after passing through a *long* soil-pipe, comes out highly impure and dangerous, and especially if the pipe be warm. So that in dull or close weather, when there is no wind to carry off the aërial impurities, to have thousands of inside soil-pipes each discharging some hundreds of feet of bad air into the atmosphere is anything but sensible, and is scarcely creditable to our *science*, and for Mr. Read to advocate such ideas, in combination with making the house drains ventilate the sewers (which idea is not new, as he imagines) is very bad *sanitary* engineering, however "civil" it may be.

This combination of the house-drains with the sewer, which Mr. Reid advocates as a grand new idea of his own, is the plan which was in use at Croydon in 1875, when Dr. Buchanan examined that town, and which plan of "laying on"—as he expresses it—the sewer air to the houses was one cause of the wide and rapid spread of the fever, owing to the fact that the sewer air which flowed along the house drains, carried with it the *germs of the fever*. To prevent this in future Dr. Buchanan recommended that:—

"Thirdly, the direct connection of houses with sewers must, wherever possible, be interrupted; and an efficient system of ventilation be applied to every house-drain." See "Reports of the Medical Officer of the Privy Council and Local Government Board," new series, No. VII., for 1875, published in 1876. I would recommend Mr. Read to peruse this masterly report on Croydon; it may help to prevent him from again recommending plans which have already been weighed in the balance and found wanting. It also shows how much, in such a matter as sewer ventilation, all engineers may learn from an able physician.

The "fundamental error" in the ideas I have condemned is mere writing without due thought, and not having the right knowledge and experience.—I am, &c., W. P. Buchan, S.E.

LYVEDEN NEW BUILDING.

Sir,—In the description of "Lyveden New Building" in your issue of Feb. 4, you request a suggestion as to the explanation of the letters "E. T. N." (or "T. N. E.") in the wreath surrounding one of the emblems. This does not seem difficult of interpretation if we consider it in connection with the adjacent design, round which are the words "Esto Mihi." In this we have the emblems of the sacrifice of the Crucifixion, typical of the redemption and salvation of mankind, with the initials of the words, "Jesus Hominum Salvator" (or the first three letters of the Greek name Ιησους), and the pious builder says, "Esto Mihi"—"May it be so for me."

In the design under discussion, we have the Greek Χρ, the first two letters, and the emblem of the man Christ, who was born into the world to save sinners; and so Sir Thomas Tresham surrounds it with the initials of words declaring such fact to the reader, "Tibi Natum Est"—"He was born for thee."—I am, &c.,

EDWARD B. KNOBEL.

Bocking, Braintree, Feb. 18.

BUILDING STONES.

SIR,—In your issue of the 11th inst., Mr. Chas. Trask makes a slight error in stating that the spire of the church of St. Mary's, Truro, was of granite.

The stone came from St. Stephen's, and is of quite a soft nature.

There are churches in Cornwall I could mention built of granite, which have been standing as much as 800 years, and still show the tool-marks in the stone.

This even would hardly be a criterion of the durability of granite, as there were no proper quarries in those days, and only surface-stone was used for buildings, which is very inferior to the good blue stone out of the quarries nowadays.—Yours, &c., D. H.

SIR,—Without entering into the question of the comparative merits of Doulting and Portland oolites, we shall be obliged by your inserting a word or two in reference to Mr. Trask's remarks in your issue of the 12th inst., concerning the state of the granite used in the old tower of St. Mary Church at Truro.

One hundred years ago granite was not "quarried" at all in Cornwall, but surface-stone was exclusively used for all building purposes. A great deal of this surface rock, or "moor stone," is of very inferior character.

There is also a kind of granite found in the St. Stephen clay district, which is decidedly perishable when used for external work, and cannot be compared with the granite produced from the deep quarry workings, such as those of the Mabe, Constantine, Stithians, and some other districts.

It will be a pity if any inferior material is used in the construction of so fine a work as the new cathedral at Truro is designed to be.—We are, &c.,

JOHN FREEMAN AND SON.

Penryn, Cornwall, February 16, 1881.

TWO CAUTIONS.

SIR,—Architects should be on their guard against the wiles of an impostor who has been practising for some time on the better nature of the architectural profession. After an extended London experience he is now "working" the provinces, and has been heard of at sundry places in the North. He is in appearance tall and straight, and is in habit of using freely the name of Mr. Alfred Waterhouse, R.A. The impostor's name is subject to variation. He ostensibly applies for work, but ends in begging. It would be probably a real charity to hand him over to the police.

Another caution I venture to give at the present time, when architects have so much to do with limited liability enterprises, and that is, to beware of accepting the so-called "fully paid-up shares" in return for their services. Unless specially registered, such payment is not legal, and may, in case of the company "winding up," result in an unpleasant surprise—the being called upon to "pay up" for these same shares. I know those who are in this dilemma at present time. In some cases in which actions have been brought, the judge, I suppose by rule of equity rather than law, has decided in favour of the shareholder; but it does not always happen so, and it may be that the unfortunate man not only loses the original sum, but has to change places, becoming a debtor instead of creditor, and is mulcted a second time—a double loss and costs!—I am, &c., M.

SANITARY SCIENCE IN ITS RELATION TO CIVIL ARCHITECTURE.—WARMING AND VENTILATION.

SIR,—In your issue of last week, containing the adjourned discussion on Mr. E. C. Robins's paper on the above subject, I was particularly struck by the remarks made by Mr. Henry Dawson on the method of ventilating rooms by means of leading cold air in a pipe to within a few feet of the ceiling, in which he says the cause of failure is a down-draught in all instances unless the ceiling be at least 20ft. in height. Now, Sir, I know several cases in which this method is used, both in private houses and offices with the greatest success. In each case the method employed is as follows:—A 6in. metal or other pipe is carried from the floor level to within about 3ft. of the ceiling at the other end of the room over the fireplace, and at the level of the ceiling is placed one of Mr. Boyle's admirable ventilators leading into the smoke-flue. I never at any time heard the slightest complaint of a down-draught. They have been in use during the whole winter, and the ceilings range from 11 to 13ft. in height in both cases.—I am, &c.

VENTILATION.

Intercommunication.

QUESTIONS.

[6405.]—**The Institute Gold Medal.**—Will anyone who really knows say what are the qualifications for the gold medal of the Institute? A well-known architect told me some years since that he thought it would be much fairer and more satisfactory to all concerned if it were shot for annually, like the Queen's Prize, at Wimbledon; and another said to me a few days since he was of opinion that at a recent award it must have been tossed up for! Also, what is the intrinsic value, and is it true that since Mr. Ruskin's refusal it has been a work of difficulty to persuade any one to take it?—MEDDLER.

[6406.]—**Felting a Roof.**—Will any of your readers kindly inform me whether it is necessary to board first when laying felt under a tile or slate roof when the rafters do not exceed a foot apart!—A SUBSCRIBER.

[6407.]—**Cubing a Building.**—Will some one tell me if, when cubing a building to find the cost, the foundations and roof are taken into account? If not, what part of the building?—A SUBSCRIBER.

[6408.]—**Architectural Tour.**—Will any correspondent kindly suggest a book to study with a view to going a measuring and sketching tour in Normandy and Brittany? One which would suggest the best buildings to copy would be of most value to—PEACOCK.

[6409.]—**Milled Lead.**—Lead for a flat is specified 5lb. I find it weighs only 4½lb, varying from 4lb. 7oz. to 4lb. 9oz., the samples being taken from centre of sheets. Is 4½lb. lead manufactured purposely, and shall I be wrong in condemning such lead as does not approximate more closely to 5lb. than the above?—J. T.

[6410.]—**Clerk of Works.**—Will someone inform me if it is the duty of the clerk of works, or of the contractor's clerk, to make out the account of extras at the end of the job?—N. E. R.

[6411.]—**Eaves.**—Having a dispute with a neighbour as to the allowance for an eaves drop, which in reality measures about 6in., yet I claim 9in., can some reader of this journal inform me what projection is the general rule or law, and whether any difference in the use of slates and tiles!—AN OLD SUBSCRIBER.

[6412.]—**Charges for Abandoned Plans.**—An architect is selected in a limited competition by the members of a school-board and becomes appointed architect to the board. Four schools are erected in different parts of the town, two of which passed the Educational Department without any alteration, 9ft. super being allowed for each child; but the plans for the other two schools were not passed by the Educational Department, and their lordships gave orders that 10ft. must be allowed in the mixed school-room and 8ft. in the infants, instead of 9ft, as allowed in the other schools, necessitating a different arrangement in each case. Of course, the plans had to be entirely re-drawn. The buildings have since been erected accordingly, at a cost of £2,300 and £700 respectively. "Constant Reader, R.," would feel obliged if some of your correspondents would say what would be a fair charge to make for the abandoned plans. The usual commission has been paid on the cost of the schools as erected. The estimated cost of the first or abandoned sets of plans was £2,200 and £760.—CONSTANT READER, R.

[6413.]—**Green Slates.**—What are the best green slates to use, to work in courses with Bangor 24 × 12 or 20 × 10, reliable as to colour and wear?—BUILDER.

REPLIES.

[6370.]—**Chambers' Proportions.**—These proportions are often used, but some architects prefer to take the particular examples of the orders they adopt and carry them out in important Classical buildings. Examples, for instance, of the Roman Ionic will be found to differ in the proportions of the parts. If we take the Corinthian, the usual height is not exactly determinable on account of the ruined state of the best temples, but the height usually given is from 2½ to 3 diameters. These differences being very common, it is sufficient for the architect to take the proportions laid down by Chambers, though Vitruvius, Scamozzi, Palladio, and Vignola are generally followed as being older authorities.—G. H. G.

[6395.]—**Oak Paling.**—Use Stockholm tar, which contains creosote, and has strong preservative qualities, while, being transparent, it shows the grain of wood.—G. H. G.

[6396.]—**Bell Turret.**—For a turret of the description you furnish, the corner standards may be at their smallest section, 5in.; but it is impossible to give a satisfactory answer without seeing the elevation of the turret and the mode of construction intended, especially the bracing or filling in between standards. G. H. G.

[6397.]—**Area Walls.**—The boundary walls are not necessarily the area walls. If the tenant has to keep the former in repair under the lease, I do not consider that he is called upon to repair the area walls, if by these are meant walls round the house, serving as retaining walls, and within the boundaries. As the landlord has to keep main walls and timbers in repair, it seems to me that he is certainly liable for damage by frost to the area walls, which belong more properly so the house. The question is whether by the term "boundary walls" the area walls are included. I should say not.—G. H. G.

[6397.]—**Area Walls.**—The retaining walls can hardly be boundary walls, so that the repair should be executed by the landlord.—H. L.

[6399.]—**Filtration.**—Parry's "Water: its Composition and Collection," contains information of a general kind, and Capt. Galton's manual on "Sanitary Construction" may be consulted, but there is no authoritative treatise on the special subject that I am aware of.—G. H. G.

[6401.]—**Modulus of Rupture.**—I cannot find the article in Rankine, but believe the formula is to enable the modulus of rupture to be found by experiment. To calculate the strength of the beam it should be borne in mind that the top and bottom halves of it act in opposition, with an average stress of half the greatest stress, *i.e.*, half the modulus of rupture, which stress is concentrated at points ⅔ of the distance from the neutral axis to the top and bottom edges of the beam respectively. We have thus $f = \left(\frac{l \cdot w}{4 \cdot h} \div a\right) \times 2$, where f = modulus of rupture, l = length in inches, w = breaking weight in lbs., h = two-thirds of the depth for reason above, a = area of top or bottom half of beam. The $\frac{l \cdot w}{4\,h}$ is the ordinary formula for beams with load in centre, and is multiplied by 2 on account of the average stress being half the greatest. The formula stands thus:— $\left(\frac{12 \times w}{4 \times \frac{2}{3}} \div \frac{1}{2}\right) \times 2 = 18\,w$.—E. WEBSTER.

[6401.]—**Modulus of Rupture.**—Let A B be a beam of uniform rectangular section, of length x, breadth b, and depth d, loaded at centre with the weight W, then we must have external bending = internal, that is, $\frac{W}{2} \cdot \frac{x}{2} = \frac{f}{y} \mathrm{I}$. Let $y = \frac{x}{2} = \frac{f}{\frac{x}{2}} \frac{1}{12} b x^3 = \frac{f}{6} b x^2$. Now let x = 1ft., $8 = 1''$, $d = 1''$, then $\frac{W\,12}{4} = \frac{f}{6}$ or $f = 18$ W. Thus, if W be made just sufficient to break the beam, we know f, which is called the "modulus of rupture."—H. S, Belfast.

[6402.]—**Quantity of Stone in Spire.**—"Novice" is right. The quantity for each stone should be the smallest rectangular block out of which it can be cut, great care being taken that the quoin stones are carefully measured.—H. L.

[6402.]—**Quantity of Stone in Spire.**—In taking the cube contents of spire the stones ought to be measured to the extreme dimensions as they come from the saw of the banker, as, of course, the waste in working it must be allowed.—G. H. G.

[6403.]—**Builder's Accounts.**—I prefer subtracting the smaller from the larger items of the same description in the abstract, and carry the difference to the bill of extras In the case mentioned 20 yards is the amount to be billed out.—G. H. G.

[6403.]—**Builder's Accounts.**—If the extras and omissions are composed of exactly similar items the nett results can be shown; but as, in most cases, only two or three items could be so adjusted, it is usual to bill the extras and omissions in full, making a summary at the end.—H L

[6404.]—**Sanitary Engineering.**—A weight falls 16·1ft. in one second, 64·4 in two, &c., that is, $16{\cdot}1 \times t^2$, where t = time in seconds. The time required for passing over the horizontal space of 1ft. at the velocity of 1·6.t. per second is $\frac{1}{1{\cdot}6}$ seconds, and the vertical space fallen in that time is $16{\cdot}1 \times \left(\frac{1}{1{\cdot}6}\right)^2 = \frac{16{\cdot}1}{2\,56} = 6{\cdot}29$ feet. The other formulæ in like manner.—E. WEBSTER.

[6404.]—**Sanitary Engineering.**—The "drop" in the invert necessary to allow a liquid at certain velocities to overleap, so to speak, a given opening, is determined by the resultant of two forces, the momentum of the water in sewer, and the force of gravity. The problem is discussed in works on hydro-dynamics.—G. H. G.

PARLIAMENTARY NOTES.

OPENING MUSEUMS ON SUNDAYS.—In the House of Lords on Tuesday, Lord Dunraven moved a resolution in favour of opening the Museums and other national institutions on Sundays Lord Shaftesbury moved as an amendment that such institutions should be opened on week-day evenings up to ten o'clock. The Duke of Somerset supported the resolution, but would exclude the Museum library from its operation. The Archbishop of Canterbury pointed to the fact that the experiment had failed at Maidstone after being tried for three years. He believed that the sense of the country was against the proposal. Lord Rosebery argued that the change proposed might do good, and could not possibly do harm. Lord Cairns reminded their lordships that the House of Commons, which had to provide the means, had repeatedly rejected this suggestion by large majorities. Lord Granville contended that the experiment had succeeded wherever it had been tried, and that the violent opposition which the motion formerly encountered had utterly disappeared where such institutions were now open on Sundays. After a few remarks from the Duke of Argyll against, and by Lord Thurlow in favour of, the motion, the House divided, and having by 41 to 34 rejected the motion, subsequently agreed to the amendment.

ORDNANCE SURVEY.—Mr. Pugh asked the First Commissioner of Works in the House of Commons on Tuesday, what steps had been taken since last session to accelerate the completion of the Ordnance Survey. Mr. Shaw-Lefevre said: In consequence of the promise given last session, every endeavour has been made to accelerate the survey. A supplementary estimate for £5,000 was voted at the end of last session. I shall ask shortly for another supplementary estimate for the current year of £3,000, and for next year the vote asked for will be £40,000 in excess of last year. This will enable a very considerable acceleration of the survey, as

much as will be possible within the time, and with some further increase in subsequent years the survey may be completed by the year 1890.

LIGHTING THE NATIONAL GALLERY.—In reply to Mr. D. Grant on Wednesday, Mr. Shaw lefevre said that the first Commissioner of Works could not order the lighting of the National Art Gallery, so that it might remain open on weekdays until ten o'clock, without the concurrence of the trustees, and it was quite impossible for him to do so against their opinion. They objected to gas as dangerous to the national collection, and he did not think that there was at present sufficient experience to decide upon the suitability of the electric light.

LEGAL INTELLIGENCE.

CASE UNDER METROPOLITAN BUILDING ACT.—"SHOP FRONTS" (Section 26, Rules 2, 3, and 5.)—Mr. Bedford, the builder of an extensive block of buildings, attended before Mr. Paget on the 11th inst., at the Hammersmith Police-court, in answer to a summons taken out by Mr. T. E. Knightley, district surveyor for Hammersmith, to show cause why he should not separate eight shop-fronts, facias, and cornices, with fireproof pilasters and trusses, and limit projection of shop-fronts to 5in. from external walls. Mr. Knightley conducted his own case. Mr. J. Haines, solicitor, appeared for defendant. Mr. Knightley stated that as at present constructed, the pilasters between shops were of wood, and that the facias and cornices (also of wood), were continuous from one end of the buildings to the other, calling his assistant to prove this, and also that the shop-fronts projected considerably more than is permitted by the Act. Mr. Haynes called witnesses, one of whom admitted that the pilasters had been as described, but that an alteration had been commenced; whereupon the magistrate allowed Mr. Knightley his costs for the day, adjourning the summons for the requirements of the act to be carried out; after which, the parties met on the works, and defendant undertook to make application to the Metropolitan Board of Works for "special sanction."

LIABILITY OF VENDOR OR PURCHASER IN CASE OF FIRE.—"RAYNER V. PRESTON."—In this appeal to the Supreme Court on Monday, from a decision of the Master of the Rolls, a question of some interest to vendors and purchasers of houses is raised—viz., whether, when, after a contract has been entered into for the sale of a house, and before the completion of the purchase, the house is burnt down, the purchaser is entitled to recover from the vendor money which he has received from an insurance company under a policy which he had before the agreement for sale effected on the house, the purchaser, when he entered into his contract, not knowing of the existence of the policy, to which the contract contains no reference, and the insurance company knowing nothing of the contract for sale. The Master of the Rolls, conceiving himself bound by a decision of Lord Eldon in 1801, in the case of "Paine v. Meller" (6 "Ves." 349), and a decision of Vice-Chancellor Kindersley in 1864, in the case of "Poole v. Adams" (12 "Weekly Reporter," 683), held that the purchaser could not recover the money from the vendor. The purchaser appealed. Their Lordships (Lords Justices James, Brett, and Cotton), reserved judgment.

A CONTRACTOR'S CLAIM.—COMPETITION ESTIMATES.—BROWN V. THE BRIDLINGTON LOCAL BOARD.—This action was heard in the Chancery Division of the High Court of Justice, before Vice-Chancellor Sir R. Malins on the 17th inst., and was a builder's claim under a contract for the erection of two mortuary chapels and a keeper's lodge for the Bridlington Cemetery. The local board selected in competition Mr. Smith, of Nottingham, as their architect, and he prepared specifications, according to which he estimated that the buildings ought to be completed for £2,500. The plaintiff's tender of £5,912 was the lowest, but after cutting down the work to £4,788, it was accepted, and the work was to be completed by the 1st of January 1877, the date of tender being June 10, 1875. The defendants took possession on September 18, 1879, alleging that the contract had not even then been completed, and they now stated that they had expended £144 upon work which ought to have been done by the builder. The plaintiff represented that at that time, through alterations and additions directed by the architect, he had spent upwards of £10,000 upon the building, that the work was practically finished when he was deprived of possession, and that the contract would have been carried out in due time but for the new orders and directions, a masons' strike, and bad weather. He had received £4,235 7s. 8d., and held certificates from the architect for work done which would entitle him to a further sum of £1,238 18s. 7d., but he claimed about £6,000 beyond that. The defendants denied all liability for any payments beyond that which had been already made, and they had filed a counter-claim, by which they sought to set off against anything that might be found due to the plaintiff a sum of £1,960 as damages for delay in completing the contract. On the suggestion of the Vice-Chancellor it was arranged that, all charges and imputations of fraud being withdrawn, and the certificates and awards not being insisted upon as binding, there should be a reference to Sir Henry Hunt to determine, having regard to the circumstances of the case, how much, if any, money remained due to plaintiff. The costs were reserved.

A PARTY-WALL.— HACKMAN V. DAVEY.—This was an action recently tried at the Brighton County-court to recover £33 3s. 11d. under the following circumstances:—The plaintiff is a builder at Brighton, and he erected several houses in Hastings-road. Adjoining the last of the plaintiff's property defendant erected a house. The party-wall of the plaintiff's house was an ordinary one, erected partly on the plaintiff's and partly on the defendant's ground; and the defendant used it in the ordinary way to support his house. There was no agreement between the parties. Plaintiff thought defendant ought to pay part of the cost of the erection. His Honour said the defendant had a perfect right to use that portion of the wall built on his land for any purpose whatever, or even, if he choose, to split the wall down, taking away that portion which stood on his land, even if he rendered the remaining portion useless.—Verdict for defendant with costs.

NON-ACCEPTANCE OF ENGINEER'S CERTIFICATE.—The arbitration case of Hutchings and Berry v. the Corporation of Honiton was brought to a close after four sittings before Mr. E. Vigor on Friday. The plaintiffs contracted to construct works of drainage in Honiton from the plans of Mr. Ellis, engineer, who reported to the corporation that they had completed the work to his satisfaction. On behalf of the corporation it was contended that certain works had been omitted, amounting in cost to £6 5s. only, and plaintiffs not being able to get the money in full, brought the case now fully heard. The arbitrator has yet to give his award. It is stated that the costs will be many times the amount in dispute.

PAVEMENT LIGHTS—HAYWARD V. HAMILTON AND ANOTHER.—This case was argued on Wednesday in the Exchequer Division, before Mr. Baron Pollock and Mr. Justice Hawkins. This case was an action to recover damages for the infringement of a patent of the plaintiff's for improvements in pavement lights, and was tried before Mr. Justice Hawkins in November, 1879. His Lordship then directed a nominal verdict for the plaintiff with 40s. damages on the findings of the jury; but his Lordship did not enter judgment for either side. There were on Wednesday two cross-motions, one by Mr. Webster for judgment for the plaintiff, and another by Mr. Aston, who contended that the findings of the jury were really in favour of the defendants, and, in the alternative, for a new trial on the ground that the verdict was against the weight of the evidence. The plaintiff's contention is that his invention is novel and useful, no one having previous to his patent of 1871 constructed a strong iron frame flush with the pavement and utilised the old ship's light with glass prisms so adjusted as to let in a powerful light into cellars or store-rooms. His counsel urged that it was practically admitted at the trial the plaintiff's framework, &c., was useful and novel, and the jury found that it was new to glaze pavement lights in the manner set out in the plaintiff's specification, and that the defendants' framework and prisms were a colourable imitation of it. The defendants rely on the answer given to one of the questions put to the jury—viz., whether, having regard to the state of knowledge at the date of the patent, it was a new thing to form and arrange a prism so that the light would be thrown forward in one direction by making one of the sides of the prism upright, or nearly so, and the other side inclined to it at such an angle that the light passing through the upper surface may strike the inclined side and be reflected completely, or nearly so, within the prism, and issue from the upright, or nearly upright, side in the direction required: "Is that a new thing, having regard to the state of knowledge in 1871, the date of the patent?" Answer,—"No." The plaintiff's invention, therefore, it was contended, was not novel, and it could not be the subject of a patent. Something very similar had been done by Mr. Darker, by means of a prism, before the patent of the plaintiff. The form of the frame was old and the glass flange was old, and the defendants, by cutting a nick out of a glass prism placed in a frame, had only used the knowledge common to all the world and had not infringed the plaintiff's patent. After hearing the arguments of counsel and a full citation of the authorities, their Lordships gave judgment for the plaintiff with costs, granting also the injunction and account prayed for in the claim. The matter was, however, directed to stand over for 10 days, in order that the defendants' advisers might have an opportunity of seeing whether they would come to any settlement, or whether they would go to the Court of Appeal.

DISTRICT SURVEYORS AND THEIR FEES.—On Wednesday, at the Mansion House, Messrs. Trollope and Sons, builders, were summoned before Alderman Sir Andrew Lusk, M.P., at the instance of Mr. Collins, the Board of Works district surveyor for the eastern portion of the City, for having, as builders of premises at 27 and 28, Nicholas-lane, neglected to give notice to him within two days of the commencement of the work. Mr. St. John Wontner, solicitor, attended for the defence. The summons was taken out under the provisions of the 38th section of 18 and 19 Vic., chap. 22, notice having to be given by builders within two days of the commencement of the work to the district surveyor, containing particulars, *inter alia*, of the situation, area, height, and probable uses of the building. In this case Messrs. Trollope were the builders of 27 and 28, Nicholas-lane, in the ward of Langbourn, which was claimed by Mr. Collins as being a portion of his district. Mr. Wontner stated that the firm had pulled down old and erected fresh premises on the site in question. They looked at the list of district surveyors, and gave the notice to a Mr. Power, who they thought was the surveyor, and to this gentleman the firm paid the required fees. Mr. Collins said that Mr. Power was the surveyor of the adjoining ward of Candlewick, and therefore a mistake had been made by the defendants in giving him the notice. The buildings were within the ward of Langbourn, which was a portion of his (Mr. Collins's) district. Mr. Wontner said they had given the required notice when the buildings were commenced to Mr. Power, who was thought to be the proper officer. They had inquired at the Board of Works, but had been unable to get the question decided as to the proper district. The boundary of the two wards intersected the buildings. Mr. Power had inspected the premises and certified that all was correct. The penalty was recoverable under Jervis's Act, in which it was laid down that the proceedings must be taken within six months of the commission of the offence. He, therefore, took the objection that, as the buildings were commenced in April, the proceedings should have been taken within six months of that date. He complained that his clients had been summoned there on a criminal charge simply that a decision might be given as to who was the district surveyor. The Court was not called upon to decide that, but whether his client had committed a breach of the Act of Parliament in not giving notice. Mr. Collins could recover the fees paid to Mr. Power by suing him in the County Court. The Beadle of Langbourn Ward was called to prove that the premises were in that ward wholly and solely. Mr. Collins contended that he was the surveyor of that ward. After some further arguments, the case was adjourned.

CHIPS.

The Mayor of Salisbury (Mr. E. F. Kelsey, J.P.) is about to have a residence erected on the Milford Manor Estate in that town, the architect being Mr. J. O. Parmenter, of Southampton, the contract having been taken by Mr. John Barber, builder, of Brown-street, Salisbury.

At the St. Olave's district board of works last week a report was received from the works committee recommending that the costs incurred by the board in hiring carts, horses, and drivers, and extra labour, and other expenses incurred, through the default of the contractor, Mr. Reddin, to remove the recent heavy fall of snow, be charged against him. It appeared that the board's officers applied to Mr. Reddin for more carts to clear the streets, but the contractor failed to comply with the request. It was decided to charge the cost thus occasioned, £24 16s. 6d., against the contractor, and it being reported by the inspector that 121 streets were not properly cleansed, it was further resolved that a penalty of 5s. each be enforced for each of these streets. Several members urged the desirability of the board undertaking its own scavenging.

An Odd Fellows' hall in Hanworth-road, Hounslow, was opened on Tuesday. It is Gothic in style, seats 700 persons, and has been built from the designs of Messrs. Cooper, Son, and Miller, architects, of Reading.

A new chapel for the United Free Methodists was opened in St. George's-road, Truro, on Thursday week. The style of the building is Gothic, and it has a façade of Plymouth limestone, with granite and Bath-stone dressings. 600 sittings are provided, and the cost has been £2,250. Mr. James Hicks, of Redruth, was the architect, and Mr. J. Blight, of the same town, the contractor.

The foundation-stone of a new workhouse infirmary was laid at Mile-end Old-town on Tuesday. The building will accommodate 400 patients, and the contract for erection has been taken at £32,300.

Our Office Table.

AN agitation has once more been started in the City for roofing the Royal Exchange with glass. The wonder is how City men could have patiently put up with such an inconvenience so long. The proposed glass roof needs no discussion. Not a few of these who frequent the Exchange in the afternoon are elderly men accustomed to all the comforts of modern civilisation, and why they should have to be exposed to the inclemency of the weather as though they were night policemen or sentries on guard at Buckingham Palace, it would puzzle even the members of the grand Gresham Trust to discover. Since the last occasion on which the proposed system was seriously discussed, improved systems of glass roofing have been widely adjusted, which obviate many objections raised to the older methods. With these, those who have the custody of the Royal Exchange should make themselves familiar.

THE burning of stained glass has always been a very important part of that business; numerous failures from over-heating or not sufficient heating have been a constant source of trouble to the stained-glass artist. The old kilns for burning glass have been heated by coal, and the volumes of smoke sent forth for the six or eight hours required to get the proper heat have, since the Smoke Prevention Act, obliged many of the glass stainers to burn at night or be summoned for committing a nuisance. Messrs. Thompson Bros., of Leeds, have, with the assistance of a stained-glass artist, invented a gas kiln emitting no smoke, and, they claim, so completely fusing the outlines and shading, that in some cases it is difficult to say on which side the colour has been placed. Tiles are burnt and all kinds of glass bent by the same kiln. By this process a kiln 9ft. by 4ft. can, it is stated, be filled, burnt, and emptied three times in 24 hours, given four hours to heat and four hours to cool each kiln full of glass. The coal kiln can only be heated and emptied once in twenty-four hours.

THE sister obelisk to that on the Thames Embankment, presented to the Americans by the Khedive of Egypt, was safely set on its pedestal in the Central Park, New York, on the 21st of January. Three things in connection with the American obelisk contrast strongly with three others in connection with the one brought to England. The American engineers managed its transport and re-erection without any hitch, and yet do not seem to think they have accomplished anything miraculous; the individual who paid the cost insisted on his name being kept secret—though many people believe him to be Mr. W. H. Vanderbilt, who has done a good many other handsome things in the same unostentatious way; and, finally, the Americans contrived to find a site for the obelisk without quarrelling for months as we did, and up to the present have not embellished it with imitation sphinxes or brass corner-pieces. American art, engineering, and modesty, are so immeasurably behind our own, as we know, if all the world does not, that for once we can afford to feel small.

AMONG the evils resulting from the intermittent system of water-supply, and they are too well known to require reiteration, may be mentioned the waste that is hourly and unavoidably going on, and which, to a great extent, is impossible under the constant system. Mr. Parry, for instance, in his recently-published handbook, shows this clearly by a diagram indicating the number of gallons per hour flowing into a district each hour during the intermittent supply, from which it appears that during the intermittent service the consumption was at least 50 per cent. greater than an economically-controlled constant service. The diagram illustrates no exceptional case, and the pipes and fittings of the houses were examined periodically during the time, and the leakages repaired when discovered. A more remarkable instance is that afforded by Liverpool, when the drought in the summer of 1865 led to a restriction of the supply. Although the duration of the daily service was reduced to seven hours, the diminution of the total daily consumption from the change was only 5 per cent. instead of 70 per cent. The table given shows a striking increase of waste under the intermittent system, while the rate of consumption under the constant is now 22½ gallons per head per day.

FEW of the peers who argued the question of opening museums and galleries on Sundays, this week, seem to have troubled themselves to find facts on which to base their deductions. Here is one which ought to have some weight. In England and Scotland such institutions are kept fast closed. In Ireland, on the contrary, the National Gallery of Dublin is opened from two o'clock on Sundays until dusk, or until six o'clock in summer. The number of Sunday visitors amounts on an average to nearly half the whole free admittances of the week, ranging from 600 to 1,000, while the weekly average is something over 2,000. The visitors consist almost exclusively of the working classes, and are very well behaved, two policemen being quite sufficient to keep order. Of course, Lord Shaftesbury will at once connect the opening of the National Gallery in Dublin with the lawless doings of the Land League!

Epps's Cocoa.—Grateful and Comforting.—"By a thorough knowledge of the natural laws which govern the operations of digestion and nutrition, and by a careful application of the fine properties of well-selected Cocoa, Mr. Epps has provided our breakfast tables with a delicately flavoured beverage which may save us many doctors' bills. It is by the judicious use of such articles of diet that a constitution may be gradually built up until strong enough to resist every tendency to disease. Hundreds of subtle maladies are floating around us ready to attack wherever there is a weak point. We may escape many a fatal shaft by keeping ourselves well fortified with pure blood and a properly nourished frame."—*Civil Service Gazette.*—Sold only in Packets labelled—"JAMES EPPS and Co., Homœopathic Chemists, London."—Also makers of Epps's Chocolate Essence for afternoons.

CHIPS.

A new vestry is in course of completion for the church of St. Giles, Kingston, near Canterbury, the restoration of the chancel being already completed. Mr. Robert Davies, of 30, Dorset-street, Portman-square, W., is the architect, and Messrs. Sutton and Wood, of Canterbury, are the contractors.

The town council of Newport, Mon., have adopted a report from the free library committee, recommending the adoption of the plan of Messrs. Watkins and Sons for a new free library; the cost of execution is estimated at £3,000.

Messrs. Spalding and Evans, architects, of Queen Victoria-street, E.C., have dissolved partnership.

The vacant post of inspector of factories has been conferred on Mr. Henry Prior, secretary to the Amalgamated Society of Carpenters and Joiners.

Lamplough's Pyretic Saline is refreshing, most agreeable, and the preventive of FEVERS, BILIOUSNESS, SMALL POX, SKIN DISEASES, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill. *Use no substitute.*—[ADVT.]

Holloway's Pills.—No amount of wealth, no means of pleasure are of the slightest value without health. It is inconceivable how small a disturbance of the animal functions begets wretchedness, and how readily it may be rectified by a few doses of some purifying and regulating medicine, such as these world-renowned Pills, which are ever the sufferer's surest friend.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Royal Academy Lectures on Architecture, by Professor G. E. Street, R.A. No. V. "Thirteenth Century Architecture of France." 8 p.m.
Royal Institute of British Architects. "The Law of Light and Air." By T. Roger Smith. 8 p.m.

TUESDAY.—Institution of Civil Engineers. Discussion on "The Weight and Leading Dimensions of Girder Bridges." Paper on "Tide Gauge, Tidal Harmonic Analysis, and Tide Prediction." By Sir William Thomson, LL.D., F.R.SS., L. and E. 8. p.m.
Society of Arts. "The Languages of Africa." By R. N. Cust. 8 p.m.

WEDNESDAY.—British Archæological Association. "The Saxon Cross at Winwick, Lancashire." By J. Romilly Allen, F.S.A., Scot. 8 p.m.
Society of Arts. "Lighthouse Characteristics." By Sir Wm. Thomson, LL.D., F.R.SS. 8 p.m.

THURSDAY.—London Institution. "The Inside of an Insect." By the Rev. J. G. Wood. 7 p.m.
Civil and Mechanical Engineers' Society. "Steep Gradients v. Heavy Works." By J. B. Watton, A.M.I.C.E. 7 p.m.
St. Paul's Ecclesiological Society. "Suggestions for the Fabric of the Church in the Present Day." By E. B. Ferrey, F.R.I.B.A. 7.30 p.m.
Royal Academy. Lectures on Architecture by Prof. Street, R.A. No. VI. (final lecture). "Thirteenth Century Architecture of England." 8 p.m.

FRIDAY.—Architectural Association. "Cheap Churches." By Wm. White, F.S.A. 7.30 p.m.
Society of Arts. "The Results of British Rule in India." By J. M. Maclean. 8 p.m.
Royal Institution. "Elasticity Viewed as Possibly a Mode of Motion." By Sir William Thomson, LL.D., F.R.SS. 9 p.m.

Doulting Freestone and Ham Hill Stone of best quality. Prices, delivered at any part of the United Kingdom, given on application to CHARLES TRASK, Norton-sub-Hamdon, Ilminster, Somerset.—[ADVT.]

McLACHLAN & SONS, 35, St. James's-street, S.W. Builders, Decorators, and House Painters. Designs and Estimates. General Repairs and Alterations Executed. Experienced Workmen always in readiness, and sent to any part of the country.—[ADVT.]

BATH STONE.
SUMMER DRIED,
CORSHAM DOWN,
100,000 Feet Cube.
PICTOR & SONS, BOX, WILTS.
[ADVT.]

TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender—it adds to the value of the information.

AYLESBURY.—For the erection of six semi-detached villas in the New-road, Aylesbury, for J. E. Taylor, Esq. Mr. G. Luckett, architect:—

Ball, Aylesbury	£2,400	0	0
Kingerlee, Banbury (accepted) ...	1,785	0	0

DARTFORD.—For farm-buildings at the Temple Farm, Dartford, for the Right Hon. Lord Tredegar. Mr. Robert Griggs, architect:—

Waller, Dartford	£1,845	0	0
Crockett	1,675	0	0
Patman and Fotheringham ...	1,582	0	0
Blake, Gravesend	1,525	0	0
Braid and Co.	1,425	0	0
Sharp & Sons, Dartford (accepted)	1,414	0	0

DERBY.—For the erection of the new church of St. Chad, at Mill Hill, Derby. Mr. H. G. Turner, New Court Chambers, 57, Chancery-lane, W.C., architect. Quantities by Mr. R. Waite, Duffield:—

Collins, T., Tewkesbury	£5,900	0	0
Hair, J., Church Gresely	5,561	10	0
Thompson, E., Derby	5,410	0	0
Walkerdine, W., Derby	5,325	0	0
Webbe, N., Buxton...	5,077	0	0
Walker and Slater, Derby ...	4,990	0	0
Allen, H. F., Leicester	4,949	0	0
Bromage, F., Leek	4,947	0	0
Hewitt, G., Derby (accepted) ...	4,700	0	0

[Total number of sittings, 796; cost per sitting under £6; cost per cubic foot about 4½d.]

GREENWICH.—For removing iron school buildings from Goodson-road and re-erecting in Nynehead-road, for the London School Board:—

Pritchard, G. S.	£299	0	0
Jerrard, S. J.	219	0	0
Hook and Oldrey	206	0	0
Atherton and Latta, Chrisp-street, Poplar (accepted)	199	0	0

GREENWICH.—For erecting hoarding round site of new school in Nynehead-road, Clifton-road, for the London School Board:—

Pritchard, G. S...	£160	0	0
Hook and Oldrey	93	0	0
Atherton and Latta	85	0	0
Jerrard, S. J., Lewisham (accepted)	74	0	0

GT. YARMOUTH.—For alterations and shop-front, King-street, Great Yarmouth, for Mr. G. Bristow. Mr. J. W. Cockrill, architect, Glencoe House, Gorleston, Great Yarmouth:—

Carpenter and joiner:—			
Cooper, Yarmouth	£249	10	0
Salmon ,, ...	237	10	0
Springall ,, ...	229	0	0
Bray ,, ...	211	0	0
Norfor ,, ...	210	0	0
Want ,, (accepted) ...	205	0	0
Painter, plumber, and glazier:—			
Woolverton and Son, Gt. Yarmouth	£119	6	0
Rainer, Gt. Yarmouth	112	16	0
Norman and Son, Gt. Yarmouth ...	105	10	0
Green, Southtown	105	0	0
Goffin, Gt. Yarmouth (accepted) ...	93	17	0

HORSHAM.—For entrance-gates to the cemetery, for the burial board:—

Littlefield...	£17	0	0
Etheridge, E. (accepted)	14	9	0

LONDON, N.W.—For the construction of sewerage works at Camden Town, Kentish Town, and Holloway, for the Metropolitan Board of Works. Sir Joseph W. Bazalgette, C.E., engineer:—

Williams and Wallington ...	£99,900	0	0
Dickinson	97,000	0	0
Dunmore	86,591	0	0
Kirk and Randall	75,000	0	0
Webster	74,320	0	0
Wall, Bros.	73,640	0	0
Crockett	68,634	0	0
Hook and Oldrey	68,500	0	0
Killingback	67,550	0	0
Pearson and Son	65,950	0	0
Nowell and Robson	64,950	0	0
Mowlem and Co.	63,000	0	0
Smith, J. M....	59,900	0	0
Kellett and Bentley	58,000	0	0
Cook and Co.	53,976	0	0
Rigby (accepted)	52,911	0	0

LONDON.—For new oak shop-fittings, counter, &c., at 121, Oxford-street, W., for Mr. J. H. Hill. Mr. Wm. Goldsmith, architect:—

Treble and Co....	£674	0	0
Sage	510	0	0
Drew and Cadman	439	0	0
Lascelles...	423	0	0
Berridge and Traise (accepted) ...	375	0	0

LAVERSTOKE.—For rebuilding the "A" mill, Bank of England Paper Mills, for Messrs. Portal. Mr. W. H. Worsam, architect and surveyor, 45, Jewry-street, Winchester. Quantities supplied by the architect:—

	Tender.	Old materials.	Total.
Fielder & Son, Winchester	£1,295 0 0	£70 0 0	£1,225 0 0
Tigwell, J., Basingstoke ...	1,110 0 0	65 0 0	1,045 0 0
Sanders, H. I., S'hampton*	1,113 0 0	70 0 0	1,043 0 0

* Accepted.

LAVERSTOKE.—For pair of cottages, for Messrs. Portal. Mr. W. H. Worsam, architect and surveyor, Winchester. Quantities supplied by the architect:—

Fielder and Son, Winchester ...	£555	0 0
Tigwell, J., Basingstoke	520	0 0
Sanders, H. I., Southampton* ...	519	0 0

* Accepted, subject to reductions.

PRESTON.—For the erection of co-operative stores, school-lane, Walton-le-Dale. Messrs. Longworth and Gardner, architects, Preston:—

Accepted tenders:—

Brickwork, &c.:—
Myerscough and Marlow, Bamber Bridge.

Masonry:—
Sparling, T., Preston.

Slating and flagging:—
Nickson, T., Preston.

Plasterer:—
Jones, R., Preston.

Plumbing, glazing, and painting:—
Corbishley, J., Preston.

Carpentry and joinery:—
Hill, G., Prest n.

Ironwork:—
Dryden, W., Preston.

STOKESBY, NORFOLK.—For master's house, for the Stokesby and Herringby U.D. School-board. Mr. J. W. Cockrill, architect, Glencoe House, Gorleston, Great Yarmouth:—

Beach, Yarmouth	£382	0	0
Kemp, Gorleston	379	0	0
Bray, Yarmouth	377	0	0
Balls ,, ...	366	0	0
Poxon ,, ...	354	0	0
Withers ,, ...	339	0	0
Springall ,, ...	335	0	0
Want ,, ...	327	0	0
Rand and Cooper, Yarmouth ...	320	0	0
Poland, Stokesby	316	0	0
Salmon, Yarmouth	304	0	0
Newman, Yarmouth	297	0	0
Harbord, Gt. Yarmouth (accepted)	294	0	0

SOUTHWARK AND ROTHERHITHE, S.E.—For the construction of sewerage works from Rotherhithe New-road to Southwark-street, for the Metropolitan Board of Works. Sir Joseph W. Bazalgette, C.E., engineer:—

Dickinson	£79,700	0	0
Williams, Son, and Wallington	78,700	0	0
Crockett	75,752	0	0
Mayo	75,000	0	0
Webster	73,500	0	0
Hook and Oldrey	69,850	0	0
Mowlem and Co.	69,000	0	0
Cook and Co.	65,000	0	0
Nowell and Robson	65,000	0	0
Kellett and Bentley	59,000	0	0
Pearson and Son (accepted) ...	55,500	0	0

STORNOWAY, ISLE OF LEWES, N.B.—For woodwork in curing-premises, for J. R. Nutman, Esq. Mr. J. W. Cockrill, architect, Glencoe House, Gorleston, Great Yarmouth:—

Salmon, G. E., Great Yarmouth ...	£330	0	0
Springall, R., Gt. Y'mth (accepted)	312	0	0

[The walls to be executed in concrete by Messrs. Chas. Drake and Co. with their patent apparatus.]

TILBY AND ORMESBY, NORFOLK.—For two cottages and farm-buildings, for Mr. Chas. Lucas, Tilby. Mr. J. W. Cockrill, architect, Glencoe House, Gorleston, Great Yarmouth:—

Withers, J., Blofield, near Norwich (accepted) £834

UPPER CLAPTON, N.—For cookery classroom at the school in Rendlesham-road, Upper Clapton, for the London School Board:—

Tongue, W., Plumstead (accepted) £240 0 0

WANDSWORTH, S.W.—For a school providing accommodation for 800 children, to be erected in Fountain-street, Wandsworth, for the London School Board:—

Higgs and Hill	£8,996	0	0
Hook and Oldrey	8,993	0	0
Lathey, Bros.	8,849	0	0
Kirk and Randall	8,792	0	0
Wood, F and F. J....	8,751	0	0
Nightingale, B. E.	8,481	0	0
Atherton and Latta	8,468	0	0
Jerrard, S. J., Loampit Vale, Lewisham*	8,373	0	0

[* The Education Department requiring that the school should accommodate 1,200 in lieu of 800 children, a revised tender from Mr. Jerrard, based on the cont act schedule of prices, was obtained, amounting to £10,268, and has been accepted. Cost of site (area 37,340 square feet), £4,961 8s. Cost of (*a*) school buildings only, including closets, £8,245; (*b*) tar pavement and playground, £581; (*c*) boundary walls and gates, £496; (*d*) covered playgrounds, £200; (*e*) teachers' rooms, £300; (*f*) schoolkeeper's residence, £350; (*g*) raising building 2ft., £96: total, £10,268. Cost per head of (*a*), (*b*), and (*c*), £7 18s. 8d.; total cost per head, £8 11s. 1d.]

TOLLINGTON PARK.—For new schoolroom and alterations to Nos. 49 and 51, Tollington Park, for Mr. R. Wills. Mr. H. F. Stringer, architect:—

Harold	£1,334	0	0
Bristow	1,261	1	6
Pocock	1,260	0	0
Hewett	1,153	0	0

WHITSTABLE.—For the erection of a new infant-school, for the school-board:—

Lawson, J.	£895	0	0
Hughes, J.	795	0	0
Foad, C.	742	12	0
Harnett, W.	721	0	0
Porter, T.	694	0	0
Cornelius, T. (accepted)	678	0	0

WOLVERHAMPTON.—For enlargement of workhouse;—

James, T., Wolverhampton ...	£3,076	0	0
Vale, T., Hartlebury	2,886	10	0
Millward's Executors, Dudley ...	2,873	0	0
Ham, T. and S., Wolverhampton	2,775	0	0
Barnsley and Sons, Birmingham	2,760	0	0
Bennett, W. T., Birmingham ...	2,725	0	0
Evans, D., Wolverhampton ...	2,694	17	0
Woodward, H. J., Birmingham...	2,693	15	0
Garlick, J.	2,661	0	0
Wiley, W., Wolverhampton ...	2,643	10	0
Rollins, B., Wolverhampton ...	2,638	16	8
Trow and Son, Wednesbury ...	2,560	0	0
Bradney and Co., Wolverhampton	2,417	0	0
Stockton and Sons, Oldbury ...	2,439	0	0
Jones and Sons, Sedgley	2,400	0	0
Tatlow, J. T., Wolverhampton ...	2,370	0	0
Ford and Sons, Wolverhampton...	2,300	0	0
Gough, H., Wolverhampton ...	2,255	0	0
Bedford, A. C., Wolverhampton	2,200	0	0
Teece, S., Darlaston (accepted) ...	2,078	0	0

BEST BATH STONE.

Westwood Ground, Box Ground, Combe Down, Corsham Down, and Farleigh Down.

RANDELL, SAUNDERS, & CO., LIMITED,
CORSHAM, WILTS.

Bath Stone.—Every description and the best quality supplied direct from his own Quarries by

ISAAC SUMSION, NEWARK STREET, **BATH.**

Quarryman and Stone Merchant. Established 1791. Prices, delivered to any part, furnished on application. —[ADVT.]

WANTED.

GUILDFORD UNION.
RURAL SANITARY AUTHORITY.
APPOINTMENT OF INSPECTOR OF NUISANCES.

The Sanitary Autho ity of the above Union are desirous of APPOINTING an INSPECTOR of NUISANCES for their District, containing approximately an area of 65,046 a res, and a p pulation in 1871 of 21,871, at a salary of £130 per annum (to include travelling and other expenses).

Applicants must possess a thorough knowledge of the duties of Inspector of Nuisances as prescribed by the Local Government Board and the Public Heal'h Acts, and preference will be given to a person who is acquainted with surveying and levelling and construction of buildings, and able to carry out Bye Laws made under Urban Powers.

The appointment will be made for one year only, and will be subject to the approval of the Local Government Board. The duties to commence at Ladyday next.

The person appointed will be required to reside in Guildford, Godalming, or the District, and to devote his whole time to the duties of the office.

Applications to be made by letter only, in candidate's own handwriting, stating age, experience, and present employment, accompanied by not more than three testimonials of recent date, and to be sent (prepaid) to me on or before WEDNESDAY, the 9th March next, and selected candidates will have notice to attend on the 12th March next, when the election will take place.

By order of the Authority,
MARK SMALLPEICE, Clerk.

Guildford, 19th February, 1881.

LEEDS CORPORATION WATER-WORKS.

WANTED, a SUPERINTENDENT of the Reservoirs and Works outside the Borough; salary, £110 per annum, with house at Fewston Reservoir, rent free.

For duties and other particulars, apply to Mr. Edward Filliter, Engineer to the Water Works, 16, East Parade, Leeds.

Applications in writing, stating age and previous experience, and accompanied by not more than three testimonials, to be sent in not later than SATURDAY, the 5th March, addressed to "The Town Clerk, Town Hall, Leeds," and endorsed "Water-works Superintendent."

Canvassing members of council by any candidate is strictly forbidden.

Any candidate who canvasses will be disqualified.

By order,
GEORGE W. MORRISON, Town Clerk.

WANTED, an ACCOUNTANT, thoroughly experienced in measuring and making up painting and decoration accounts, must be under 35 years of age.—Apply, by letter only, to Messrs. CRACE and SON, 38, Wigmore street, W.

WANTED, for the Hornsey Local Board, a JUNIOR CLERK in the Surveyor's Office. His chief duties will be to keep the books incidental to such department. Good handwriting indispensable. Commencing salary £70 per annum.

Applications stating age, with full particulars, together with not more than three testimonials, to be sent to the undersigned on or before SATURDAY, March 5th.

R. C. C. WHITE, Clerk.

Local Board Offices, Southwood-lane, Highgate, London, N.

ARCHITECT and SURVEYOR'S ASSISTANT requires RE-ENGAGEMENT, well up in general routine; 6½ years' experience; highest references.—ARTHUR EATON, Etwall, Derby.

AN ARCHITECT desires an ENGAGEMENT, age 36, Perspective, Details, Specifications, &c.—Address, T. 16 Clarence-road, Leyton, London, E.

WANTED.—An Architect's Assistant desires an ENGAGEMENT, seven years' experience; first-class references.—Address, C. J. L., No. 18, Weise-street, Bristol.

TO COMPETING ARCHITECTS.—An accomplished Competition Draughtsman is at liberty to assist the above, Perspectives, Ink or Colour Designs, Detail and Working Drawings.—BEDFORD, 103, Guildford-street, W.C.

ASSISTANCE rendered to Competing Architects and others. Drawings prepared in own office, or otherwise, from rough sketches. Perspectives in ink; terms moderate.—GAMMA, 48, Theobald's-road, W.C.

TRAVELLER WANTED, calling upon Builders, Decorators, and Shop-fitters in the Suburbs and Country, to add a commission for Plate and Sheet Glass.—Address, E. S. W. 84, Deacon's Advertising Offices, 154, Leadenhall street, E.C.

ARCHITECTURAL DRAUGHTSMAN (first-class), requires immediate RE-ENGAGEMENT in London. Perspectives, coloured and etched (good style); well up in competition and all other drawings; good experience; specimens.—K., 82, Lamb's Conduit-street.

DESIGNER of the Highest Class of Artistic Mural Decoration.—A permanent ENGAGEMENT is offered to a skilful Draughtsman thoroughly conversant with Renaissance Ornament of the best periods, and possessing a good knowledge of Figure Drawing.—Apply, with drawings, to W. B. SIMPSON and SONS, Decorators, Art Tile Painters, St. Martin's Works, 100, St. Martin's-lane, London, W.C.

ARTIST, who Designs and Paints Figure and Monumental Art, Stained Glass, Art Tiles, and all kinds of Artistic Designing in the Gothic and Classic styles, offers his services for the above work. Highest references.—X., 29, Gladstone-street, Southwark, London.

INTERNATIONAL MEDICAL AND SANITARY EXHIBITION

to be held at South Kensington during the International Medical Congress, 1881.

For Particulars and Forms of Application for Space apply to the Secretary Parkes Museum of Hygiene, University College, Gower-street, London.

Applications for space must be made before March 31st.

SIR JOHN SOANE'S MUSEUM, 13, LINCOLN'S INN FIELDS.

ANTIQUITIES, PICTURES, AND SCULPTURE.

Open free from 11 to 5 on Tuesdays and Thursdays in March, and on Tuesdays, Wednesdays, Thursdays, and Saturdays in April May June July, and August

Cards for Private days and for Students to be obtained of the Curator at the Museum.

EVENING LECTURES to WORKING MEN.
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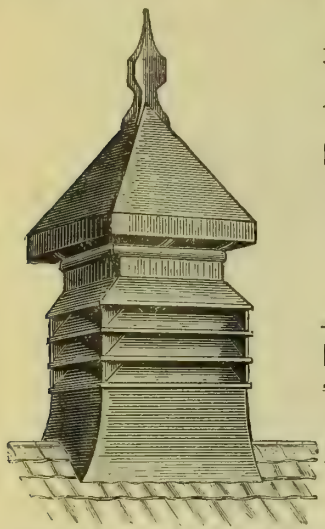

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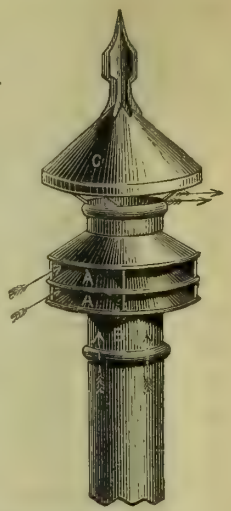

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Tenders on the form supplied to be delivered at the Chief Office, No. 6, Finsbury-square, on THURSDAY, March 3rd, at half-past two precisely by the parties, who must attend personally.

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R. T. KINGHAM, Secretary.

6, Finsbury-square, February 23rd, 1881.

TO BUILDERS and CONTRACTORS.

Persons willing to TENDER for the BUILDING NEW SICK-WARDS at the Isle of Wight Union Workhouse, are requested to forward their names to the architect, Mr. WILLIAM T. STRATTON, 31, Holyrood street, Newport, Isle of Wight, not later than on WEDNESDAY, the 2nd March next, after which date no application will be attended to.

18 February, 1881.

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Sealed Tenders, endorsed, and directed to the Vestry, and marked outside with the subject of the particular Tender, must be delivered at the Vestry Hall not later than 3 o'clock on FRIDAY, the 4th March.

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HENRY J. SMITH, Clerk to the Vestry.

Vestry Hall, Kennington Green, February 21st, 1881

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TENDERS are invited for the ERECTION of FARM BUILDINGS at Blanch Farm, South Mimms, near Barnet, N., for Major Naper. Drawings, specification &c., may be inspected at the office of Messrs. BROOKING and NELSON, Architects and Surveyors, High-street, Barnet, N.

Tenders to be sent to such office by March 14th next.

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TENDERS are invited for ADDITIONS AND ALTERATIONS to the "The Limes," East Barnet, for H. M. Jenkins, Esq.

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By Order,

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Board Offices, Old Charlton.

21st February, 1881.

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The said Plans and Estimates to be addressed to "The Chairman of the Committee, Melton Asylum, Woodbridge," not later than the 24th March next.

The Committee do not bind themselves to accept any Plan or Estimate.

CHERRY, Clerk of the Peace.

County Hall, Ipswich, 24th February, 1881.

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19th February, 1881.

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THE BUILDING NEWS.

LONDON, FRIDAY, MARCH 4, 1881.

DESIGNING IN THE SOLID.

MR. C. BRUCE ALLEN'S letter, in the BUILDING NEWS of the 4th of February, gives us the opportunity of putting together a few thoughts on the subject of which he has been the able and persevering exponent. And, first of all, it may be noted that the theory about the production of art-work with which he, and subsequently some other writers, have made us familiar, seems to consist of two parts, not necessarily inseparable. The first part is, that solid forms should be designed in the solid, and not by mere flat representations of them; the second part, if this does not belong, as an extreme view, rather to some of Mr. Allen's imitators than to himself, is that all art-work, from the largest to the smallest, ought necessarily to be designed by the very men who execute it. We think there are cases in which both parts of the theory are true, cases in which neither is true, and cases in which one only is true. In small works of the higher class, among which may be included figure-sculptures, decorative carving, and non-geometrical ornament of all sorts, perfection can only be expected when the design is first modelled instead of being drawn, and when the designer is the very man who is finally to execute it. Even here, however, as everywhere else in the world, to find the right path is not so easy as it looks; and here, as everywhere else, there is the danger that in following to its consequences one right principle, we shall forget and trample on another no less right and important. For instance: if the sculpture, or carving, or ornament is to form part of a building, as the best sort of all these things once did and still should do, it is not enough that they shall be good in themselves; it is still more important that they shall be fit for their place. Hence it may be necessary either to do without them altogether, which in these times would often be the wisest thing, or to put up with an inferior excellence in the minor detail, rather than spoil the harmony of the composition as a whole. In the ages of perfect art, the architect and the sculptor, the architect and the carver, the architect and the decorator, were alike in tastes and aims; their works naturally agreed with each other, for they all worked, all their lives long, in one and the same style. Now, on the contrary, almost every architect has or tries to have, a style of his own, and finds it hard enough to meet with subordinate artists whose work will do anything but painfully jar with it. From the most ambitious to the least ambitious of modern structures—from the Albert Memorial, where the sculpture almost makes us wish the architecture away, down to a multitude of humbler examples, where we are led to wish, conversely, that the architect had turned out the carver, this want of harmony stares us in the face. Decoration is, after all, only the sauce where architecture is the dinner; and the question is, Shall we have a well made sauce that will spoil the meat, a badly-made sauce that will agree with it, or no sauce at all? A prudent man is likely to choose the last course, as the least of the three evils; and thus the case in which both parts of Mr. Allen's theory are true becomes one in which few architects of the day are able to act on his principle.

There are cases, however, and very numerous cases, in which neither part of the theory seems to hold good. All work that consists only of geometrical forms can be worked perfectly from drawings of those forms. There is only one right way of working a given form of this class, and the right way is the same for every workman. Nothing has to be left to his taste, or judgment, or discretion: he has only to do his work in a workmanlike way, and the intended result will come of itself. That this should be so seems positively painful to some writers on the subject. They picture every workman as a born artist, brimming over with fancy, invention, and originality; and it grieves their very hearts to think of such a man passing year after year in mere mechanical work. Mechanical work, however, is just what the majority of people like: far more men are made for doing than for thinking. How many "neat men" are there to one inventive architect? One would like to ask these sympathetic writers how many born artists they meet with amongst their own acquaintance, amongst the people they go to business with, the tradesmen who supply them, the servants who wait on them, and why they think that working men, who, as we all know, are "our own flesh and blood," should be so incomparably more artistic than other men? It is no more necessary, however, that every workman should be by nature an artist than that every soldier should be by nature a strategist. Plenty of other endowments than these are needed before a successful building or a successful campaign could ever be carried out; endowments which, if less showy, are quite as indispensable, and which are wanted by men and supplied by nature, in the proportion of something like a thousand to one of the showier ones. But the curse of our time, to use language which is no stronger than it is true, is that everybody wants to be at the top of the tree, and that everybody of a benevolent disposition wants to pull everybody else up there also. It is the time in all departments, commercial, social, and artistic, and in the latter, which is the only one with which we have here to deal, is the cause of innumerable evils. We ought to adopt the highest style of architecture, people tell us, and the highest style of decoration, and they do not stop to ask whether the one will be congruous with the lowest purposes, or the other producible by the lowest type of decorators. Returning, however, to our subject, it may be said, with regard even to geometrical forms, that in old examples there is a certain life and freedom in their arrangement which is rarely found in work of our own day; and that this shows that a good deal of liberty must have been left to the workman, even here. We admit the life and freedom, but we think it less likely to be due to the workman than to the architect. An architect without a contractor, free to modify his building from day to day as he watched it growing, was a very different being from the modern contractor-ridden architect, bound to "prophesy" his whole building before a stone of it is laid, and to live in bondage all his days through fear of extras. If architects could, one and all, renounce their pretensions to the gift of prophecy, could get rid of the fetters in which contracts tie them, and could build, as their predecessors did, just as much or as little as the money in hand would admit of, we might see life and naturalness in architecture once more.

This brings us to the third case, in which we consider that one only of the principles which we understand Mr. Allen to insist on is either true or practicable. This is the case of large art production, such as entire buildings and the like, which are far too vast to be executed by one man. It is inconceivable to us that the general design, the all-pervading idea, the indivisible soul, which gives unity and almost personality to every great architectural work, could ever have been made up by the contributions of a multitude of workmen. That those workmen who were fit for it once had more liberty of design than it is possible under the conditions of to-day to give them, is what every one readily admits; but their liberty must have been in minor details, not in main lines and masses. It is no easier to believe that Lincoln or Salisbury, Laon or Coutances, was designed bit by bit amongst a hundred masons, than to believe that Hamlet was composed by a company of players, who each wrote his own part. When we speak, therefore, of renouncing pretensions to prophecy, we mean prophecy of details—prophecy of cost—not of that general pre-arrangement of line and mass, which must needs have existed in the case of every building worthy to be called architectural. But a building is a solid thing, and we agree with Mr. Allen that it ought to be designed in the solid. Elevations do not show it as it is, and perspectives, even rigidly accurate ones, only show it from a single point, whereas it will be seen from an infinity of points, far-off and near. Designs ought without doubt to be modelled first of all, rather than sketched, though geometrical drawings would be necessary in the after-stages of the work, just as they now are. This is so desirous, that models would probably be in universal use, but for two or three unfortunate circumstances. On existing systems they are tedious to make and difficult to alter and experiment on. If they show much detail (which in reality they seldom need do for the architect's purpose) they are very costly, and, worst of all, they are misleading and unattractive to clients. A showy view, with "men and women and prancing horses," would carry off a competition from the most admirably-studied model, provided no professional assessor were called in. Before we can design our buildings in the solid, and so avoid half the abortions that disfigure our streets, we must first discover a rapid, easily-altered way of sketching in model, and we must next insure that our sketch-models will be adjudicated on by men competent to understand them.

THE INSTITUTE PRIZE DRAWINGS.

THE drawings submitted in competition for the Institute prizes, are, generally speaking, up to the average of merit, though this time the Tite prize has elicited the highest talent. The Soane medallion and £50 prize, it will be remembered, was offered for the best design for a provincial county-court, a subject of sufficient practical utility to bring out the planning capacity of students, while possessing enough public character to demand, in its composition, some regard for architectural treatment. We can hardly congratulate the competitors for this prize in the result of their labours, and the Council of the Institute will not find the task of selection, we fear, a very easy or pleasant one. "Utility," placed in a conspicuous position, is a massively-treated building of Renaissance character, in brick and stone, not without points; but the end stair-turrets, carried up with conical roofs, do not add to the architectural impression. The plan is fairly contrived, though we hesitate to accept the corridor arrangement, with the circular staircases at either end, as the best planning. The entrances at each end, one for the public and the other for the judge, are convenient, and the situation of the registrar's public office, accessible from the public entrance and corridor, is also satisfactory. The county-court is on the first floor, and occupies the front part over the registrar's offices, lighted by front windows, and well approached by the staircases. Its dimensions are 40ft. by 30ft. 6in. The judge's retiring-room is over his entrance, and over the other entrance a vestibule is obtained for

the public. The bailiffs', waiting and witnesses' rooms are on the other side of corridor. The detail of this design is wanting in refinement. "Tendez la Main Droite" is an able and well-grouped Gothic design, with a good tower-entrance, and some fair detail. The public vestibule is made the principal feature in the plan, and occupies a large area in centre. A boldly-planned staircase is placed at the end near the entrance, and gives access to the court above. The registrar's room opens from the vestibule on the inner side, and the waiting-rooms, &c., are, at least, in serviceable proximity to the court. Another Gothic design "Ad Rem" is spoilt by some heavy details; the corner pinnacles to gables have a stumpy look, and rather detract from the general design, which is conceived in a foreign spirit. The court on the first floor is well approached by a flight of stairs leading from the waiting-hall below, and the registrar's offices are in good positions; but we do not like the separate building, or annex, thrown out behind for witnesses' rooms, nor the lighting of corridor, which latter is not very clear. Next to this is a gloomily-sullen Gothic design, conceived in a remarkably austere manner, and rather satirical in its unadorned nakedness. Well might the author motto it "My Deeds upon my Head"; it is certainly heavy and prison-like enough to remind the luckless debtor of the severity of the law. The design bears resemblance to some Mediæval Italian fortress in its lofty crenellated tower, and the windows are reduced to mere slits. In plan, the author shows an immense waiting-hall, the court being over it, approached by stairs at one end. One of the cleverest Classic designs is that of "Set Square." The plan and composition are both symmetrical; a central projecting feature crowned by a pediment emphasises the court, which is placed transversely, and forms the axis of the building, the judges' and solicitors', and other rooms, forming right and left wings in front. The ground-floor is nearly all vestibule and staircase and arcaded corridor, the private offices being in front, but the registrar's position is certainly out of the way. There is a Greek feeling in the detail; the composition is quiet and dignified, though the plan is hardly practical. "Quadratus," in a Classical Doric style, is also a symmetrical composition, heavy and too monumental in treatment. Here, also, the court is made the central feature, crowned by a flat-hipped roof, and having a Doric tetrastyle portico in front. A central entrance vestibule and circular-ended staircases are prominently emphasised in elevation; a good outline perspective, taken from a lofty point of sight, accompanies the drawings. "Equity" has some good drawing. It is in Italian Gothic, heavily treated, and its chief fault is a want of coherence in the composition. The author places the court at one end; the entrance and hall and corridor are not happily managed. "Hic Mihi Panis," "Try," an unfinished Gothic sketch with lofty tower; and "Celeriter," another half-finished perspective drawing, are also exhibited.

The design under motto "Forum," for Sir W. Tite's prize, leaves no choice for the committee of selection. It is undoubtedly an able contribution both in drawing and composition. The subject is the interior of an exchange, certainly one affording scope for architectural capabilities. The author shows a central hall 120ft. square, surrounded by corridors, these being separated by arcades with two orders of columns. At one end is a grand approach and staircase, the latter forming a distinct projection from the hall. A very clever sectional perspective through the hall and vestibule, shaded in India ink, is exhibited, which thoroughly explains the design. The hall is lighted partly by a domical roof, divided into nine compartments, each having a lantern, partly also by clerestory windows above the arcaded galleries. The details and sections are admirably drawn. "Huguenot" is the motto of a design of plainer character, Italian, of course. The proportions of central court are not happy, and the attic pilasters at the ends carrying the lantern beams look very weak. There is a wide arched recessed entrance. "Mens" is an elliptical vaulted hall or exchange, the arcade being adorned by the Ionic order. The plan is a long parallelogram, and the best drawing is the tinted perspective. "Honos alit Artes" is a very florid Italian design, with portico and lofty tower over entrance, the hall being lighted through a quadrangular dome or lantern, having iron ribs.

The Grissell medal this year is offered for a design for "tower and steeple." "Contendo" is the best design. It is an elaborately-drawn 15th-Century Gothic tower and spire, of good outline, with a section to a large working scale, and a cleverly-drawn view from belfry-floor, looking up, showing the "squinches." "Simplicity" is another contribution of merit; the ink sketches showing different stages of the spire and staging, &c., are creditable to its author; and "1881," is a pencil sketch of less merit and completeness. It must be remembered this prize is awarded mainly to encourage constructive knowledge and detail.

THE BURLINGTON FINE ARTS CLUB.

A COLLECTION of engravings in mezzotinto is now on view at the Gallery of the Burlington Fine Arts Club, arranged to illustrate the history of that art, from the earliest work of Von Siegen, the supposed discoverer of the art, down to the time of David Lucas. Little is definitely known of the origin of the art of mezzotinto engraving. Many writers ascribe the invention to Prince Rupert Palatine, of the Rhine, who died in 1682; the "Parentalia" speaks of Sir Christopher Wren as the originator, he having communicated it to Prince Rupert. In the introduction to the catalogue of this collection, a sketch of the history is furnished, which gives the credit of the invention to Ludwig von Siegen, to whom is ascribed the first plate scraped in mezzotint, which forms No. 1 of the collection. It is a portrait of Amelia Elizabeth, Landgravine of Hesse, and is dated 1642. Another is the Holy Family, after A. Caracci. Of Prince Rupert's work five specimens are exhibited, chiefly figure-subjects. The writer of the catalogue thinks Siegen communicated the discovery to Rupert, who was an ingenious and artistic Prince. He at least introduced the art into England after the Restoration. The Head of the Executioner (3), Magdalene in Contemplation (5), and the portrait of the Prince, are all exceedingly characteristic, and indicate the first methods of execution. The features are very expressive.

Many examples in the gallery serve to indicate the manner of working pursued by different artists. In No. 69, a portrait after Kneller, the face is the only part-finished, the coat and wig being drawn in white; the rest of the ground is dark. Henri Gascar's work, No. 21, "Duchess of Cleveland," is highly finished, but the ground rather coarse. The portrait of Samuel Butler, author of "Hudibras" (24); that of Jan Steen, in brown, 43, and George White's portrait of Jean Baptiste Monoyer (52), are all suggestive examples; the latter shows a crispness and precision of manner. This artist engraved after Lely, Kneller, and others. Of George Vertue's work there is one specimen, Portrait of William II., when young—a delicately-drawn portrait of the youthful prince. We also note No. 72, Peter van Bleeck's portrait of Rembrandt; No. 79, portrait of Lady Grammont, after Lely; No. 84, a mezzotint by Edward Fisher, in "first state," a fine brown print; a few works of John Dixon, in his forcible and deeply-toned manner; of James Watson, remarkable for their colour and gradation of features, Nos. 115, 116; of Richard Earlom, two exquisitely-finished fruit and flower pieces (120, 121); of Williams Ward (161); T. Goff Lupton (188, 189), and a few admirable mezzolints of landscape subjects by George Clint, Easling, J. M. W. Turner—also a work by John Watts, a powerful artist. The examples, with the exception of a few landscapes, are all portraits and figure compositions.

We have only glanced at a few of the more striking mezzotints in the gallery. An examination of them will convince any one of the beauty and delicacy of this mode of representation. The very manner the mezzotint is produced, the removal of the "ground" by degrees as the half-tints or the highest lights are required, this being done by the scraper, and the very few impressions that can be obtained from the copper-plate, are enough to show the value of the process in the hands of a true artist, and the great rarity of fine examples of the art. Resembling the finest India ink or sepia drawings, and having, to our minds, a degree of delicacy in light and shade and gradation unknown to other kinds of engraving, the art approaches painting, and its productions will always hold a high position.

ENGINEERING IN SOUTH AFRICA.

SOUTH AFRICA—generally so-called—consists of the Cape Colony, the Transvaal Territory, the Orange Free State (which is independent), Natal, Zululand, and many other native territories. And anyone who will take the trouble to look at a map, and think a little of what he sees, may obtain a fair idea of the extent of this vast region; but, from no book, as far as we know, can any idea be derived of what South Africa really is from an engineering point of view. In times past, hampered and kept back as it was by forces at once momentous and vast, it had but little opportunity for developing its latent resources. For years native wars have been an insuperable enemy to progress, and were in themselves sufficient (to say nothing of the anti-progressive Dutch population) to keep back any country, no matter what powers of development it possessed; but with all these troubles, and they are greater and more deep-seated than anyone at home imagines, the Cape Colony has made great strides. Since the year 1874 several thousand miles of railways have been surveyed, and several hundreds constructed, opened, and satisfactorily worked; and this is but a mere drop in the ocean compared to what must be done, and for which this colony is fully ripe. And it came to maturity in this respect almost (when compared with other countries) before its time in consequence of one great physical defect. South Africa has no navigable river. From north to south or east to west, we can't find one that can float a boat of ten tons for twenty miles; therefore all transport is done (except where there are railways) on common roads [of the worst description] by bullock-waggons, and as the great centres of trade are far up in the interior, such as the Diamond Fields, the Transvaal, &c., the annual expenditure on carriage is enormous. There is, therefore, little originality in the suggestion to construct railways whereby goods can be carried at less than one-half the rate, and in one-ninth the time.

In 1874 the Cape Government got a Bill through the Colonial Parliament, authorising an expenditure of £5,000,000 on railways, and that sum, and a good deal more, has been spent on the lines now open and in the last Session of Parliament another Bill was introduced by the Government for exten-

sions, estimated to cost £7,000,000; but they afterwards withdrew it for some party reasons, and not that any man was against the Bill, for every member of the House wanted to have a railway at his own door.

We will now give a hurried sketch of one line, from which a general idea of all the railways in South Africa can be gathered.

The "Frontier Railway," commenced in the latter part of 1874, and completed in 1880, is one hundred and fifty-four miles long, running from East London, a rising seaport (where Sir John Coode is carrying out extensive harbour-works), on the Indian Ocean, to Queenstown, a pretty little up-country place, situated in a mountain basin at a height of 3,540ft. above the sea-level. The country lying between these points is rich and fertile; but a great portion of it, was, until after the Kaffir War of 1878, in the hands of the "Gioka" tribe, ruled by the famous "Sandilli." The country, without being actually mountainous, is extremely broken by hills, running parallel to the seaboard, and at right-angles to the line. The engineering problem consequently was, to run from hill to hill, with the least possible expense, and by the best line. And to do this, the engineer was allowed to use gradients of 1 in 40, and curves of five chains radii (66'); the latter of which, we are afraid, were taken advantage of far too liberally, for, standing on the top of a hill commanding a good view, the line can be seen for miles twisted and distorted like a huge snake basking in the sun; and to give the reader some idea of its tortuous nature, we may add that the total length of line, between its terminal points, is one-third more than the actual distance as the crow flies.

As before stated, the country is fertile; nay, more, it is in some districts extremely rich and beautiful, but for the most part ill-cared for and badly cultivated; and the patches that are tilled are pretty well left to themselves. Few of the farms are fenced, and the houses, taking the whole farming community of South Africa, are poor and comfortless. It is true the climate is good, and the people live much out of doors.

We must now return to the railways. All lines in the Cape Colony, with one small exception, are laid to the narrow gauge, 3ft. 6in., with steel and iron rails, 45lb. to the yard, the former only used on steep gradients and on outside of sharp curves; but we hope before long to see this false economy abolished, and the former metal universally adopted. Up to the present all sleepers have been imported from the Baltic, viâ England, where they were creosoted—or, to be more accurate, supposed to have been; but the Government are now taking steps to make use of the timber grown in the country, of which there is abundance in parts; but we have not yet had an opportunity of judging of its suitability for this purpose.

Up to the present all railways at the Cape—except one—have been constructed under what is called the "Departmental System," that is to say, the Government (in whose hands are all railways) established a "railway department," and appointed Mr. Charles Hutton Gregory, C.M.G., &c., of London, the chief consulting engineer, and he organised professional staffs for each line sanctioned by the Colonial parliament, and sent them out to survey and construct them, in all 959 miles, which are now practically completed—and out of this total length only about 190 miles were constructed by contractors.

This "Departmental System" has not been considered, on the whole, a success, either by the Government or the public, and, I am afraid we must add, by many of the engineers employed. Its failure was due to many causes. In the first instance, as soon as the Bill was passed, the country were impatient until operations were commenced. Consequently, the works began before the surveys were anything like completed, and the final result was that the navvy, with his pick and shovel, had to do much that the assistant engineer could have accomplished with his level and theodolite. Again, we acknowledge it with regret, many of the engineers employed having had no previous experience in the actual carrying out of works, gave prices to tradesmen and navvies—well, to say the least, that were absurd. Another cause of the unpopularity of the system, and perhaps the most serious, is that it gives scope for peculation of a serious nature; but whether it has ever been taken advantage of or not, we do not profess to know. On the other hand, much of the work done under the "Department" is sound and good, and many of the engineers employed were possessed of ability and experience; but, unfortunately, their results were leavened by those who had no such qualities.

For these and other reasons the Government have (we understand) determined to construct all future lines by contract; and we consider such a determination a wise one, for we are convinced that the legitimate duties of a civil engineer do not embrace all those that fall on a contractor's agent; and as an engineer under this "Departmental System" was so placed, his position was at once dual and utterly false. If the time that many professional men are forced to give to unnecessary reports and endless red-tapeism was thoughtfully devoted to their work, we should not have to hang our heads so often in shame for the blunders made and attributed to the profession all over the world; and, unfortunately, the mistakes of an engineer differ vastly from those of a lawyer or doctor. In one case a client may lose a suit or a patient may die, but in the other a work is executed which probably becomes a lasting monument of ignorance and incompetency, not only to its designer, but too often to the profession at large.

In a future article we hope to deal with South Africa as a field for young members of the profession.

R. H. H. H.

ROYAL ACADEMY LECTURES ON ARCHITECTURE.*

THE PRINCIPLES OF THE ART.

In my last lecture I endeavoured—and, I hope, not in vain—to show you what course you ought to take in pursuing the study of architecture as a fine art. I assumed that you were all students, whether of my own branch of art or of others, and that you would all, if you really aimed at success, gladly welcome my advice, even if at times I seemed to demand very much from you in the way of imagination, of zeal, of enthusiasm, and, more than all, of industry. To-night I advance a step further in an attempt to show you what are the principles of the art to which some of you are devoting yourselves, and in which all of you are interested.

Few, I suppose, can doubt that there are true and false principles in all the arts; but that they are more capable of definition in regard to architecture than to any of the others, is certain, and this because the absolute truth or falsehood of an architectural work is capable of demonstration up to a certain point. But by *principles* you must well understand that I do not mean *rules*. These last have often been laid down, with the result that where they have been obeyed implicitly, all life has been most effectually stamped out. Such, *e.g.*, is the supposed rule of proportion of columns and their entablatures in Greek and Roman temples. This was derived from the measurement of some one example, and the establishment of that as the model for all others, so that, given the diameter of your column, the rest followed, and, in short, the rule was not one for designing a good column, but one for copying exactly a particular column. There is no pretence for believing that such rules ever affected the original architects; and the particular features to which they are applied are so different in their proportions in ancient examples, as to prove that, even in the best days, there was great latitude allowed, and that there was none of the insipidity which is the certain consequence of obedience to such arbitrary rules. If you want to know how far the framers of such rules may try to take you, a few quotations from Scamozzi's "Mirror of Architecture" will suffice. "Here," he says, "is shown how the columns follow one another, and how high every one must be." "The Doric must be twelve modules and fifty-three minutes and a-half high." "The Ionic must be thirteen modules high." "The Tuscan arch must be three modules and fifty-two minutes wide." "The impost is twenty-seven minutes high," and so on, down to every detail of the column, its capital and base, pedestal and impost. Everything "must be" of an exact and defined height, projection, or distance apart.

The principles of the art of architecture are as eternal and reasonable as the so-called "rules" are arbitrary and ephemeral. It is with the former only that we are concerned to-night. The most indisputable are those which affect construction, and they are of universal application. The construction of a building must be good if it is to be a work deserving of our respect; and by goodness we understand that it must be (i.) permanent; (ii.) exhibited rather than concealed; (iii.) natural; (iv.) suitable to its purpose and material; and (v.) it must avail itself of the latest discoveries and inventions where it is clear that they are available under or consistently with the first four conditions.

A few words only will be necessary on each of these divisions. (i.) *Construction must be permanent.* In my last lecture I told you that our respect for old architects was generally in exact proportion to their respect for themselves and their work. No architect would willingly, I suppose, build a wall that was certain to fall; but he is hardly less to blame who knowingly builds one that is sure not to last very long; who makes it too thin, builds it without sufficient foundations, or uses a bad quality or insufficient quantity of mortar or cement. And as it is certain that purely temporary building is not architecture at all, so that is most likely to be architectural which is made to last as it were for ever. Now, to be permanent, a wall must be well constructed. It must not only have good and solid foundations, but its weights must be evenly adjusted and duly provided for, and its various openings must be, as far as possible, no cause of weakness to it. But, according to the second principle, that construction should be exhibited rather than concealed, the coverings of these openings ought to be evident and obviously strong enough for their place. A lintel is a good thing to use if you can be quite sure that it is strong enough not to break in two, but it is not a good thing if it really does no work, but is relieved of all weight by a hidden lintel of iron, or by an arch concealed in the wall above it. So, also, in good work, the construction of the exterior should, as far as possible, show the arrangement of the interior, and you ought at once to know something about the positions of the floors, the shape of the roofs, and the sizes and uses of the principal rooms, merely by examining the exterior of the building. The next principle that I have laid down is that the design must always be natural, that is, proper to the place, as simple as the case allows, and not strained or eccentric in its character or detail for the mere sake of producing effect. And on this point I cannot do better than by quoting what Leon Battista Alberti has well said (book i., chap. ix.):—

"We ought not to lay out our whole study in adorning one part of our building, so as to leave the rest neglected and homely in comparison of it; but let them bear that proportion among themselves that they may appear to be an entire and perfect body, and not disjointed and unfinished members. Moreover, in the forming of these members we ought to imitate the modesty of nature. Let the members, therefore, be modestly proportioned and necessary to your uses. For all building, if you consider it well, owes its birth to necessity, was nursed by convenience, and embellished by use. Pleasure was the last thing consulted in it, which is never truly obtained by things that are immoderate. Let your building, therefore, be such that it may not want any members which it has not, and that those which it has may not in any respect deserve to be condemned. Nor would I have an edifice terminated with even continued lines void of all manner of variety. Variety is, without dispute, a very great beauty in everything when it joins and brings things together in a regular manner,—things different but proportionable to each other. For, as in music, when the

* By George Edmund Street, R.A. No. 2, delivered Thursday, Feb. 17, 1881.

bass answers the treble and the tenor agrees with both, there arises from that variety of sounds a harmonising whole; so the like happens in everything else. Of course, things must be executed according to the approved practice of men of skill; but with this caution, that when famous architects seem by their practice to have determined this or that treatment of Doric, Ionic, Composite, or Tuscan, to be the most beautiful of any, yet they do not tie us down to follow them so closely as to transcribe their very designs; but only stir us up by their instructions to produce something of our own invention, and to endeavour to acquire equal or greater praise even than they did."

The natural treatment of the general design of a building is, therefore, that which you should always aim at, providing for the requirements of the building without any violent sacrifice for the sake of mere architectural effect. But such a principle as this has, of course, its limits. There is a sort of scenic effect which is not to be obtained so easily in any other way as by elaborately symmetrical arrangements of plan and building. Few finer examples of this can be pointed to than Greenwich Hospital, where—save for the blank absence of any central object to which the rest may lead up—the effect is unquestionably stately and impressive in a very high degree. Another example of the same class is Bernini's really grand quadrupled curved colonnade leading up with a vast sweep to the front of St. Peter's at Rome. Its scale is grand, and its extent magnificent; but it overwhelms the building to which it leads, and, grand as the idea is, the effect is not perfect, solely, as at Greenwich, because the central object is not in itself worthy of such a noble approach. In the late Genoese palaces you will find good illustrations of the same sort of scenic architecture, dependent for its effect on stately arcades leading from terrace to terrace, and in many of the French and English houses of the Renaissance there are somewhat similar arrangements. One wing corresponds with another. There is a central porch, and the garden is arranged in regular terraces, with pavilions or summer-houses at proper intervals. But if you compare one of the finer buildings of this class—as, for instance, Montacute House or Barrington Court—with the design of, say, Haddon Hall or Magdalene College, Oxford, where every portion of the building tells its own story, and is differently treated accordingly, it is impossible to deny that the love of stately balance and symmetry may be satisfied at too great a cost, and that a far better artist is generally revealed in the least formal work of the two. However much one may appreciate scenic architecture, it is necessary here to be rather discouraging as to its common introduction. For a long time the student has been taught that the only possible good arrangement of a large building is one founded on this principle. It has been assumed that all buildings must have a centre and wings corresponding exactly. If the stables are built in the guise of a wing connected with the mansion by a colonnade, then some use must be found, at all risks, for a corresponding colonnade and wing on the opposite side. So, a chapel and kitchen having to balance each other, neither can be allowed to tell its true story on its face, and, in the end, the scenic effect is the one thing that seems to be thought of. This is not convenient building, and is consequently not good art, and the cases in which it can be ventured on must always be rare and exceptional in their opportunities.

The next rule is that the design should be suitable for the material which has to be used. This is a practical rule which involves the wise adjustment of the means to the end. No architect should ever quarrel with his materials as long as he can insure their being the best of their kind. His sole busines is to take care that his design is suitable to the material, and usually to that which is nearest to his hand. Where means are unlimited, or the object to be attained is one of monumental character, then it is right to go far afield at any cost to obtain the best and most magnificent material; for the first step to be taken, if a building is to be sumptuous, is that the material should be worthy of the labour that is to be expended on it. And to some extent, the material that is to be used settles the design of the work. A quarry which produces enormous blocks of granite has scant justice done to it if the architect who uses it confines himself to small blocks of stone. It leads almost naturally to the use of great monoliths, than which nothing is more impressive, though there may be no art in the mere magnificence of size. Again, a design suitable for a stone country would be wholly unfit for one in which brick alone could be used; and wherever many marbles could be obtained, the design, to be natural, must be in every respect quite unlike anything that could be built in a country where nothing but a fine and easily-worked oolite existed, or in one where the only material was a hard and untractable limestone. Natural use of his material is, indeed, one of the first aims of a good architect, and this not only in the selection of the stone to begin with, but equally in the way in which it is worked. If you use a fine marble for the face of a wall, it must be wrought very finely everywhere, and polished for the best part of the work. If, on the other hand, you use a freestone, you may confine yourself to working the elaborated architectural features, only leaving the body of the wall rough; but you must remember that if your architecture is to be good or elaborate, you must begin by working the face of the wall, so that the whole may be of one harmonious texture. The size of the stones and their jointing is equally to be thought of. As a rule, large stones are only to be used in large buildings; for the apparent scale of a wall depends much on the size of the stones that are used in it. The same is true if the available materials are brick or timber. With either of these the whole structure, every moulding and every detail of ornament, ought to be different from what they are in stone. Every material has its own capabilities, and the architect is bound to use each in its proper fashion. And here, on this point of making the best possible use of common materials, I may give you a quotation from Sir Henry Wotton, in the conclusion of which I think we may all very heartily agree:—

"It will, perchance, be said that this doctrine" [which he had been laying down] "touching the five orders were fitter for the quarries of Asia, which yielded 127 columns 60ft. high to the Ephesian Temple, than for the Spirits of England, who must be contented with more ignoble materials. To this I answer that this need not discourage us, for I have often at Venice viewed with much pleasure an ante-porch after the Greek manner, raised by Andrea Palladio upon eight columns, the basis of stone without pedestal, the shafts of meer brick 1½ft. thick, and consequently 35ft. high, than which mine eye hath never seen more stately of stone or marble."

He then describes how the bricks were made, and concludes,—"which short description I could not omit, that thereby it may appear how in truth we want rather art than stuff to satisfy our greatest fancies."

Finally, the architect must avail himself of the best as well as of the latest discoveries and inventions in construction. It cannot be right to build one day with arches everywhere throughout his work, and on the next to assume that no such convenient servant as the arch had ever been discovered. Nor is it reasonable to say, "I will use a round arch because I like it, but though I know that a pointed arch is more convenient, and, in some positions, far stronger, I dislike it so much that nothing shall persuade me ever to adopt it,"—a sentiment expressed with the honest frankness of his time by the old writer just quoted, in the following passage:—

"As for those arches which our artisans call of the third and fourth point, I say these, both for the natural imbecility of the sharp angle itself, and likewise for their very uncomeliness, ought to be exiled from judicious eyes, and left to their first inventors, the Goths or Lumbards, amongst other reliques of that barbarous age."

The Pompeian architect who carried the entablature above his columns on a concealed log of timber was trying to imitate the work of men who had been dealing with blocks of stone large enough to bridge the space from column to column, and there was laudible ingenuity in the Pompeian's device, who, having no stone to use, invented a substitute for it. But to us who know that such a substitute is not permanent in its nature, and that there is now a mode of carrying the wall above by arches over such spaces which may be absolutely permanent, there is no justification whatever for the limitation of the Pompeian mode of building.

In modern buildings the greater part of the construction is concealed, and there is a consequent temptation,—only too often acquiesced in,—to make it subservient entirely to supposed convenience. A common instance of this is the free use of iron as a concealed support in place of masonry. Our forefathers knew nothing of such aids to easy planning. When they made the plan of one floor they involved themselves in accepting the same plan for the floors above and below. Walls came above walls, and no little skill was required, therefore, so to plan the various floors as to make all the arrangements convenient, and yet subject to good and sound structural conditions. In our own time the temptation to carry walls on iron girders over voids is too often accepted as a matter of course; the ingenuity exercised in planning is diminished, and the structure is less permanent, for a flaw in the iron, its decay, or the accident of a fire, may involve the ruin of a whole building where, under the old conditions, the walls might have stood unharmed by such catastrophes. I do not, therefore recognise such aids to construction as these as being real and genuine. They are rather temptations than anything else, and ought only to be adopted when it is clear that their use is not opposed to the principles already laid down. The architect who attempts by concealed construction to imitate a wholly different sort of work must inevitably fail, for sincerity is of the essence of good art, and the detection of insincerity is certain. Even untutored men will surely perceive that a deception has been practised, and will resent it. If you have such magnificent material that you can obtain it in masses of sufficient bulk, I can conceive no reason for objecting to the employment of trabeated systems of architecture. The vast bulk of the horizontal block or lintel is in itself impressive; and if it rests upon blocks of corresponding magnificence, in the shape of monolithic columns, there are few modes by which the imagination can be more surely excited. But the same sort of design executed with small stones, or with bricks covered with plaster, never impresses us in the same way, because the slightest attention discloses the fact that some unseen mode of holding the work together has been adopted, without which the whole must certainly at once collapse. The Mediæval architect was, like the Greek, a frank and sincere constructor. There was no disguise about his work. In his hands each stone may be said to have had its office and to have performed its duty. And there are few examples more illustrative of his feeling than those monuments and open porches which are so common a feature in Italian buildings. Here there are four arches carried on four single shafts,—a sort of construction which is really impossible. The architect frankly announces the fact that it is so by the exhibition of an iron tie across the base of the arch which ties the whole together, and makes the whole work, not only possible, but secure. The modern mode of doing the same thing would be to continue the columns up above the caps to support concealed girders. In this way the evidence of the tie is got rid of, and the eye is distracted by a feat of construction which, to those who are not in the secret, is wholly incomprehensible. In good work the external form is always a translation of the internal structure; a building, if it is perfect, being as complete an organism as the human frame.

So far, I think you will see that the principles which are necessary in all good architecture are almost beyond dispute. It may be said by some of you that they are mere truisms. Would that they were always so accepted and acted on! It is not too much to say that if they were absolutely accepted and always acted on little more would need to be taught. The man who never consented to break one of them would, depend upon it, have so much character as to make it certain that the ornaments of his construction, which convert building into architecture, would at least have that great force which comes from simplicity and fitness for their place and work. His ornament would be that of the construction, and would not be merely applied in front of it and without reference to it. His work would be so complete in itself and in its details that even as a ruin it would be beautiful. The ruins of the consummate works of the Greek architects are hardly less beautiful in their decay than they were in their perfection. Two thousand years of neglect have left the Temple of Neptune at Pæstum as grand and dignified, as well nigh as beautiful, as on the day of its completion, whilst the Gothic ruin is equally worth studying, and just as provocative of admiration as the Greek. Every part of its construction was useful as well as ornamental, and the destruction or decay of parts still leaves what remains instinct with power and beauty. How different may the case be! In a Roman building you may too often remove the whole *appliqué* face of the architecture, and the building will still stand, but in such a guise as to give you no sense of permanent beauty; whilst in a modern building it is sufficient to let it fall into decay to see how

loathsome it has been from the first, for that "calm decay" which seems to give so many added charms to the Greek or Gothic fragment, discloses in it nothing whatever that is good, or pleasant to the eye, or in any sense venerable.

We have next to consider how far, out of the vast array of facts which the student finds in the history of his art, some may be selected which involve the establishment of abstract truths. And to accomplish this we must examine the works of all times rather than of one period only, confident of this, that as all good developments in art have proceeded from the realisation of good principles dormant before, so the more these practices are traced home to the causes or theories out of which they rose, the more likely are we to perceive their true bearing.

The first essential of a building is, as we have seen, that it shall be well built. This is not architecture. Architecture is the art of giving "style" to building, and, after this, some or all of the other abstract qualities of Rhythm, Breadth, Scale, Light and Shade, Mystery, Repose. What, you may ask, is "Style"? I will answer you in the words of one of the most distinguished of my brethren (M. Viollet-le-Duc):—

"Style resides in distinction of form, and is one of the elements of beauty, though it does not itself constitute beauty. Our sense of style is instinctive. In the midst of an assembly you distinguish one man among all others. It is not beauty which attracts you in him, and yet, moved by a mysterious influence, your eyes follow him. If you have any power of observation, you find yourself arriving at some sort of explanation of the power he exercises. It is something in his frame, as well as in his contour, in his movements and the *rapport* which exists between them and his features and expressions. By degrees you have fixed ideas as to his habits, his tastes, his character. It is the first time you have ever seen him, and you know him not; but you build upon what you see a whole romance. It is only those who possess style who exercise this singular fascination. Mankind is so spoilt by false education, by infirmities, moral and physical, that it is not common to find any who really have this quality. But look at animals, and you will find that they all possess it. There is never a false gesture, never a movement which does not follow on a want, a desire, or a fear. Animals are never affected, mannered, vulgar. Whether plain or handsome, they have style, because they have none but simple sentiments, and seek their ends by the simplest and most direct means. Man, and above all, the most civilised man, being a very complicated animal, transformed by an education which teaches him to fight against his instincts, it is almost necessary for him to get out of himself, so to speak, in order to find 'style.'"

Style in architecture is the perfect harmony between the means and the end, which is found in all the ideas and desires of the highest type of man. Refinement of detail is indispensable; largeness and breadth are its natural forms of expression; but in certain places it may give greater grace to the most intricate and delicate work. It is this noble quality which is essential in good art, and it is as possible to have it in a building as in a man or a beast. The essential condition, you see, is that your style should be a true and sensible expression of simple and abstract principles or requirements. It has nothing whatever to do with styles of architecture, as we call them, for it is possible that every one of these in succession may afford examples of incontestable style. This, at least, is clear, I suppose, to all of you,—that a vast chasm exists between architectural designs; that some are vulgar, affected, mannered; whilst others are natural, simple, and dignified; and that whilst the only admiration ever extorted for the former is that ignorant love of a new thing which is so evanescent and so little to be respected, the admiration of the latter increases as they grow older, and year by year becomes more certain and universal. The popular voice, which finds something worth loving after an age has passed since the construction of a building, is as unerring in the correctness of its judgment as the supposed approval of a new work is fallible and to be mistrusted.

The next quality at which we must aim is, like the former, one which is common to our own and other arts. The poet cannot afford to neglect style in his work any more than he can venture to trifle with its rhythm, and a perfect building has its rhythm as well as its style. It is a quality very difficult to describe in words, but in architecture it is an art depending on numbers and proportions. Some expression caught up, repeated, balanced, emphasised in succeeding passages, at intervals which are either regular or regulated, constitutes usually the rhythmical beauty of a work of architecture. No doubt it is sometimes secured by direct appliances of geometrical figures, at others by that instinct for the beautiful which makes a trained eye go so near to the figures or proportions which might be drawn by rule, but to which the charm is added of something which is fresh, human, and suggestive in its very departure from exactness. Take the simplest case conceivable, that of a Greek portico. Arrange the columns with perfect regularity and without any thought, and there is no rhythm; but arrange them so that a dominant point in the base shall be placed in a certain relation to another, as, *e.g.*, the centre in one of the columns or capitals, or in the pediment, and that the line which connects these two points be one which, if repeated again, connects other marked features, and you at once have a simple and admirable sort of rhythm. Or, take another case, to prove the point by a negative. Design a tower, 300ft. in height, and divide it into twelve equal stages, and you will have an erection which will have no more rhythm than the empty sheet has before the poet has covered it with his rhythmical lines. Yet such a tower may possess all the qualities which I have up to this point included in the conditions precedent of a good piece of architecture. It may be solid, simple, suitable for its purpose, and may even have a certain style; but not having rhythm, it is not architecture at all in any good sense. If we wish to see how the opposite effect may be produced, let us see how Giotto planned the proportions of his tower or campanile at Florence. My drawing shows you this design in elevation. You will perceive that it is divided into seven principal stages in height. Of these the six lower are grouped in pairs, and so arranged by lines of dark marble and string-courses as to increase in height as they leave the ground. In the two lower stages, the panels, being very near the eye, are of the same height. In the next coupled stages the upper windows are one-seventh larger than those below them; the fifth and sixth stages are nearly equal, but the upper one has panels marked with an outline of serpentine one-tenth longer than those below. Finally, the single story of the upper stage is equal to two of those below, and crowns with rare grace this succession of coupled stages which have gradually led up to it. The diameter of the tower is the dimension which appears to regulate the whole scheme, being one-sixth of the whole height. The gables over the windows are of the angle whose base is as 3 to a perpendicular of 4 and hypothenuse of 5,—according to the ancients the perfect triangle, the square of the hypothenuse being equal to the united squares of the two sides. But the square or circle seems to have been the figure mainly used by Giotto in arranging the lines of his work. In Giotto's tower I have given you an example which shows, I think, how conscious one of the greatest artists was of the use of some definite system of proportion. It is not possible to give you an incidental treatise on so large a subject, in the midst of a lecture which has to embrace so much in so short a time. But in a few words I may direct your attention to it, with a view to inducing you to follow the subject up for yourselves as you have the opportunity. I will take one only out of many figures which have been made much of in old times, and this is the equilateral triangle. There can, I think, be but little doubt that the proportions of the Pyramids were decided by it. Take four equilateral triangles and incline them to each other to a common centre, and you have, as nearly as may be, the outline of the finest among them. The equilateral triangle has always been one of the most favourite forms, but especially was it so in the Middle Ages. Westminster Abbey and Stone Church are both designed with its aid, and M. Viollet-le-Duc has given several French examples—Notre Dame, Chalons, if I remember rightly, among others. Old writers frequently enlarge on the virtues of this and other such figures to the architect, and though in the use of many of them there seems to be something rather empirical, it is not possible to doubt that they have influenced architects in almost all ages.

(*To be continued.*)

ART-WORKMEN—PAST AND PRESENT.*

By John Roddis.

PROBABLY, no broader example could be given of that tendency to "think in crowds," described by Mill, than the popular favour shown to picture painting and the singular neglect of the industrial arts in England during the last hundred and fifty years. This tendency has been so marked, and its results have been of such a very decided character, that it would not be too much to say that for every score of Englishmen who could intelligently criticise the points of a good picture to-day, not more than one of the number could be found capable of judging the real merits of a good piece of enamelling, carving, gem-setting, metal-working, or any similar art. Every man of average ability is now expected to know something about "art," and following the prevailing fashion the crowds have looked at pictures, until a belief has obtained that this particular branch of art-work covers the whole ground. Now, if we look at this fairly, we shall find that it is a very remarkable thing, and wholly unlike anything which has preceded it. At the beginning of the eighteenth century the art-workmen of England stood in the very first rank. The true artistic instinct in the people had survived the long gloom of Puritanism. The French taste imported at the Restoration made no lasting impression. A little repose after the storm of civil war was all that was needed to prove that the arts of England were still alive, not only at the root but in every branch and fibre. If Esmond—with those calm thoughtful eyes Thackeray loved to dwell upon—had wished to show one of his old companions from the Low Countries the artistic skill of Englishmen, do you think he would have felt that everything worth seeing could be found in the studios of the painters? No! Esmond would have known, perhaps, where some excellent artist in iron was fashioning iron bars into fairy shapes, for the park-gates of "one Squire Western." And we may imagine Thackeray's hero whispering to his friend, "Western is a wild fellow, but, like most of our country gentlemen, he knows a bit of true art when he sees it." Then he would have carried him to the shop of some artist in silver; and, having looked in upon the furniture makers and jewellers, he might have asked his companion, with all modesty, whether English art, in its widest sense, was not fairly up with the age.

But a fresh change from this wholesome state of things was to follow—and it came about in this way. Hogarth was a personal friend of Captain Coram, founder of the Foundling Hospital, and the great painter's name consequently appeared in the list of its earliest governors. Hogarth then painted a portrait of the venerable Captain and presented it to the Institution, following up the gift with the "March to Finchley," and other works. Then came Richard Wilson, Allan Ramsay, and many others, with specimens of their art, until there was hardly a painter of note in the country who was not represented at "The Foundling." A visit to this collection of pictures became the fashionable morning lounge, and the grounds of the Hospital were daily promenaded by "ladies and gentlemen of quality," in all the pride of brocaded silk, three-corner hats, gold-headed sticks, and curly wigs. This enthusiasm suggested to the minds of the shrewd painters "a long-felt want," and, in order to meet that want, they decided to hold an annual exhibition of works by "the united artists," which, under the patronage of George III., became a Royal Academy of Arts. It was a strangely slender beginning, but the want they discovered has been so well met that to-day the capital of the Academy is more than half-a-million sterling. With the rise of the Royal Academy the decline of English art-workmanship set in. That institution has given such a vastly preponderating advantage to the producers of pictures over every other branch of art-workers, and its example has been so persistently followed by the provincial art societies, that all other arts have withered for lack of light and nourishment. For more than a hundred years Architecture suffered from this neglect, and its fortunes fell so low that it was driven to feed upon the dry bones of the "five orders." I need not remind you how strong men at length began to protest against the shameful state of their profession; and, though repelled time after time by the lofty superiority of the Academicians, the good fight was carried on bravely, until English architects had shown that they could build better edifices than many of their haughty rivals could even draw. Then the Academy, after long reflection, allowed that Architecture was an art, and elected a member of the profession to their body.

* A paper read before the Birmingham Architectural Association (see p. 189).

Having called your attention to these preliminary matters I will now proceed to examine the position art-workmen have held in former times; how they have worked, and under what conditions their various arts have flourished, commencing with some of those who assisted in the great revival of art in Italy. It appears to have been the rule at that time that a master should work with a few pupils under him—an average of half-a-dozen pupils, or workmen, to one master—and when the work was very large several masters were engaged upon it. To us who are familiar with "Art Companies, Limited," employing hundreds of workmen, under the direction of men who could not fashion a bit of gold, silver, glass, iron, or clay into any artistic shape whatever, this may at first sight seem very strange; but, as we look in upon the old artists in the midst of their work, we shall probably lean with a kindly preference towards their system of working. As an architectural sculptor, I shall, perhaps, be pardoned, if I first introduce to your notice one of my own profession. The name of Nicolo Pisano rises above all the bright names of the Revival like the morning star—he it was, who, finding the art of sculpture mummified, bound in Byzantine cerements, touched the dead thing with his miraculous fingers and gave it life. Little is known of earlier days beyond the fact he worked with his father as a stone-mason. The first time we are introduced to him as a sculptor he is working upon the scaffolds at Lucca Cathedral (1233), carving the pediment over the north portal,—a "Descent from the Cross," full of bold vigour in the composition, and full of error in its details no doubt, but still such a work as had not been cut in Italy for nearly a thousand years. Nearly thirty years after that (1260), he is carving the famous pulpit at Pisa in an entirely new style. He has been ranging up and down Italy during these years, working here and there, but mostly where he could find examples of antique art for study. It is my object to-ninht to describe not works but workmen, or a great deal could be said about the pulpit at Pisa. The fame of this work brought him a commission from the city of Sienna. The Siennese, emulous of the fortunate Pisans, would have a pulpit in their cathedral still more splendid. This is the work duplicated in plaster at South Kensington —the work that would have been duplicated for every great town in England years ago, only that gilt frames obscured the vision of those who should have done it. Pisano signed the contract for the Sienna pulpit on the 29th of September, 1266, and the bond states that "Nicola with his men, Arnolfo and Lapo, and, if he desires it, his son, Giovanni, shall come to Sienna in the beginning of March in the following year in order to prepare a pulpit for the Cathedral. The master is to receive eight soldi a day, each of his assistants six, and his son four. The master shall be allowed to travel four times every year to Pisa for fourteen days in order to superintend some works in the baptistery there. The columns, and lions upon which they rest, as well as the Carrara marble for the whole of the work, shall be furnished to him." The receipts for payment are still extant, and end in November, 1268, showing that the work was finished in a year and a half. And the four men must have worked like beavers to have done it in the time. The truth is the four, six, or eight soldi a day had very little to do with that speed. The men were in earnest, and gathered delight in their work just as the labouring bees gather honey in the roses. To them a dilatory day would have been a day of wretchedness. It is a curious fact, as showing what demand there was the services of Pisano, that we find him, in 1273, entering into a bond of £300 that he would carve an altar for the Cathedral, Pistoga. A few months later the work appears to have been in hand, as we find his receipt for £100 in part payment. Of the men he took with him to Sienna, Arnolfo rose to the greatest eminence, and in his turn made a distinct mark upon Italian art. Leaving his old master, he went to Naples and entered the service of King Charles of Anjou, and afterwards worked in Rome both as sculptor and architect, in which latter capacity he was intrusted with the restoration of the Cathedral at Florence and many other important works. It is pleasant to that his good master, Pisano, remained long to follow the art that seemed to be as life to him, for in 1288, nearly fifty years after we first saw him at Lucca, he, with his son Giovanni, is carving the great fountain in the market-place at Perugia; the son greatly improved, but without the fire and vigour of his father.

I regret that in the hour at our disposal I can do little more than glance at lives of the great art-workmen. I propose to bring under your notice this evening, and having briefly looked at the system under which the carvers were working at the end of the thirteenth century, I will now call your attention to the goldsmiths, and for this purpose, I think, we shall not do better than select Benvenuto Cellini. Cellini tells us that he considers himself to be one of the most wonderful men in the world, and he insists that there must be no mistake about that. He tells us also that he was born "precisely the night of All Saints' Day, in the year 1500, at half-an-hour past four," so that we are expected not to make any mistake about that matter either. His father, he informs us, was in great anxiety as to the sex of the child, and when told that it was a boy, he could do nothing in the fulness of his heart but clasp his hands and cry "He is welcome! he is welcome!" and Benvenuto being the Italian for welcome, it was decided to call the child Benvenuto, or Welcome Cellini. Well, he claims to be a wonderful man, and he was so. By turns he was gentle-hearted as a lamb, or cruel and furious as a wolf. He rode all the way from Paris to Florence to assist his sister's children when they were in distress; and at different times he killed no less than three men in private quarrels, besides maiming many others. One day he could reason with a prescience centuries in advance of his time, and the next become a prey to superstitions that would have disgraced the meanest intellect in Central Africa. He made for the Grand Duchess of Tuscany the most delicate gem ring that ever graced the hand of a lady; and for the Grand Duke he formed the gigantic bronze statue of Perseus. He partly fortified Florence, and acted as chief gunner in Rome during the siege, killing the Duke of Bourbon and wounding the Prince of Orange. Therefore, all things considered, I think you will agree with me that we may fairly laugh at his charming self-conceit, and still believe him when he tells us that he is really a wonderful man. It was necessary I should mention these singular contrarieties in his character, or, otherwise, we should hardly be able to account for the infinite variety in his works. These would require a separate lecture, or indeed a course of lectures, in themselves, and our object to-night is to look at the man in his "shop," as he was pleased to call the place he worked in. In his memoirs he says: "Having attained the age of fifteen, I engaged myself against my father's inclinations [his father wished him be a musician] with a goldsmith named Antonio de Sandro, who was commonly called Marcone. This was an excellent artist, and a very worthy man, high-spirited, and generous in every respect. So great was my inclination to improve, that in a few months I rivalled the most skilful journeyman in the business, and began to reap some fruits from my labours." But while yet a boy his fiery temper brought him into a violent brawl, and the Council of Eight banished him from Florence. After a time we find him working for the Bishop of Salamanca, who had employed him to make a large silver vase. Cellini tells us that his only assistant at that time was a little boy. This work led up to an introduction to the Pope and further commissions. And the young man, though now but twenty-three, was not content with fame as a goldsmith; he could not feel content with that alone, but would be master of all kindred arts too. He says: "There was at this time in Rome a native of Perugia, of great abilities, named Lantizio, the only man that worked in his branch of the business, which was that of a seal-engraver. Every cardinal in Rome has a seal upon which his title is engraved; it is made as large as the hand of a child ten years old, and the title is embellished with a number of figures. One of these seals well executed costs a hundred crowns and upwards. I could not help desiring to rival so eminent an artist, though this business differs widely from that of the jeweller and goldsmith. I therefore set about learning this business, and, though I found it extremely difficult, was never wearied by any labour it cost me, but steadily pursued the objects of gain and improvement. There was likewise in Rome another eminent artist, a native of Milan, who went by the name of Caradosso. This man worked only in medals, engraved with a chisel, upon thin plates of metal and many other materials; he made some Scripture pieces in mezzo-rilievo, and figures of Christ, a palm long, of thin plates of gold, and of such admirable workmanship, that I looked upon him as one of the greatest masters of this art I had ever known; and I envied him more than any of the rest." That admiration of the master, that grand spirit of emulation led Cellini later on to excel in this department of art also, and Pope Clement eventually made him chief medallist to the Roman Mint. When he was in his twenty-ninth year, he says he "opened a fine shop in the place called Banchi," in Rome. "I kept five able journeymen, and besides the Pope's business did several other jobs, insomuch, that the shop contained different wares in jewels, gold and silver to a very considerable amount." Now, it so happened, that thieves broke into this shop, from which circumstance we learn that the five assistants lived upon the premises with Cellini, who thus formed a little art community of his own. This appears to have been a very general system, and fifteen years later, when Cellini was employed at the French Court by Francis I., we find his leading men still domiciled with him. Indeed, he describes his domestic affairs in France at some length, and we may, perhaps, take so much from the description as serves to illustrate our theme. Writing of his assistants at that time, he says: "The first and highest in my favour was Ascanio, born in the kingdom of Naples at a place called Tagliacozzo; the second was Paolo, a Roman, a person of mean birth, who did not so much as know his own father; these two I had brought from Rome, where they had lived with me. The third was likewise a Roman, who came from Italy on purpose to enter into my service; his name also was Paolo, and he was the son of a poor Roman gentleman of the Maccherani family. This young man had made but little proficiency in the business, but he was brave, and an excellent swordsman. The fourth journeyman was a native of Ferrard, whose name was Bartolemeo Chioccia. The fifth was a Florentine, named Paolo Micceri." He is also good enough to give us a view of them all at work. The king having given Cellini an old castle for a workshop, resolved to pay him a visit, and we will let the master describe the circumstance in his own words. "As the king entered the saloon, the first object he perceived was myself with a large piece of plate in my hands, which I had not yet placed, and which was to make the body of Jupiter; another was employed on the head, another again upon the legs, so that the shop resounded with the beating of hammers. Whilst I was at work, as I had a little French boy in the shop, who had some way or other offended me, I gave him a kick which drove him above four cubits towards the door, so when the king entered the boy fell against him. The good monarch laughed heartily, but I was in the utmost confusion." It was shortly after this that Cellini made for the French king the famous salt-cellar, which is without doubt one of the finest examples of the goldsmith's art ever produced by any age or nation. This work was executed in fine embossed gold, enriched with a slight charging of enamel. Round the base are figures in relief representing the four winds and the hours of the day. The upper part represents the surface of the sea, and rising from it are figures of Neptune and Cytele; both figures inclining a little backward in order to form convenient handles. The sea god rests his hand upon the prow of a ship containing salt—a tribute from his kingdom; and the goddess in like manner rests her hand upon a vase containing spice—a tribute from the earth. This masterpiece of the art is at present in the Ambraser gallery at Vienna.

We will now turn our attention to another branch of metal-work, and in order to illustrate it, we will take up an art-workman much less romantic than Cellini, but certainly not less in earnest; I mean Peter Vischer, the great bronze-master of Nuremberg. Vischer came of a family of clever braziers. It is recorded that his father, Herman Vischer, in 1457 cast the bronze font for the parish-church at Wittenberg. But there is nothing very striking about the performance. People were running pretty much together in an old groove in Germany just then, so far as bronze work was concerned. The figures modelled by Herman were of a certain "regulation" type; but still they were equal in merit to any other production of the kind at that time. At length Peter entered his father's foundry, and taking his soul in with him, presently infused such life

into the art as spread their fame far and wide. In 1489 the young man was admitted as a "master" of his art, and in 1494 he was summoned with the carver, Simon Lamberger, to the court of the Elector Philip, then residing at Heidelberg, in order to "assist him with his advice and skill." Peter was a constant and enthusiastic worker, and later on in life it was his pride to see his five sons working in the foundry with him. Still happier was he on that day when his favourite son and namesake, Peter, was admitted to—What? To the Church? To the Bar? To the College of Surgeons?—those modern schools of hunger into which the sons of successful workers crowd so eagerly?—No. Peter had what was to him a greater satisfaction than all these, for he saw his worthy son admitted a "master" in the thimble trade. But then we must remember that he *was* a "master," not in the sense that he sat up in an office with his trade books around him, while in the factory below a thousand dies were stamping one everlasting pattern of thimble from year end to year end. The rims of his thimbles were adorned with charming figures and devices, and pretty legends in praise of industry. They were works of art, and therefore he was honoured with the dignity of mastership. In one sense Peter Vischer resembled Pisano, inasmuch as he grew stronger in his craft every day he lived. From the time he entered old Herman's foundry, as a boy, life with him was one steady succession of struggles, and one unbroken run of victories in his art, until he finally subdued the stubborn nature of bronze and gave to the world his famous shrine of St. Sibald. It is generally allowed that but one other production in this material can stand in the same high rank as this shrine, and that is the work of Ghiberti in his beautiful gates. There are duplicates of both at South Kensington, but the general public merely gaze upon them with a vacant eye, seeing little or nothing of their true beauty, for their minds have received no true art-education yet, and Uncle Toby looking into the widow's eye will serve their turn much better than anything Vischer or Ghiberti could do. There is just one other point I would like to mention about Vischer before I pass on, and that is his singularly unselfish method of business. His castings were acknowledged to be the very finest in Europe. He had no rival, and few came within reasonable distance of rivalship. Yet he was always ready to throw open his foundry and place all the masterly appliances he had invented at the service of others. I think you will agree with me that this was the action of a man who earnestly sought the advancement of his art before any other gain whatever.

I will now ask you to turn your attention to the enamellers, and with them we will carry our subject into England. Enamelling is one of the few arts we do not inherit from Greece, or any other ancient nation. In a crude manner it was practised in different parts of Europe soon after the fall of the Roman Empire. Perhaps one of the most striking examples of its use may be found in the well known crown of Charlemagne, the process used being that so well described by the monk Theophilus. But we have to do with the later schools, for it was an art that grew, and almost every century added something to its worth, until the gathered skill of the ages appears to have centred in the 16th century at Limoges. That generous patron of the arts Francis I., the friend, as we have seen, of Cellini, understood art-work too well to neglect any branch of it; and having seen specimens of work by Léonard, he at once decided to found a school of enamelling at Limoges, over which that excellent workman should act as director. But—and mark the delicate care of the good king—at that time Leonardo-da-Vinci, self-exiled from Italy, by sheer envy of his mighty rival Michael Angelo, was eating his great heart away at the court of the French King; so lest the proud and sensitive Italian should think his great name might be confused with that other Léonard, enameller of Limoges, Francis ordered that the latter should be known and spoken of as "Léonard Limousin," and by that name he is recognised in the annal of artwork-manship. Limousin, like his royal patron, was fully alive to the superiority of Italian drawing and colour, and under this influence improved his school until it was in advance of anything of the kind in Europe, or, so far as we know, in the world. His portraits too were held in great repute; notably those of the Duke de Guise, and Catherine de Medici—the latter is still preserved in the Cluny Museum. But it transpired later on that even Limousin, though he had then been working forty years, had not done all that could be done with enamel. In 1632 Jean Tontin, who was very skilful in treating translucid enamels, discovered a set of vitrifiable colours, colours that would stand the fire without any change of tints. It was now no longer needful, in order to produce shadows, to use the black enamel paste employed at Limoges, and Tontin rapidly took the lead in his art. He afterwards became famous as a miniature painter, and joining with Isaac Gribeling, a painter in crayons, took pupils, among others Morliere who afterwards enamelled rings and watches so beautifully that they became the fashion. But perhaps the brightest man of that school was Petitot, a native of Geneva, who, together with Bordier, went into Italy to study in the Italian schools and laboratories. In this partnership Petitot painted the figures and Bordier the hair, drapery and backgrounds. Their joint-work attracted great attention, and Charles I. invited them to England, where they remained many years. But troubles overcast the court of Charles, the civil war broke out, and after the death of their patron they returned to France, where Louis XIV. received them with great honour. Bordier died in 1690, and Petitot survived him but one year.

(To be continued.)

ROYAL INSTITUTE OF BRITISH ARCHITECTS.*

At the ninth ordinary (business) meeting of the Session, held on Monday, 28th February, Mr. J. Whichcord, F.S.A., President, in the chair, the President announced, with reference to the award of the Royal Gold Medal, that no substituted nomination had been sent in for the nomination made by the Council; and that, pursuant to the terms of By-law LXXVI., the vote of the Fellows present at the Special General Meeting, to be held Monday fortnight, would be taken by the show of hands on the name proposed by the Council.

A letter, addressed to the Secretary, was read from the Science and Art Department, London, S.W., transmitting, for the information of the Council, the copy of an English abstract of the principal regulations for the proposed Exhibition of Fine Arts at Madrid, which has been furnished to the Foreign office by the Spanish Minister.

All information which may be desired by intending exhibitors can be obtained at the office of the Spanish Legation, 12, Queen's-gate Place, S.W., between the hours of 2 and 4 p.m.

Mr. T. Roger Smith, Fellow, brought forward the question of the pressure of the existing Law of Light and Air upon architectural practitioners, and offered suggestions as to the rendering the law less oppressive; also as to the part which the Royal Institute of British Architects might take in forming public opinion, and promoting legislation on the subject.

Mr. Roger Smith concluded by moving the following resolution, which was seconded by Mr. E. C. Robins, namely:—"That the Council be requested to appoint a Committee of Members of the Institute to inquire into the question of the law of light and air, as it affects buildings, and to make such practical suggestions with respect thereto as may seem expedient."

A discussion followed, in which Prof. Kerr, Fellow; Messrs. C. Locock Webb, Q.C., Hon. Associate; T. Chatfeild Clarke, Fellow; H. Dawson, Fellow; Arthur Cates, Member of Council; E. S. Roscoe, Hon. Associate, and the President took part. The resolution was carried.

RENAISSANCE IN THE CITY.

Several new buildings in the Renaissance style are being erected or have recently been finished in the City. These works indicate a rather more English interpretation of a school of design which had begun to fall into disrepute some years ago, when every building of Classic architecture was more or less a copy of an Italian palace. In the new buildings we are referring to, there is a marked avoidance of commonplace columnar ordinances and details; thus in the new stone façade of the London and Lancashire Life Company's offices in Cornhill, still concealed by scaffolding, we perceive a little freshness in the treatment of the windows, which are divided by mullions; the carved entablatures and pilasters are subordinated, yet a strict Classical feeling pervades the composition. Messrs. Colls and Sons are the builders. In Lime-street, a block of new offices has been built, the fronts being of stone. The corner buildings we refer to are in a French Renaissance manner. Corinthian pilasters are introduced between the bays, but these are flatly treated, and the shafts are relieved by short flutings at the base, and below the capitals of pilasters. The carved heads of the second-floor windows, and the entablature and attic, are designed and executed in a quieter and more Classical spirit than we sometimes see. Adjoining is another row of offices or chambers in a style partaking of Venetian character, without columns or pilasters, but broad and flat in treatment and marked by some feeling. Below the windows the panels are carved with curvilinear ornament of flat character, the sunk part of the panel being only slight, but enough to give relief. This kind of enrichment cannot, at least, be charged with being commonplace; we almost tire of rows of balusters, and elaborate carved scrollwork in relief is worse, while a little change suggested by the architecture of the 16th century in Belgium or Germany may be welcome, although not pure in its origin. In the corner building of this row the windows are wide and have massive lintel heads supported by small pillars, and they are emphasised by corbelled balconettes, and various other features of Venetian character are introduced, such as the notched mouldings which surround the window-bays, and the semi-Gothic carving round the windows. In Fenchurch-avenue, two or three new structures of architectural pretensions have been built. We more particularly notice a stone-fronted block of offices, with pilasters of slight projection in three stories. The ground-story has wide rusticated piers, and these carry pilasters of much smaller diameter, while the upper row of pilasters carry nothing, but stop below a string-course in a meaningless and objectionable manner. Looking more carefully at the features of the building, there is evidence of refinement in detail, though some parts, like the pedimented doorway, show a strong Queen Anne temper, which rather spoils the otherwise quietly-treated façade. In each of the buildings we have mentioned, there is a distinctive character, and an avoidance of the commoner stereotyped and rather vulgar features of the style.

POTTERY DECORATION.*

A little technical guide-book on the decoration of pottery under the glaze, written by Miss Louise McLaughlin, Cincinnati, promises to become a popular introduction to an art now largely practised by amateurs. The authoress, from a lengthened experience, is enabled to give her readers some practical advice upon the subject of under-glaze painting. A preparation in drawing is one of the first requisites to success in the art, and as the authoress says, there is a foolish notion that anyone, however incompetent of drawing and ignorant of decorative laws, can paint upon pottery. The preliminary remarks in the little brochure before us are descriptive of the manufacture of pottery, the processes of drying and firing, &c. The difference between over and under-glaze painting is pointed out. We may quote a few passages here: "Over-glaze painting is executed upon the glazed surface of the finished ware with vitrifiable colours, having enough flux or fusible material in their composition to cause them to fuse at a comparatively low temperature, and so become attached to the glaze. Under-glaze decoration is effected by the use of colours which contain less flux, and consequently require a higher temperature for their fusion. It can be executed either upon the ware in the "green" state, or, as is more commonly the case, in the biscuit. These two methods of painting differ materially in their effects. . . . Those who are not practically conversant with the two methods can be easily

* Our reporter was not admitted at the last meeting of the Institute, and the printed proceedings from which this report is taken have only reached us on the day of going to press, and are, in themselves, incomplete—containing no report of the discussion.

* Pottery Decoration Under the Glaze. By M. Louise McLaughlin. Cincinnati: Robert Clarke and Co.

misled, and mistakes are frequently made by those who should know better as to the method employed in the case of a piece of ware in question. A certain delicacy of tint and firmness of outline characterises over-glaze painting, which is easily recognised by experts; but those who cannot distinguish between the two methods by this means, may ascertain to which class the decoration belongs by looking aslant the surface." Under-glaze decoration is more uniform on the surface than the other kind; the painting itself is more difficult, the colours being more likely to change under the great heat required. The difficulty of knowing the resulting effect can only be overcome by repeated failures, and it is this experience which the book before us is intended to supply in some measure. It is admitted that over-glaze painting possesses greater delicacy of effect and a variety of colour, though the under-glaze is the most artistic and effective, and seems to be the most rational method of applying the decoration.

The colours for painting under the glaze are prepared from metallic oxides, and are fewer in number than those employed in the other method, being confined to colours which will stand a high degree of heat. These are named, as well as the fluxes used; and the author speaks well of the finely-ground French colours manufactured by M. Lacroix. A list of the best of these which have fired well are given, and will be of service. The English carmines are said to be very satisfactory, and the Victoria green of the Worcester colours is specially commended, as a light green which stands well. Phillips's English colours are also well spoken of, especially his Mazarine blue.

The method of decoration described is said to be similar in its effects to the Haviland or Limoges faience, and the chief feature of the process, according to the writer, consists, not in the glaze, but in use of clay, which is mixed with colouring oxides capable of bearing a high degree of heat and which gives body, producing an impasto in the painting. The operation has the nature of both painting and modelling as "the high lights may be laid on so thickly as to produce actual relief." The entire secret of the method consists in the use of clays as a vehicle or body for the colours, a mixture of those partaking of the qualities of both yellow and red clays being considered the best. This clay is dissolved in water, and should be made a little thicker than the diluted clay called "slip." Ware in a "green" state, moist from the moulder, is recommended, and a heavy impasto treatment produces the richest effect. To prevent the applied clay from cracking in drying, care is necessary to lay on different layers of the same consistency, or to have the body of clay moist. We have no space to follow the writer in the directions given for painting a vase, which will be found clear and sufficient, the chief aim of the painter being directed to obtain a good even ground of two coats, so as to cover the ware, and to lay on the decorative design, beginning with the middle tint next the shadows, and lastly, laying on the high lights so as to give relief. Some remarks on "drying," modelling in relief, incising and carving follow, and the handbook will be found a valuable help to those who are desirous of mastering the difficulties in the way of this pleasing artistic handicraft.

THE VENTILATION OF DWELLING-HOUSES.*

ANOTHER edition of this treatise has been brought out, and the author of it, Mr. Frederick Edwards, jun., known as the author of "Our Domestic Fireplace," and other works on kindred subjects, while deprecating the slow and tardy recognition he has received from a section of the public press, enters afresh into the discussion, and passes in review the systems of ventilation and warming which have been recently brought forward. On the publication of the first edition we expressed our opinion on the merits of Mr. Edwards' treatise, and, therefore, we may confine ourselves in the present notice to a brief allusion to the principal suggestions the author has now to offer. Since the appearance of the author's first edition, the subject of ventilation and warming has become a pet one with sanitarians, and the literature of it has largely increased.

Mr. Edwards's book is essentially a practical guide, and the author is content with describing and commenting on the merits and shortcomings of the numerous theories and patents rather than propound a new theory of his own. And it is really this view of the question that commends itself to the practical man, for it must be acknowledged that since Drs. Reid and Arnott we are in possession of all that is valuable in the theory of the subject, the chief question being the best mode of applying our knowledge to existing circumstances. Mr. Edwards's improvements are based largely upon the sound principles which Dr. Reid and Dr. Arnott were the first to introduce into this country, namely, the control of the draught in the chimney flue; he further recommends a supply of fresh air from an external source to every fireplace, so that we may not depend on a mere chance supply by doors and windows. In his preface, he says, "In most modern grates, the principle of slow combustion, which he has been recommending for twenty-five years past, has been introduced in some form or other. . . . The principle of heating a large number of houses from a single powerful furnace, which the author discussed in the previous edition of this book, has not been introduced in this country, but has been introduced in America." The author further alludes to the unnecessary discharge of air through our chimneys, in some cases amounting to as much as from 20 to 60 thousand cubic feet of air per hour. This air is drawn from a variety of sources, through doors and windows, from the basement; it descends unused and short chimneys, comes up escape-pipes, and even drains and sewers. These evils, he contends, may be effectually dealt with by amendments to the Building Acts, which shall require properly-constructed register doors to check draught, and a compulsory admission of fresh air, from an external source, in connection with every fireplace. By these two improvements the following advantages are secured:—"(1) Economy in fuel; (2) An absence of draughts; (3) Absence of closeness; (4) Absence of smoky chimneys; (5) No rush of air from the basement, with smell of cooking, &c.; (6) Attic floors and small rooms, with short chimneys, easily warmed, and perfectly habitable; (7) The chance of the entrance of foul air by escape-pipes reduced to a minimum." No one can question the soundness of these principles, which the author thinks should receive the attention of the Legislature, and not be left to individual caprice.

In the second chapter of the work, the author describes a variety of appliances for ventilating dwelling-houses; these are divided broadly into those which provide for the entrance and those which provide for the exit of air, but the principal of these are too well known to the architect to require repetition. Perforated zinc, air bricks, sliding valves, louvre ventilators, and the kinds known as Sheringham's, T. Boyle's, Cooke's, and other forms of window-sash and door ventilators, are illustrated. Many of these are simple and self-evident forms of inlet, others like the "sun burner" system of ventilating, are revivals of old plans. Mr. Edwards combats the notion that a high-level admission of fresh air is more liable to contamination before it is inhaled than when introduced below; as regards the contrivances for admitting air, those which distribute the air are undoubtedly the best; and the author names Lockhead's, Cooke's, Boyle's Blake's, &c., as preferable to many others. Speaking of ventilators, he says, "If a ventilator to admit air in moderate quantity be provided to every window, if an open fireplace be used, and the chimney be otherwise turned to account, and if gas be only used along with effective means for removing the products of combustion, there can hardly be reasonable grounds for supposing that the chambers of our dwellings will not be as well ventilated as existing circumstances will readily permit." The author's remarks on the ventilation of basements, kitchens, ground-floors, bedrooms, and other parts of a house, are useful, though the suggestions contain little which the architect who has any knowledge of the principles of ventilation, would not readily agree with. The use of Sheringham's or some other kind of inlet to afford a supply of air to the fireplaces, without allowing them to draw on other questionable apertures, is too self-evident to require notice, and the same may be said of the value of checking or regulating the air up some chimneys by the use of registers, so as to prevent down-smoke in others. For bedrooms we think the air is better admitted through an inner wall than direct through an outer wall, as between the upper and lower sashes; and gas-burners ought to have some provision like the ventilating-lamp, for carrying off the products of combustion.

We pass to the second part of the book, which treats on warming, and in this division of the work we find the author more at home. The various schemes for getting rid of smoke are discussed, and many sensible remarks are made upon them, into which we have no space to enter. The author shows very obviously how we may burn bituminous coal in our open fireplaces with little smoke, and the principle he adopts is simply a modification of the well-known plan of Dr. Arnott. Everyone will admit the sunk ash-pit was objectionable, and the contrivance complicated, though all will acknowledge the soundness of the principle. Mr. Edwards's grate retains the best features of this grate, and is illustrated. A sort of blind or shutter to move up and down in front of the burning coal is substituted, the ash-pit is dispensed with, and a neat front is the result. The author enters into the question of fireplaces and smoky chimneys pretty fully, and quotes Captain Galton's figures bearing upon the rate air passes through the chimney, which give 4 to 6 cubic feet per second, or 14 to 20,000 feet per hour as passing up an average chimney with a fire burning.

Mr. Edwards does not claim to have done more than point out the grievances of the smoke nuisance under which we suffer, and the wasteful expenditure of our fuel. He shows that our chimneys discharge an enormous quantity of air, drawing their supplies from the worst sources, and that the remedy for this, applicable to existing houses, is, first, to check this enormous passage of air through our flues by a "regulating register," which may be closed more or less by means of a handle in the room under complete control. A diagram of this regulator is shown, and its advantage is, that it can be operated without blacking the hands. Secondly, a systematic introduction of fresh air, without draught, is necessary, to accomplish which the author proposes the air to enter warm, near the fireplace, in winter, instead of traversing our rooms. The plans indicated show openings over the grate, or a ventilating grating at the top, with a warm-air chamber behind the fire. Preferably he "adopts the system of admitting fresh warm air by carrying a smoke-flue from the grate to the ceiling with a warm-air channel around it, and to allow a second supply of fresh warm air to enter the room below the ceiling, through an open grating." This utilisation of waste heat is alleged to be a distinct improvement on Captain Galton's system. We cannot follow the author further, though the remarks on utilisation of waste heat are in the main true, and may be accepted as a fairly representative statement of the question; and, on the whole, Mr. Edwards' work may be read with profit by members of the profession, and those interested in the great question of the economy of our heating arrangements.

NEW BOARD SCHOOLS NEAR HARROW-ROAD.

LAST Saturday afternoon the Architectural Association paid a visit to the new Board Schools situated in Beethoven-street, on the Queen's Park Estate, Harrow-road. These schools have recently been erected from the designs, and under the supervision of, Mr. E. R. Robson, F.S.A., architect to the London School Board, the contract having been taken by Mr. W. Downs, builder, of Walworth-road. The design is based on what has been called the "central hall principle," and the buildings occupy a square area of some extent—a plan which, while it allows of many advantages in one-storied buildings, admits of adoption only where a large area of land can be obtained.

The ground-plan resembles in shape the letter I the hall forming the central block, the class-rooms being ranged on each side parallel thereto, and also occupying the principal front and back blocks. One-half of these are for girls and the other for boys, each side having two entrances placed in the angles. Four class-rooms (each

*The Ventilation of Dwelling Houses, and the Utilisation of Heat from Open Fireplaces, &c. Second edition, revised. By Frederick Edwards, jun. London: Longmans, Green, and Co.

29ft. × 20ft.) are thus arranged *en suite* at each end of the hall, and these form the principal blocks front and back. The class-rooms are separated by wooden partitions with sliding partitions. Entering by one of the four corner entrances, there is a plain tiled lobby with iron scraper, a cloak-room fitted with racks for hanging on one side and with ample means of ventilation, also a lavatory; we next come to the graded schoolrooms, floored with wooden blocks laid herring-bone fashion, and having a raised stepped platform for desks. These rooms are commodious, well ventilated by ceiling outlets with flaps, and lighted by large windows with the usual School Board window-sashes below, and with casements above a transom, the latter opening inwards by means of Elsley's patent

We next enter the hall, which is 65ft. long by 30ft. wide, lighted chiefly from an upper raised longitudinal skylight. The roof of the hall is constructed in one wide span, which includes the class-rooms on either side, the main rafters being continued over the side-walls of hall, and the whole forming one wide slated roof on the outside, relieved only by the centre skylight of hall. An economical construction is obtained by this plan. The principals to the hall are plain fir, stained and varnished, and tied together by iron tie-rods. The lateral class-rooms open into the hall by wide revolving shutters, fitted with an adjusting screw by G. Stevens, of Goswell-road. Boyd's stoves are provided for heating; there is a gallery at one end, and the floor is laid with wooden blocks. The walls are painted and coloured above a high dado, which is of a reddish chocolate colour. Deal desks made by Mr. Lascelles are fitted in the school and class-rooms.

The infants' school forms a separate building on the girls' side of the site. It is a plain brick building of parallelogrammic form, divided by a longitudinal wall. On one side are school-rooms, each 38ft. by 24ft., with a class-room between and a "Kindergarten" gallery is fitted up in each; between the school-rooms are sliding partitions by which the three rooms may be opened as one for assemblies. On the other side are babies' rooms and cloak-room between; the former have galleries at the corners, and are well lighted and ventilated. Isolated closets are built at each end. There is also a small lodge for a caretaker, near the entrance to the school-ground. The external features are plainly but effectively treated, malms being used for the outside walls, relieved by quoins, window-dressings and string-courses of red brickwork neatly pointed, the characteristic style of the Board School having been followed. We understand Mr. Robson has adopted a separate system of drainage, the rain-water and sewerage being kept quite distinct.

ON A COMMON BUT VITAL ERROR IN THE CONSTRUCTION OF SKEWED ARCHES.*

By Edward Sang.

IN the arrangement of a railroad we must often cross other routes or streams obliquely; thus skewed arches become a necessity to us. The construction of a skewed arch, however, involves a considerable knowledge of solid geometry. Now, in our school estimate, he is a great geometer who has mastered Euclid's first three books; he who knows the sixth is a prodigy. Yet Euclid's six books form but the first chapter of geometry proper; they are only the skimmings of the surface. Hence the average engineer shrinks from attacking the problems connected with the skew; struggles through them with doubts, leading sometimes to disaster; or, in despair, has recourse to the trussed girder.

Not those of geometry merely, the laws also of statics have to be considered; these laws, bearing as they do upon our every-day life, are ignored among our pedagogues. It is more praiseworthy to know the name of the centurion who first crossed the Rubicon, than it is to understand the action of a pair of common scissors. Hence the grossness of our ignorance of common things. We have had, in reference to the arch-stones of a skew, discussion after discussion in which the law of stability is never once adverted to. Hence, besides seeing the skew sometimes placed unsuitably to the roadways, we invariably see the courses so contrived as to offend even the commonest perception of the proprieties of building.

In building a house on a hill-slope we do not lay the foundation-stones flat on the ground and pile the courses parallelly upon them. An ordinary navvy knows how to dig the found level, and the youngest mason's apprentice knows how to try the plummet on it. It is an easily-perceived and well-known law of structure that the resisting surface should be squared to the direction of the pressure applied to it. If the surface be placed obliquely, we know that there must be a tendency to slide, which tendency can only be resisted by the roughness of the surface or by the stickiness of the mortar; and we know also that, if the obliquity be too great, both of these may fail to prevent the sliding. Hence the maxim that in a properly-arranged structure each resisting surface or bed should lie square to the pressure applied upon it.

Now, in every arch, whether oblique or not, the pressures must be from one abutment to the other: hence their directions must be in vertical planes parallel to the length of the road; while they must be inclined according to the curvature of the arch.

At the crown of a skewed arch, then, where the direction of the thrust is horizontal, the course of the arch-stone must be square to the line of road, and consequently oblique to the crown line. Now, if we place an arch-stone so on the crown line of the centring, its ends must descend either way on the sides: as we descend the inclination of the line of pressure changes, and the question presents itself, How are we to shape the course, so that at all places it may cross the line of pressure perpendicularly?

The architect, or, as he prefers to call himself, the engineer of the bridge, settles the matter at once; he makes the courses of one breadth all along like the thread of a common screw, and he perseveres in this arrangement to the very abutment; he has made no inquiry as to whether the conditions of stability be thus satisfied.

The merest glance at the result of this procedure is enough to show that everywhere, except at the crown line, the bed or resisting surface is oblique to the pressure upon it; and, as you see from the example before you, the obliquity increases as we descend upon the arch; and it must necessarily be so. The mark of each stone upon the sofit is a quadrangle, none of whose corners is right.

The actual building of the arch is begun at the abutment, and the very first operation, that of preparing the abutment to receive the first voussoir, tells us that we are wrong, for we are dressing the bed obliquely, not to the plummet, for with that we have at present no concern; but to the line of pressure, as indicated on the centring. Our very drawings tell us this. The engineer, however, complacently lays the stone down, and proceeds to build upon it in the same faulty way. He does not perceive that he is building a house on the hill-side, with the foundation and courses parallel to the ground. The placing of the crown-stones square to the road was a faint admission of the true principle, to be disregarded everywhere else.

It is not to be wondered at that structures so put together and subjected to the tremor of passing trains, should come into disfavour. Were it not for the cohesion of the mortar and its gradual hardening by carbonisation, skewed bridges built in this way would inevitably tumble.

Beginning from the crown, let us trace what ought to be the course of one of the beds. Setting out square to the line of road, and descending upon the curved surface, it crosses one of the lines of pressure, one of the sections of the arch by a vertical plane parallel to the roadway; it should cross this line of pressure perpendicularly; and this condition serves to determine its form. It is thereby required that the thickness of a course should decrease as we go down, being in all cases proportional to the cosine of the inclination; thus, in the case of a circular arch, the thickness of the course at 60° from the crown should only be half of what it was there.

From this definite geometrical law, which indeed is the translation of the mechanical one, we are able, whether the arch be circular or elliptical, or of any other form, to compute the details of the structure so arranged that the resisting surface shall everywhere be square to the direction of the pressure. In this way, since there is no tendency to slide, the whole strength of the cement goes to augment the stability of the structure.

There does not appear to be anything very difficult or incomprehensible in this law; nothing, surely, beyond the capabilities of those who claim to write "Civil Engineer" after their names; and yet it does so happen that not a single skewed arch, so far as I have learned, has been built in Britain embodying this easy but indispensable principle.

Ah! but, we shall be told, this is a new principle never before heard of. Who is to be blamed for not having put in practice what was unknown? Softly a little. I ask you to turn to the first volume of the *Transactions* of our Society, or to the *Civil Engineer and Architect's Journal* for July, 1840, and there you will learn that the whole of this doctrine was fully explained and published six-and-forty years ago. That is a long while for a true principle not to make its way, but to make no way among those who are the most deeply interested in knowing and applying it.

The other side of the centring before you exhibits the proper arrangement; which, besides that of giving all the stability attainable, has other and important advantages. Firstly, it recognises no limit to the angle of skew. Secondly, all the arch stones, except those at the ends of the courses, are approximately rectangular. Thirdly, the variety in their thicknesses makes the contract with the quarry-master much more easy.

Unfortunately, this law is expressed in the form of what is called a *differential*, which has to be *integrated* to be made of use; while the differential and integral calculus is but rarely glanced at by our engineers. Yet this calculus, the calculus of infinitesimals, is so elementary in its nature and so all-pervading in its uses that, without a knowledge of its essential principles, no one can understand how to measure the surface of a sphere, how to tell the circumference of a circle, or even how to compute the solidity of a pyramid.

* Read before the Royal Scottish Society of Arts, 28th February, 1881.

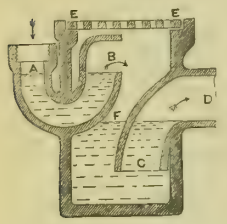
THE FRATERY, CARLISLE CATHEDRAL.

THE refectory of the Austin Canons at Carlisle, now known as the Cathedral Fratery, is the subject of an article in the *Saturday Review*, in which Mr. G. E. Street's work of restoration, now being completed, is defended against the charges made by the anti-restorationists. The Fratery is erected parallel to the church, on the southern side of the now-destroyed cloister-court; it is of Decorated character, but the large traceried windows on the south side, and the alterations about 1484, have given it the appearance of a 15th-century building. It stands on a vaulted undercroft of six bays, and measures 79ft. by 27ft. Patched up and Italianised by Machell, the clerical reviver of Classical architecture in the diocese of Carlisle, the hall had been divided into three apartments, new floors and ceilings had been introduced, and every early feature had been mutilated or destroyed. Mr. Street has thrown down the partition walls and opened out the whole apartment, with the exception of the eastern slype, and it is to be converted into a muniment room. The jamb and base of the original doorway, c. 1300, which had been replaced by Prior Gondibourne by another, which in its turn had perished, have been discovered by Mr. Street, and are being rebuilt on the old lines, exactly reproducing the beautiful mouldings. This door will be approached by a short flight of steps, and protected by the restoration of one or more bays of the destroyed cloister, of which the foundations have been dug up. The plaster ceiling and modern roof of the hall have been replaced by a semi-hexagonal coved ceiling, with tie-beams and king-posts. Machell's square-headed windows, with central mullion and transom of the familiar Cambridge type, which were being crushed by the decay of the wide oak lintels, have been removed. Some 14th-century niches, which had been used by Machell to block up the small 14th-century windows above the cloister-roof, have been placed in their original position above the high table. The external walls, of soft red sandstone, have been carefully restored, the string-courses being renewed wherever traceable; and the beautiful reading-pulpit on the south side, with its exquisite panelled ceiling, seat and water-drain for the reader, has received attentive treatment. When the restoration is finished, Carlisle Fratery will, accord-

ing to the writer in the *Saturday*, exhibit the most perfect example of a Mediæval monastic refectory to be seen in England.

A NEW DISCONNECTING TRAP.

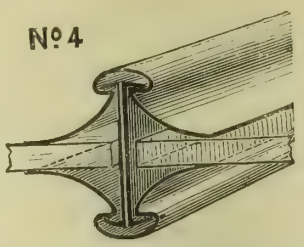
Messrs. Jas. Stiff and Sons, of Lambeth, are manufacturing a newly-invented waste-water trap, called the "Weatherly Disconnector Trap," which combines in a convenient and easily-accessible form a siphon trap, a waste-pipe, a grease trap, and an open yard gully, which we have pleasure in laying before our readers. It can be placed in any convenient position outside the house, wherever a waste-pipe discharges. The trap may be best described by the accompanying section. A B is a siphon or inlet into the outer end of which A, the waste-pipe, is introduced. It has a deep water-seal, and the discharge end, B, is so turned into the gully that no dirt can clog the siphon, nor can the slop-water be forced up through the grating E E. The end B is also made large enough to admit the hand, so as to remove an obstruction, should any occur. The exit pipe, C D, by its dipping into the gully, becomes a second trap, affording a good water-seal, and any gas from the sewer end D, which may pass through the lower trap, finds an easy and constant escape through the open grating into the air, so that double security against effluvium is obtained by this means. Grease finding its way into the trap will float on the surface of water, F, and can be removed by taking off the iron grating. It will be seen that the Weatherly trap is simple and effective in operation; it contains nothing likely to get out of order; there is no chance of its overflowing; the double trap and open grating are both safeguards against the admission of any sewer air into the house, and as the traps are distinct and independent, the foul gas can exert no pressure on the inner and upper siphon. As we have personally inspected the trap, we can safely recommend it to the profession as an economical substitute for other costly and elaborate contrivances designed to effect the same object. The whole trap measures, internally, 10in. by 9in., and 16in. in depth. The inlet, A, is 2in. diameter, B is 3¼in., and D is 4½in. diameter. There is nothing to corrode, as the entire trap is manufactured of glazed earthenware, and its price, complete, with iron grid, is only 12s. 6d.



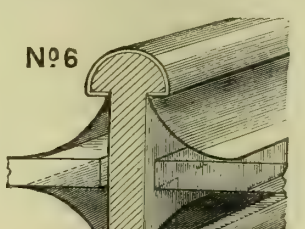
The "Weatherly trap" does in a simple manner what dozens of elaborate "interceptors" do in a more complex way: it breaks off the connection between the waste-pipes from our sinks, lavatories, and baths, and the sewer, and carries out a principle that has been universally accepted by all scientific sanitarians. We have lately spoken of the absolute importance of applying such principles in the most direct and least costly manner, if architects are to benefit by appliances, and the Weatherly trap seems to be a timely introduction. It can be simply set in the ground as a box, and the connections made, and does not require brickwork. We may add that the trap has been lately commended by Professor Corfield, M.D., at the Parkes Museum of Hygiene.

FLETCHER'S PATENT METAL SUBSTITUTE FOR PUTTY.

We have this week examined a new mode of glazing horticultural and other buildings, the principal object of which is to give a secure fixing for the glass without putty. One objection made to some systems is that the zinc bars do not fit closely to the glass throughout its whole length; the rebates or clips which take the glass are usually made rigid, and as they grip or hold the glass at only a few places where they happen to touch the uneven surface of the glass, they are liable to crack and split it, besides letting water through. In Mr. Fletcher's patent "Metal Substitute for Putty," the zinc or copper bars are so formed as to hold the glass in a less rigid manner; instead of the metal being bent at right angles to the glass, holding it as in a vice at a few points, the surfaces of metal and glass are in close contact along the edge, the former bending and adjusting itself to the inequalities of the glass, so that a firmer hold, added to a more water-tight joint, is the result. By the aid of the accompanying sections these features and the principle of the bar can be readily comprehended. No 4 shows a light zinc



or copper bar formed by uniting a top and bottom "putty substitute," making a neatly-finished moulded rib for general roofing. The chief feature, as before hinted, is the form of the metal and its relative position with the surface of the glass. Mr. Fletcher's bar, it will be seen, instead of holding the glass in a few points tightly by making the metal grip the glass at right angles, curves the metal so that its surface presses uniformly upon that of the glass, and follows any inequalities in it from end to end, thus avoiding the objections of partial grip or looseness and vibration of the glass, Another advantage claimed for Mr. Fletcher's system is that should "any moisture from condensation or otherwise become frozen between the metal and glass, the force of the expansion of the water in freezing will lift the metal rather than break the glass, so that when the ice thaws the metal will resume its position upon the surface of the glass." No. 6 shows a



section with a galvanised iron core combining increased strength and rigidity with the "substitute" and admirably adapted for large roofs. The "metal substitute" can be adapted to any form of glazing bar in wood or metal, and it has undoubted advantages for skylights which are so exposed to the sun that the usual putty joint quickly becomes brittle or rotten. For skylights the "substitute" would be used on the top only in place of the putty. Mr. Fletcher indeed does not claim as his invention a new metal bar, but rather a method of applying metal as a fixing for sheets of glass to ordinary bars. As the metals used are not corrosive, no painting is required, while the ease and facility with which the glass can be introduced enables Messrs. Fletcher, Lowndes and Co., of Westminster, to undertake contracts at a considerably less rate than those for roofs glazed upon the ordinary systems. The "substitute" can also claim to be a little less unsightly than the putty joint, and being of a moulded form will commend itself to architects as a neat form of bar for glazed roofing.

TOTLEY TERRA-COTTA.

A new company is being formed to develop and carry on the terra-cotta, fire-brick, pipe, and tile works at Totley, near Sheffield, hitherto conducted by the firm of Chadwick, Barker and Co., and, from an inspection of the terra-cotta manufactured, we believe with a fair prospect of success. The specimens of paving-tiles we have examined in white, red, and other colours are hard and true in shape, and of a quality leaving little to be desired. Stable bricks and gutters, copings and curbs, ridge tiles, ornamental tiles, crestings, chimney-tops, &c., are among the more useful class of wares made besides sanitary goods; but we find the company intend to develop the architectural branch of their business in the manufacture of features and details. Trusses, capitals, mouldings, ornamental panels, balustrades, form a large class of the articles manufactured, and from our examination of some of the modelled work, we have little hesitation in saying the clays procurable are capable of being modelled into every useful variety of architectural or modelled ornament. Mr. F. Barker, member of the late firm, and formerly a Liverpool contractor, takes the position of managing director, and Mr. E. Griffiths, of 44, Finsbury-circus, is also on the directorate.

BUILDING NEWS DESIGNING CLUB—A VILLAGE INN AND SHOPS.

We have received for this subject a large number of creditable designs, some in a 16th century half-timbered style, and many of Jacobean character. The chief fault we find is the extravagant pretensions of some of them, and the large corner inn with rooms that would suffice for the wants of many a suburb to an important town. (1) "Veronese" has been happy in treating in a rather picturesque French fashion the corner inn and shops, and in combining brick and stone and timber with much artistic breadth, though we might accuse his design of a little inconsistence and whimsicality in parts, as the shallow corbelling of the upper floor, corner windows in the tower, the small public entrance doorway, the cornice over dormer windows, the brick interpolation generally.

In the plan there is much that might be improved. The position of the bar is central, but it is hardly near enough to the kitchen for useful service, and its lighting sometimes would be rather doubtful. The public entrance porch is awkward, and the tap-room at the corner could only be reached by passing through the bar, which would be inconvenient. On the other hand, there is a degree of compactness and snugness in the arrangement. There are two entrances, the private part of house is tolerably well cut off from the public, and the bar is sufficiently screened from the entrances as not to be draughty or obtrusive. A bar-parlour 14ft. by 9ft., a tap-room 17ft. by 13ft., a snuggery 12ft. by 11ft. 6in., besides the bar and kitchen, are provided on the ground-floor, and the walls are disposed and broken so as to produce quaint homely comfort. The bedroom plan is convenient. The shops are 16ft. square, with a living room and scullery behind, and two bedrooms over. We fail, however, to see how the stairs is lighted, unless by a skylight. The elevations do not quite agree with the plans: we find a chimney omitted from bedroom over shop. (2) "Pupil J." This design runs the first very hard, and had the rooms of the inn not been so small, we might have placed it first. The author has produced a well-contrived and compact plan, the entrances are well placed; the bar is snugly located in convenient proximity to the kitchen and public entrance, and a small dining-room for strangers is obtained close to the private entrance, well separated from the public part. The stairs, conveniences, and lighting on both floors have been all considered. The shops are small, but the planning and entrances convenient, and there is a private door with vestibule between shop and house, so that the rooms above might be let for apartments if desired. The elevations, in a Late, timbered-gable, Gothic style, are well adapted and characteristic, and the recess with seat, below an overhanging story of the inn, is useful. Grouping and details are both satisfactory, and the author has been successful in imparting a village homeliness, and in losing not an inch of ground wastefully. (3) "Walter." This design has also the merit of extreme simplicity, grouping, and character, it is in an Old English Domestic style, suitable for brick and parget work, but the plan covers more area, and is not economical in arrangement. The large corner bar, 23ft. by 16ft., is too large, and the counter in excess of village requirements; the side entrance is narrow and insignificant, and the staircase would be ill-lighted through the small fanlight over door. The offices are not compact. With respect to the shops, we might say they are roomy, but there is little to commend, and it is to be regretted so well-conceived an external design has not been worked out with more study. The drawing is creditable. (4) "Nemo" has been less successful this time. We can speak with

commendation of his neat effective drawing, and also of the talent exhibited in the details of the elevation, which is in a sort of Gothicised Queen Anne, but it is wanting in rhythm and cohesiveness. The windows on the side of inn are too various in size and style, and the gabled upper story destroys the breadth, and altogether there is too much that is restless in the design. The fault of the plan is that it assumes the pretensions of a small town hotel, and the bar is too large and too far away from the kitchen. One good feature is a club-room on the first floor of inn, but it is rather larger than would be required. The shops are certainly narrow, and the stairs are not well lighted. (5) "Per" is a quietly treated elevation possessing much character; the roof over the shops is kept low, the upper story being lighted from lofty dormer windows which project over the lower ones. The side elevation has been incorrectly drawn, the entrance is shown cramped between the bay windows, while the plan shows a much wider entrance. In the plan the author has run away with the idea of a town hotel. Why the large coffee-room and a bar big enough to supply refreshments at a metropolitan station? "Per" has to learn to plan with economy and effect; his offices are arranged after a very stereotyped town fashion. (6) "Jack" sends a spirited sketch in a kind of Jacobean, racy in parts; but the corner inn is excessively large, the two public bars measuring in area 24ft. by 23ft. 6in, and the planning is more suitable for a small town inn of the first class. Despite its cleverness, there is room for improvement; the upper landing is wasteful and the stairs narrow; while of the shops we may remind the author it is not necessary in a village to occupy nearly 30ft. of frontage with a parlour and staircase, besides the shop. (7) "In Hoc Signa Vinces" fails in the plan; the bar is too large, the corner entrance is objectionable, and the narrow passage from the side entrance, together with the position of bar-parlour and kitchen, are not convenient or well-considered. The elevation, except the narrow pointed corner doorway, possesses merit; the gallery or verandah from club-room window, and the half-gabled treatment of shops are suitable features designed in a sensible manner. Timber framing and tile-hung gables are the principal features, and these are introduced with moderation. (8) "Black and White." There are some good points in the elevations; the style, Late Domestic, has been plainly treated in brick, timber, and tile, but the inn is far too large, and covers a larger area than is desirable; the planning is wanting in compactness, and the shops and private entrances also take up frontage unnecessarily. (9) "Bonus Hominus." A neatly drawn and characteristic elevation, in a Domestic English style, makes the public bar too large, and the entrances and passages destroy the internal economy; the kitchen is too far from the bar and commercial room, and the private entrance is awkwardly planned. The shops are more suitable. (10) "Fidelis" also has mistaken requirements, the corner building has more the pretensions of a hotel, the passages are unnecessary, and the rooms too large. In elevation the treatment, brick and timber work, is suitable and inexpensive for a brick or timber locality. (11) "Black and White" (2). This design, in a similar style, cleverly drawn, indicates merit; but there is a lack of method and grouping in both plan and elevation; the bar and entrance are not well disposed, and there is a general awkwardness in the arrangements. The upper plan is better and shows a large meeting-room. (12) "Cui Bono" is a very effective and neatly drawn elevation in brick and timber framing. The inn, only two stories high, has an octagon-ended bay at the corner, which forms a good recess in the bar parlour, but the public entrance and bar are too narrow, and the bar counter would have been better set further back. The plans of shops, and the way the parlours are squeezed up by the kitchen and stairs, not to mention the position of w.c., and the ill-lighted stairs, are faulty. "Beta" goes in for a large corner bar with side windows, and we must say of the planning that it is wanting in contrivance and compactness; the back passage, too, and conveniences are awkward. The shops also are rather cramped by the passages. In other respects the design is in a suitable Queen Anne brick style, the shops and inn being contained under one line of roof. The billiard-room is a good provision, but the entrance to it is narrow, and the inner passages and bedrooms wasted. "Frank" sends a well-drawn Late Gothic, but expensive row with timber-framed inn, between which and the shops is an archway to a stable yard. The inn is tolerably complete, but unsuited for a village. On the first floor a large club-room, 32ft. 6in. by 15ft. 9in., is obtained, extending over the archway. The shops have a common private entrance between two of them, besides the shop door. The upstair kitchens are objectionable, and would be of service only if the first-floor was let separately. Motto "A" is neat in style, but the stairs to inn are not lighted, and the long passages at side of shops are wasteful. In other respects the design is suitable. "Fiat" has too expensive a plan, and the staircases are not well lighted; the shops also are large. The author suggests a club-room: of the elevation, though rather over-timbered, it is suitable. "Alpha" smacks too much of the suburban tavern; the approach to bar and the other arrangements are not the happiest, and the adoption of a Queen Anne brick style might have been a trifle more in keeping if the corbelled pilasters and other extravagances of the style had been omitted, and a more moderate treatment adopted. "Endymion" is well broken and picturesque in its features. The covered porch and seat is a good feature, and the bar is well placed, but the passages destroy the comfort of the house and take up room. The shop arrangements are fairly planned, at least as regards the stairs and entrances.

Of a numerous class of designs we can only find room to say they have exceeded the conditions and justifiable expenditure, whatever merits they may otherwise display. "Norman" has a large corner inn with public bar, and the elevation is in a brick and half-timbered style, with some respectable features and detail. "Lancaster" errs in the same direction; the entrances are not well managed, and the timbered fronts look finical and too showy; "Kelme" is particularly extravagant in plan and elevation; V in circle, Ernest, Nil Desperandum, No. 2, are also costly in plan or style, and a similar remark as regards plan applies to the design with initials A. L. B., That's my Idea, Trial (the last has an effective elevation), Ambition, Ogmore, H. C. in circle, Nil Desperandum. Some of these designs exhibit ability and careful drawing. A few other drawings must also be enumerated, but their authors have lost sight of the rural character and moderate requirements of a village population. Hubert, York, Hope, B. J., Good Luck to your Fishing, are all weak in planning, more or less, and the elevations in some cases would be far more appropriate in a town or suburb than a rural locality. It is one thing to draw an elevation, but quite another to design it so as to make it agree in character with a particular locality. To seize this character, to make the building harmonise with its environment, should be the great aim of the architect in every work.

Only three designs have been sent us for the sedilia, and, in order of merit, "Con" in circle comes first, "Utile Dulci" second, and "Ogmore" third. Both the former are, however, extravagantly florid. We did not require costly tabernacle-work canopies, but a plain treatment in wood.

WORKED EXAMPLES IN GEOMETRICAL DRAWING.*

THIS is rather a supplementary treatise for the use of students preparing for the examinations than a text-book on geometry. The author, the Rev. John Hunter, M.A., publishes it with a conviction that a greater number of worked examples, especially in scale construction, is necessary than will be found in any other book, and that the solutions of problems should be given with demonstrations. Our knowledge of a few recent text-books corroborates Mr. Hunter's belief, and we think he has been doing a useful service in giving the working out of a few of the more important questions in scales. To give our readers an illustration of the way in which Mr. Hunter handles his subject, we are tempted to quote the first example given. "The distance between two towns is 15 miles, and their positions on a map are 8¼in. apart. Calculate in an explanatory way the representative fraction of the map." After defining the representative fraction of a drawing as the *ratio* that the distance from point to point on the drawing bears to the real distance represented; the author proceeds, "If two towns are 15 miles apart, and two points indicating the positions of these towns on a map are 8¼in. apart, the drawing is on a scale of 8¼in. to 15 miles, or, in common denomination, 8¼in. to 12in. × 5280 × 15, or $\frac{33}{12 \times 5280 \times 60}$; and this abstract fraction reduced to its simplest form by cancelling becomes $\frac{1}{11520}$ which is the representative fraction." Similarly other samples are worked out, and the construction of scales of various fractions are explained, which will be found of great use not only to those preparing for examinations, but to all architectural and engineering students.

The problems worked out are well chosen and useful: such as to divide a straight line into any number of equal or proportional parts; to find proportionals to any other lines; the construction of triangles from given lengths of sides, drawing tangents, &c. The problems are followed by a selection of exercises, many of a useful and practical character, and we have no hesitation in recommending Mr. Hunter's little book to all students and others engaged in instruction.

* Worked Examples in Geometrical Drawing. By the Rev. John Hunter, M.A. London: Longmans, Green, and Co.

MUNICIPAL AND SANITARY ENGINEERS AND SURVEYORS' ASSOCIATION.

A DISTRICT meeting of the Northern branch of this association took place at Blaydon on Friday, Mr. A. M. Fowler, of Newcastle, in the chair. Mr. R. S. Rounthwaite, borough surveyor of Sunderland, read a paper on "Wood Pavements." Nearly two miles of roadway have now been laid in Sunderland with wood blocks, and the author stated that he had had to modify his opinions as to the safety for traffic of the material, and, after considerable experience, now considered that wood paving was no more dangerous than granite sets if it were properly laid, with comparatively close joints, and if kept scrupulously clean. Wide joints served to accumulate dirt, which soon became dangerously greasy, and with 3-inch blocks a space of ⅜in. between each course would be found sufficient. The most recent system of laying adopted in Sunderland was to excavate to a depth of 12in., and then on a concrete foundation of one of Portland cement to one of clean ballast, 3-inch blocks, having a depth of 6in., were laid. These blocks were of seasoned redwood, Memel and Dantzic being preferable to that from Riga, but in any case impregnated with creosote in the proportion of, at least, 10lb. per cubic foot. The joints were run with a mixture composed of one gallon of creosote oil to one cwt. of pitch, alternated three times with coats of fine gravel. A paper on "Roadways" was read by Mr. Jam Hall, borough surveyor, Stockton-on-Tees. Both for broken metal and paved roads the most important matter was the foundation, which should be provided with drains to carry the water to and along the sides of road. For heavy traffic Portland cement concrete was the best foundation, as it improved with age. In the North of England slag was largely used, either by itself or in concrete. Scoriæ bricks, as made and used in Stockton, formed a cheap and noiseless pavement, but their durability varied greatly. Resolutions were passed in favour of having the general secretary of the society located in Lancashire or the West Riding of Yorkshire (Mr. Graham, of Westminster, the late secretary, having resigned), and of having the next annual meeting in London, The members subsequently visited Messrs. Harriman and Co.'s pipe-works; the works of Messrs. Smith, Patterson and Co., ironfounders; and the ironworks of Messrs. Douglas Brothers.

A Local Government Board inquiry was held at Ilfracombe on Tuesday week before Mr. S. J. Smith, C.E., relative to an application from the local board for leave to borrow £4,000 for new waterworks, and £500 for flagging the High-street. At the suggestion of the inspector, the town council agreed to ask for £500 more in order to cover the clerk of works' salary and legal expenses in connection with the waterworks.

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ILLUSTRATIONS.

TOMB TO ARCHBISHOP MEOPHAM, CANTERBURY CATHEDRAL.—SHOPS AT NORWOOD.—LAMBETH INFANT-SCHOOLS.—NEWTOWN CHURCH, EXETER.—NEW OFFICES AT READING.—DRAWING-ROOM, BLACKHEATH, CLONTARF, IRELAND.

OUR LITHOGRAPHIC ILLUSTRATIONS.

TOMB OF ARCHBISHOP MEOPHAM, CANTERBURY CATHEDRAL.

Archbishop Meopham's tomb forms a screen dividing St. Anselm's Chapel from the south aisle of the choir of the cathedral. The canopy of the tomb, together with the large shafts and jambs, is of stone; the body of the tomb, with the small shafts and bases, being of black marble. The date is 1333.

SHOPS AT NORWOOD.

These shops, now building in High-street, Norwood, are from the designs of Mr. Arthur Cawston, architect, of Clement's-lane, E.C. The buildings are in red brick, and are covered with Broseley tiles, the woodwork being painted white.

LAMBETH INFANT-SCHOOL BUILDINGS.

The new infant-school buildings of St. Mary's, Lambeth, have been erected upon a site kindly given by the Archbishop of Canterbury, with a frontage to the high road, a little beyond the church and Palace. The necessary funds were supplied mainly by the accumulated stock belonging to Archbishop Tenison's School, in the hands of the Charity Commissioners, by whom permission was granted to the trustees for its appropriation to the above-named purpose. The buildings are from the design of Mr. John P. Seddon, architect, of No. 1, Queen Anne's-gate, and were erected by Messrs. Belham, builders, of 155, Buckingham Palace-road. The accommodation provided is for 300 children: and comprise a large schoolroom 54ft. by 25ft., and two large classrooms, to one of which is attached a small room to serve as a crèche for the very little children, who, when wearied, may sleep there quietly. There is a playground behind, part of which is covered over. The buildings are well heated throughout by stoves and lighted by gas, and the walls decorated and hung with pictures to give a cheerful aspect. In one of the classrooms the end group of windows is filled with stained glass, the gift of a friend of the school; one couplet, in memory of Mrs. Tait, represents Christ receiving little children, and the other, to Archbishop Sumner, with subjects bearing upon "Faith working by Love." At one end of the group of buildings is a mistress' residence, fitted into an irregular portion of the ground in a somewhat picturesque manner. The entire cost of the structure and its contents has been about £2,500. The materials are stock brickwork relieved with red bricks, and the roofs are covered with tiles. The site having been a portion of the Lambeth Palace grounds, there is a background of foliage giving a pleasant rural appearance in the heart of the metropolis. The Bishop of Rochester, at the recent opening of the schools by the Archbishop, stated that they were the best group of buildings of the kind he had seen, and that by their picturesque and yet modest, unpretending character, excelled the much larger and more costly piles of buildings in their neighbourhood.

NEWTOWN CHURCH, EXETER.

Some short time since there was a competition among local architects for the proposed church to be erected by the Exeter Church Extension Society for a district taken out of the populous parishes of St. Sidwells and St. James. The plans being submitted to Mr. E. R. Robson as professional referee, he reported in favour of those with the motto of "Laus Deo," prepared by Mr. R. Medley Fulford, A.R.I.B.A., of the Close, Exeter, and the Committee followed Mr. Robson's advice, and commissioned Mr. Fulford to prepare the working drawings. The building is to be of local brick, with Beer and Box Ground stone dressings externally; and buff brick from Candy and Co.'s works, Chudleigh-road, with bands of a local red stone, and Hamhill internally. The shafts to the nave columns will be monoliths of red granite. The roofs to be "barrel" ones of deal and pitch-pine, and covered with slate. The only alteration made in the design since the competition is in the west tower; the "saddle-back" tower shown in the original design being at the west end of north aisle, whereas the present one is at the west end of nave, open to the interior, and of more stately proportions. The Newtown board schools adjoin the site, and a portion of same appear in the drawing; they were erected some years since from the design of Mr. P. B. Hayward. The total length of the interior is 121ft., and 64ft. across the transepts, and will accommodate 820 on the ground-floor. There will be a gallery in the tower at the west end. The height, to the summit of the slated roof of tower, is 130ft. The work is to be commenced forthwith, and if funds will not admit of the whole being undertaken this year, a contract will be entered into for the erection of nave, transepts, and aisles, exclusive of chancel and tower above the level of ridge of nave roof.

NEW OFFICES, ETC., ABBEY WHARF, READING.

This building, which is now almost completed, has been erected to meet the growing wants of Messrs. Ridley and Sons, timber-merchants, of Reading and Staines. The work is of simple character, but is substantial in construction. The half-timber work is of solid oak, filled in with brickwork and plaster, the oak generally being left as it came from the saw, and without application of stain or paint, &c. The light for offices is chiefly obtained from the side of the building overlooking the timber-yards, because the roadway being narrow, and the traffic of heavy timber over it considerable, it was thought desirable, both on the score of safety and quietness, to adopt this arrangement. Mr. W. Ravenscroft, of Reading, is the architect.

BLACKHEATH, CLONTARF, DUBLIN.—NEW DRAWING-ROOM.

This sketch gives the interior of a ball-room, which forms part of additions to this house before illustrated in the Building News. The apartment terminates with a semi-circular end, as shown in the view, and has a large bay window on one side, and on the other an ante-room or recess bay, opening into the ball-room proper. The room is about 40ft. long, and 40ft. measured across the bays. The pilasters throughout are framed with moulded walnut stiles and panels of delicate Cinque-cento-like work, in low relief in sycamore; it being intended to body-in the ground in low-tone colour, leaving the sycamore in the carving of its natural colour. Dublin has been always famous for its beautifully free and artistic stucco-work of the last century, the work of Italian settlers and French refugees, and it is much to be regretted that before this all disappears, some enterprising artist does not undertake the drawing and publication of some of the good examples of ceilings, &c., hundreds of which remain in private houses and elsewhere; while in the last few years hundreds have disappeared. An attempt has been made in the stucco-work work of this new ball-room to revive something of the high artistic character and freedom of modelling suggested by old examples, and all the enriched work has been specially modelled by Messrs. Sharpe and Emery, architectural sculptors, of Dublin, and finished by a carver; some of the details, such as birds, &c., being fixed in rough plaster and carved in their places. The result has been work of more than ordinarily good artistic character, at a by-no-means extravagant cost. The architect is Mr. Thomas Drew, R.H.A., of Dublin.

COMPETITIONS.

Pontefract.—A special meeting of the Pontefract Corporation was held in the Town-hall on Thursday, Feb. 24, the Mayor (Mr. John Rhodes) presiding. The sub-committee of the proposed new town-hall produced the amended plans as altered by Messrs. Bulmer and Perkins, of Leeds and Harrogate, the estimated cost to be £7,400. Mr. Barker proposed and Mr. T. Wordsworth seconded a proposition that the plans be not received, inasmuch as the previous estimate of £7,000 had been exceeded. Alderman Gott moved that the minutes of the committee be confirmed, which was seconded by Mr. Barstow, and supported by Ald. Robson, and on being put to the meeting the amendment was carried by 16 to 7 votes. It was further resolved that the new Town-hall committee be empowered to at once proceed with the work, and advertise for tenders.

Trades' School Competition, Bristol.—The Society of Merchant Venturers of Bristol desire to put up a healthy and commodious building at as small a cost as is consistent with thoroughness, abundantly supplied with light and air, and so arranged as to be well adapted for technical, scientific, and general work of the kind now carried on in science schools. In response to their advertisement, 21 sets of plans were sent in, the estimates of cost varying from £12,000 to £22,000. The society have awarded the premium of £100 to Mr. Stuart Colman, of Bristol. They were assisted in making their selection by Mr. Robson, the architect to the London School Board, who reported upon the whole of the plans sent in.

Burton-on-Trent Workhouse.—At the meeting of the Burton board of guardians held on Thursday, the 24th ult., a report was received from the building committee as to the designs for the new workhouse, obtained in the recent limited competition. These had been sent in by Mr. J. H. Morton, of South Shields, the cost of which was estimated at £35,538 1s. 11d., and by Messrs. Wilson, Son, and Aldwinckle, of London, the estimated cost being £32,772 6s. 2d. The committee recommended the adoption of Mr. Morton's plan, and explained that the extra cost of £2,538 was due to the fact that all the buildings were designed by Mr. Morton as two-storied. The board adopted the report, and accepted Mr. Morton's design, appointing its author architect for the new workhouse, at a commission of 4½ per cent. on the total cost of the buildings. A premium of £30 was voted to Messrs. Wilson, Son, and Aldwinckle.

CHIPS.

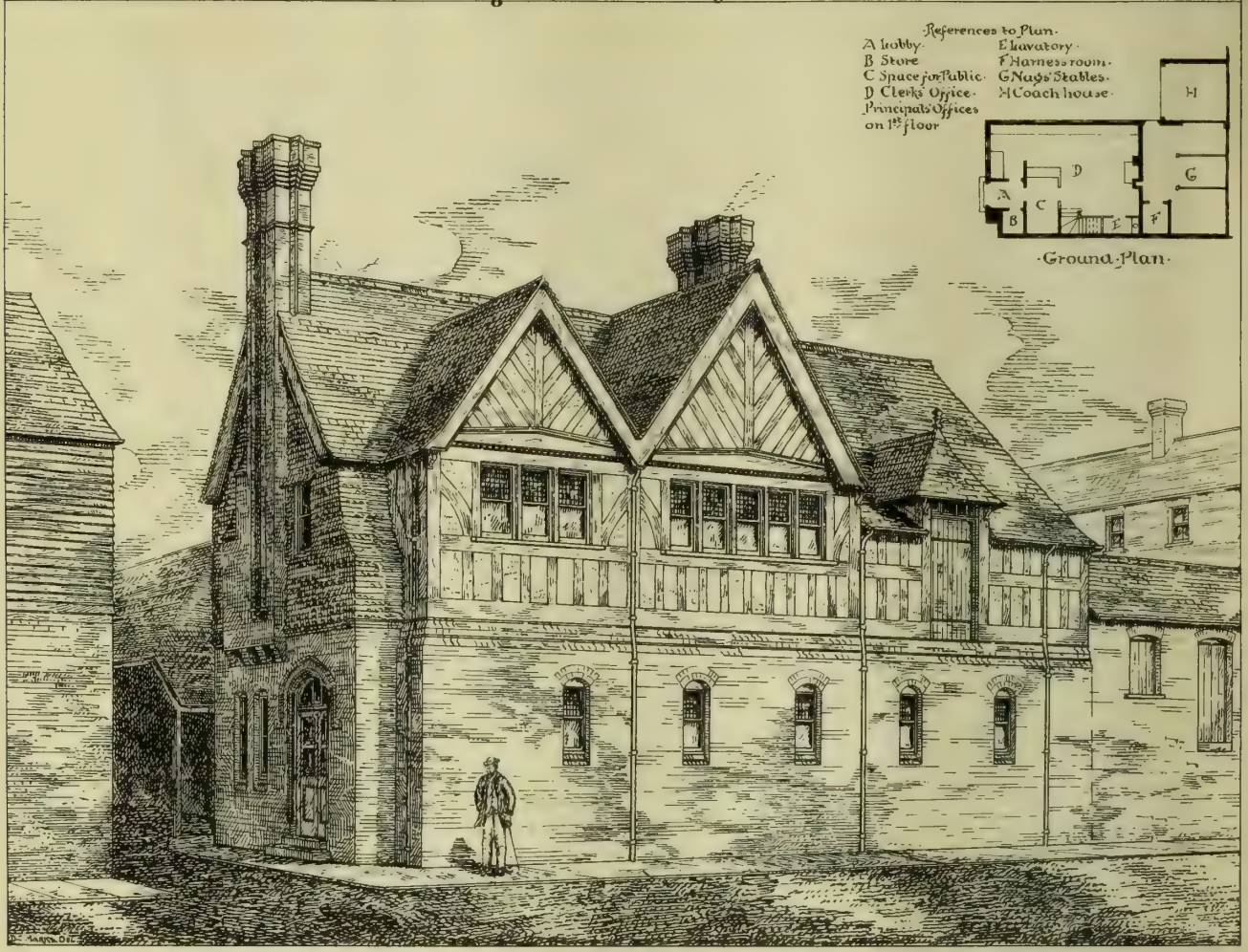
The dates fixed for the sending in of works intended for the annual exhibition of the Royal Academy have just been published, and are as follows:—For paintings, drawings, &c., Monday and Tuesday, March 28 and 29; for sculpture, Wednesday, March 30.

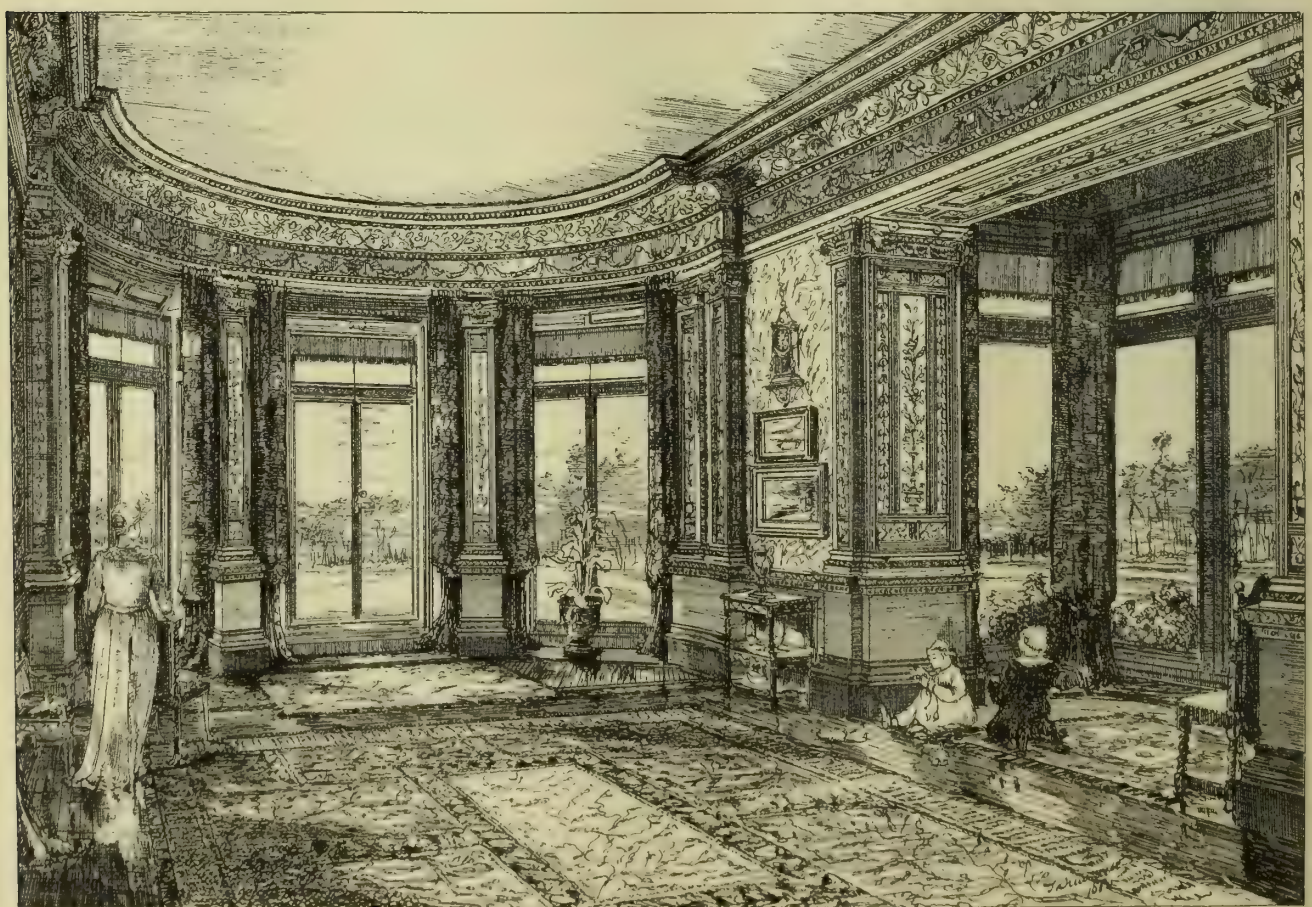
The Stock Exchange is about to be considerably enlarged, from the design of Mr. J. J. Cole, of 24, Finsbury Circus, at a probable cost of a quarter of a million.

The Wolverhampton Board of Guardians opened on Feb. 18th twenty tenders, ranging from £2,078 to £3,076, for the extension of the workhouses premises, on the Eagle-street side, and accepted the lowest, that of Mr. S. Teece, of Darlaston, who had amended his tender previously to the meeting of the Board by striking off £110; it now appeared on breaking the seals that even at £2,188 it would have been the lowest offer.

The restoration of the west front of Lichfield Cathedral is progressing, and the north-west spire has just been commenced; it is found to be in worse condition than had been anticipated. The new figure of Peda has just been placed over the central door in the great façade; and on Thursday week the figure of Our Lord, given by the Bishop and executed by Miss Grant, arrived in the city; it will replace a statue of Charles II. over the west window.

New Offices &c. Abbey Wharf Reading for Messrs. Ridley & Sons Timber Merchants. W. Ravenscroft. Architect 1881.



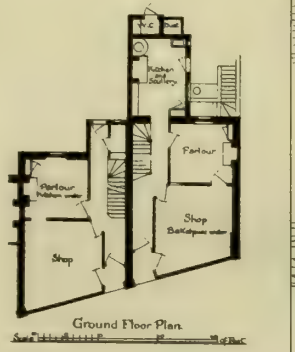


DRAWING ROOM BLACKHEATH CONTARF IRELAND
THOS. DREW R.H.A. ARCHITECT

Photo Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

SHOPS · AT · NORWOOD ·

Arthur · Cawston · ARCHITECT.



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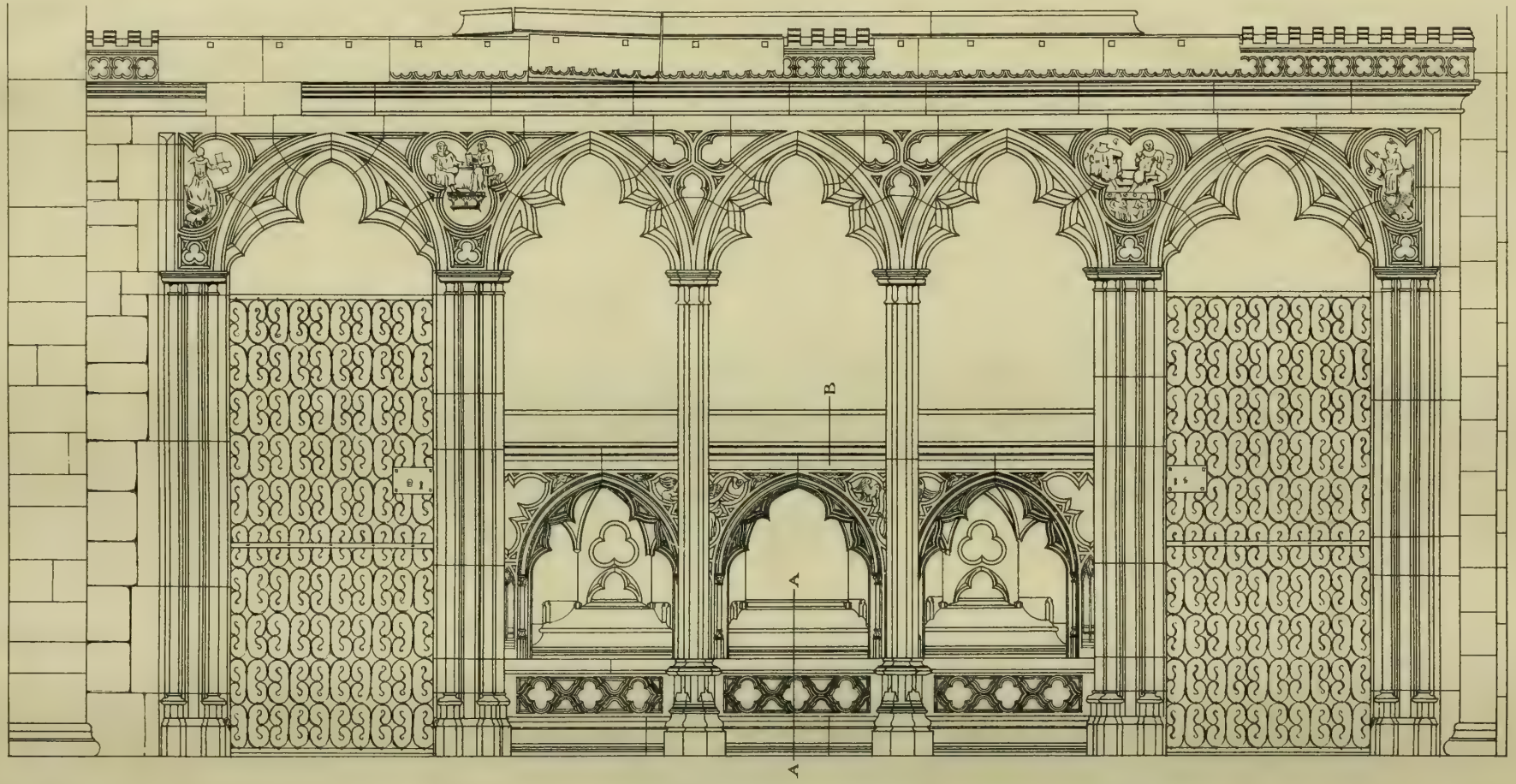
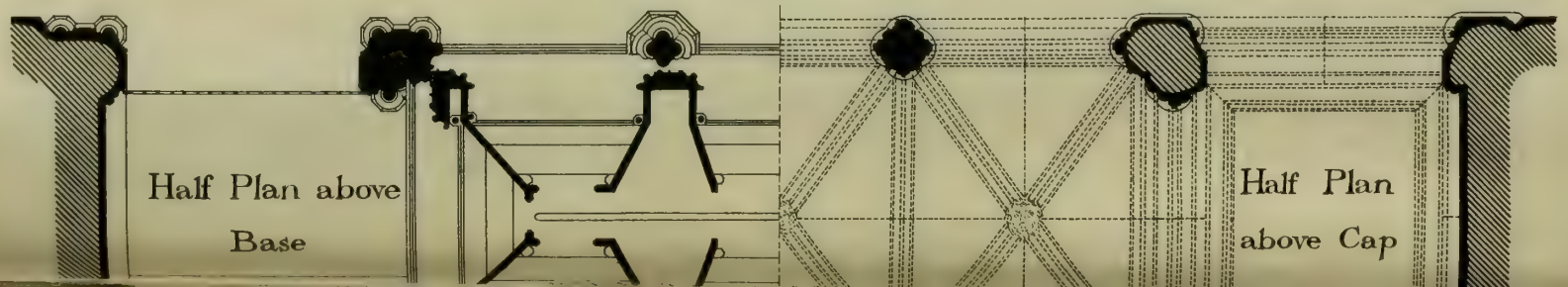
Tomb of Archbishop Meopham: Canterbury Cathedral:





Scale 0 1 2 3 4 5 6 7 8 of Feet

Measured and drawn by
Arthur Keen Sep[t] 1879.

Base, Plan, and Cap, of
Large Shafts

Section of
Cresting

Plan above Cap, shewing
Vaulting Ribs, etc.

Section A—A

Section B

Section of
End Arches

Section of
Lower Arches

Section through Centre Bay:

Section through End Bay:

Base, Plan and Cap of Small Shafts

Scale 0 1 2 3 4 5 6 7 8 of Feet

Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W C

LAMBETH INFANT SCHOOLS

JOHN P. SEDDON ARCHITECT

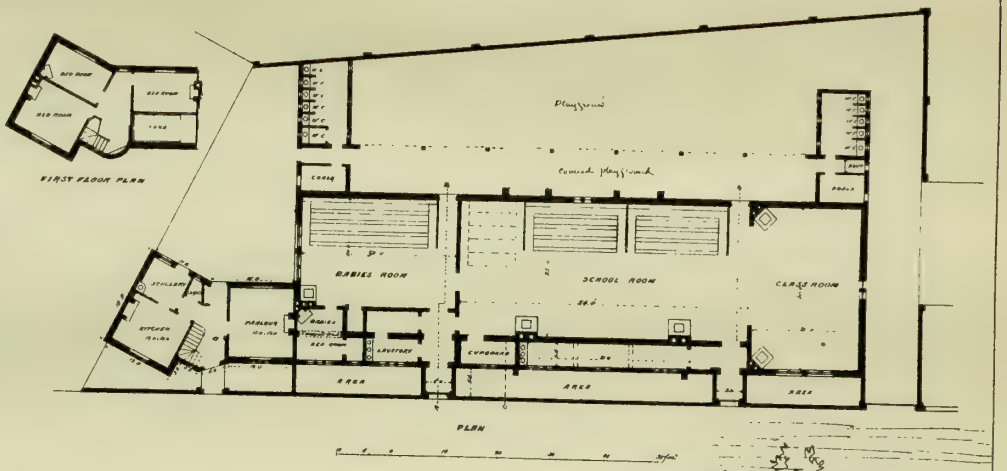
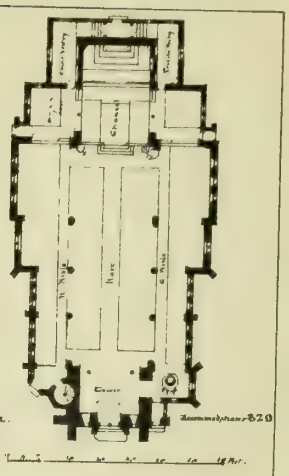


Photo Lithographed & Printed by James Akerman 6 Queen Square W C

Newtown Church, Exeter. S.W. view.

R. Medley Fulford Archt. Exeter.



Ground Plan.

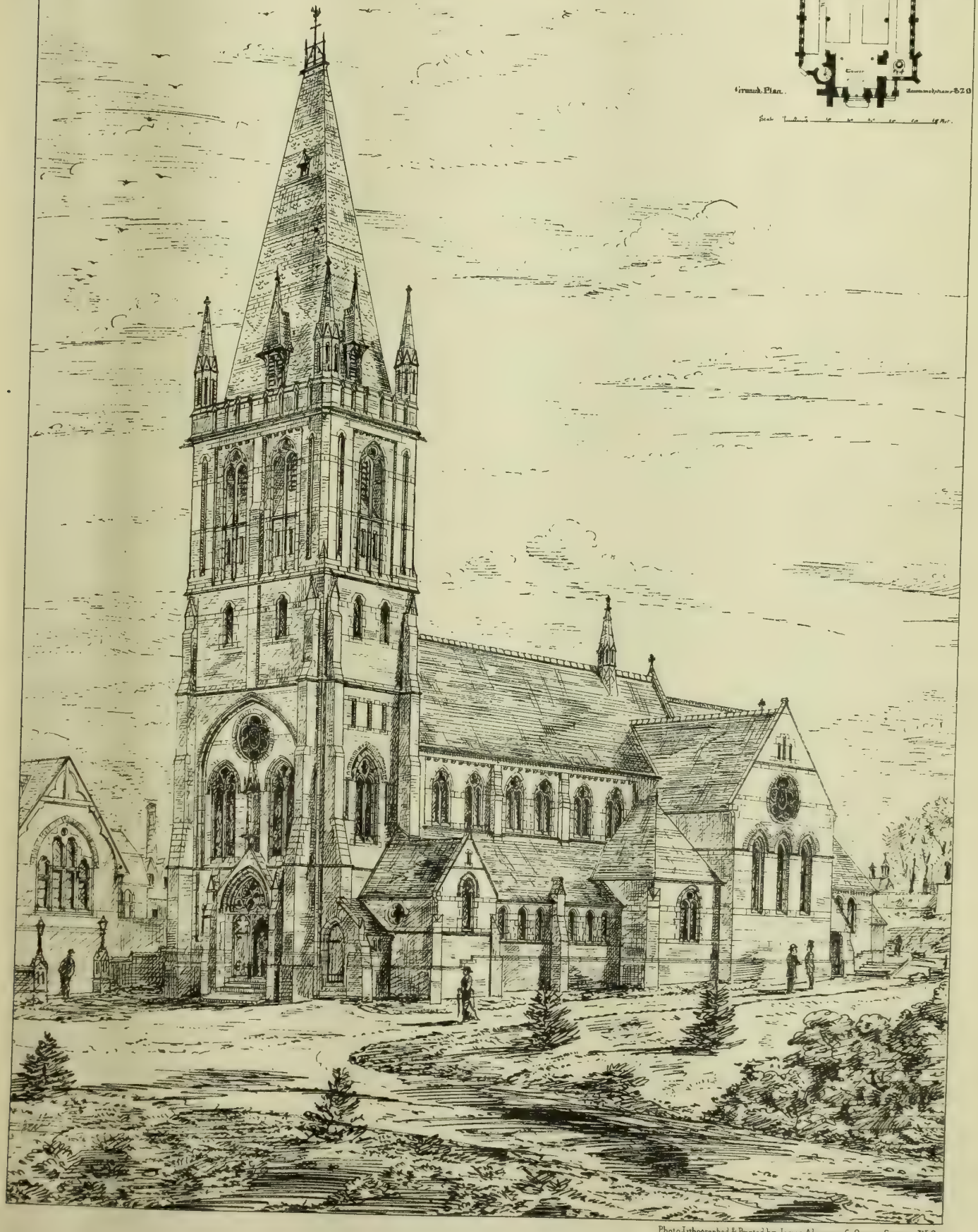


Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

BOOKS RECEIVED.

Lockwood's Builders' and Contractors' Price-Book for 1881 (London: Crosby Lockwood and Co.) has had several additions made to it in the particulars and prices of labour and material, and will therefore be found more useful than ever. ——*Spons' Architects' and Builders' and Contractors' Pocket-Book for* 1881 (London: E. and F. N. Spon) is considerably extended, but is, nevertheless, as handy and convenient as it is accurate and reliable.——*Bevis's Builders' Price-Book for* 1881 (London: Bevis and Co.) has, it is stated, had a very favourable reception, and is now issued for the fifth time.——*The Rudiments of Civil Engineering*, by Henry Law, Sixth Edition, revised by D. K. Clarke (London: Crosby Lockwood and Co.), has been almost rewritten by its reviser, who has added nearly three hundred pages of fresh matter, and has brought an old and reliable text-book thoroughly up to date.——*Measures, Weights, and Moneys of all Nations*, by W. H. B. Woolhouse, F.R.A.S., &c. (London: Crosby Lockwood and Co.), is the sixth edition of an exceedingly useful volume of Weale's Rudimentary Series. The work also embraces an analysis of the Hebrew, Christian, and Mahometan calendars.——*Electrotyping*, by J. W. Urquhart (London: Crosby Lockwood and Co.), has some good information in it; but much more that is mere padding. The first part of the book might have been condensed considerably, and the second—which alone really treats on the subject-matter indicated by the title—is not always reliable, and seldom coherent. ——*What Girls Can Do*, by Phillis Browne (London: Cassell, Petter, and Galpin), is the second edition of a very pleasantly-written book for mothers and daughters.——*A System of Practical Arithmetic, for the Use of Schools*, by Samuel Young (London and Manchester: John Heywood), contains much information not usually to be found in treatises on arithmetic, having special reference to cotton-spinners, millwrights, engineers, and builders.

PROF. NEWTON ON GREEK ART.

THE third of the course of lectures on Greek Art in the age of Pericles, was delivered by Professor Newton, on the 4th ult., at the University College, and dealt with architecture and history of the Parthenon, and its chryselephantine statue of Athené. The temple of Athené Parthenos was shown to have consisted of two unequally-sized chambers, of which the smaller, that at the rear, was the treasury, and the larger contained the magnificent statue of Athené, constructed in ivory and gold by Phidias. This temple was finished about B.C. 438, and remained perfect till at least the time of Plutarch, who, in the second century of our era, described it as possessing all the freshness of youth. Converted into a church on the establishment of Christianity, it was used successively by the Byzantines, the Latins, the Venetians, and the Turks, by the last of whom it was refitted internally to serve the purposes of a mosque, and it was finally restored to the Greeks about half a century since. The exact position in the temple of the famous chryselephantine statue was unknown; the older opinion was that an oblong space on the floor of the larger chamber, paved with inferior marble, marked its site, but German archæologists had held that the statue stood much closer to the wall dividing the chambers, and they had professed to see traces of a recess in this wall. Mr. James Fergusson had adopted the older theory as to position, but propounded a new view as to the Parthenon itself, which he said was not an open space, but roofed over, and lighted by clerestory openings. The statue itself was stated by ancient writers to have been 32ft. high, exclusive of the base; it was of gold and ivory, the flesh being represented by the latter and the garments by the former material. Many rude and imperfect representation of the statue existed on coins, gems, &c., but these did not agree with one another. The most noteworthy of modern restorations was that made by M. Quatremère de Quincy, about half a century since, which curiously agreed with the independent restoration made by Flaxman for his lectures on sculpture, but both of which had been proved to be inaccurate by comparison with ancient delineations, and still more on reference to the statuette of the same goddess recently found in Athens. The lecturer then described the rich frieze which surrounded the exterior of the cella, the well-balanced sculptural compositions in the pediments at either extremity of the temple, and the vigorous metope subjects between the triglyphs, explaining that a great portion of these beautiful sculptures were now to be seen in the galleries of the British Museum.

The fourth lecture of the course, delivered a fortnight since, was devoted to the recently discovered statuette of Athené, which was illustrated by photographs and a drawing to full size. Professor Newton pronounced it to be a reduced copy, in the dull, lifeless, Roman manner, of the famous statue. In this statuette, which was of marble, the goddess had a helmet with three high crests, and having a sphinx in the centre and a griffin on each side. Over the breast was the ægis covered with snakes, in the centre of which was the Gorgon's head. Below this was a richly-flowing garment, flowing to the feet, and this was apparently folded or covered an under garment. The arms were bare; in the right hand was a victory, unfortunately headless; the left hand rested on a shield. This statuette agreed with the description by Pausanius of the chryselephantine statue, in which it was stated that on the outside of the shield held in Athené's left hand was depicted in relief the battle of the Greeks and Amazons, and on the inside the battle of the gods and giants. He also referred to a spear, held in the left hand as well as the shield. Under the right arm of the statuette was a column, for which there was no authority, and which the lecturer believed was only introduced to support the arm of the statuette. The figure of Mercury carried in the right hand of the original statue must, he thought, have been supported by a bar of copper, concealed in the frame-work upon which the gold and ivory was built up. Professor Newton announced that his fifth lecture would be delivered on the 4th March (to-day, Friday) at 4 p.m., when he would describe the frieze, and that a supplementary lecture would be delivered on the following Friday, the 11th, in which he would treat of the sculptures of the Temple of Zeus, at Olympia.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Birmingham Architectural Association.—On Saturday afternoon last the association visited the new Wesleyan College, at Handsworth, which is now approaching competition. Owing to the inclemency of the weather, there was only a small number of members present, among them being Messrs. E. Pincher, E. Wood, and W. H. Kendrick, of West Bromwich, F. E. F. Bailey, and J. Ellis, of Walsall, Fred. G. Hughes (hon. sec.), &c. The architects, Messrs. Ball and Goddard, being unable to attend, Mr. Osborne, the clerk of works, conducted the party. An ordinary meeting was held on Tuesday evening (March 1), at the Rooms, Queen's College. Mr. O. Essex occupied the chair (Mr. Morgan, the chairman, being absent). A vote of thanks was passed to Messrs. Ball and Goddard, architects of the new Wesleyan College, Handsworth, for permitting the members to visit that building on Saturday, the 29th ult. A vote of thanks was also passed to Mr. Osborne, the clerk of works, for meeting the party. Mr. A. Reading delivered a brief lecture entitled, "The Proportions of Ancient Classical Buildings and their Application to Modern Design," for which a vote of thanks was accorded to him.

The annual dinner of the Lincoln Master Builders' Association took place the other night, Mr. W. Kirk, president, occupying the chair, and Mr. H. S. Close the vice-chair. It was reported that the Association was in a highly satisfactory condition. The Vice-President and Secretary both spoke upon the Employers' Liability Act and its probable effect on the building trades, and it was stated that a general insurance fund was proposed to be established by the National Master Builders' Association.

Instead of oil, which thickens and makes the stones dirty, a mixture of glycerine and alcohol is used by many. The proportions of the mixture vary according to the instrument operated upon. An article with a large surface, a razor, for instance, sharpens best with a limpid liquid, as three parts of glycerine to one of alcohol. For a graving tool, the cutting surface of which is very small, as is also the pressure exercised on the stone in sharpening, it is necessary to employ glycerine almost pure, with but two or three drops of alcohol.

Building Intelligence.

Bournemouth.—The new church of St. Paul, Bournemouth, was consecrated on Tuesday week. The first portion of the church has been erected from the designs of Mr. Augustus H. Parken, F.R.I.B.A., Bournemouth, and is in the Early English style. At present, an apsidal chancel, north and south transepts, a central tower, and two bays of the nave and north aisle only are built. This portion will accommodate about 300 worshippers. The rest of the nave, and possibly a south aisle too, will, it is hoped, follow at some early future date, and the church will then afford sittings for 700 persons. The exterior walls are of Purbeck, and the dressings are of Bath stone. The pulpit, which is the gift of the architect, is of Bath stone, and is the work of Mr. Harry Hems, of Exeter. The contractors for the whole of the works are Messrs. Hale and Son, of Salisbury. The tile pavements were supplied by Mr. W. Godwin, of Hereford.

Bristol.—A new Baptist chapel, at Totterdown, was opened yesterday. The new chapel will accommodate 500 persons on the ground-floor. The style is Italian, and the chapel 40 feet wide, 82ft. long, and 26ft. high to wall plate 38ft. to collar-beam. The general contract has been taken by Mr. A. J. Beaven, of Bedminster, at the sum of £2,175. The work has been carried out under the superintendence of Mr. Alfred Harford, architect, of 30, Broad-street, Bristol.

Edingale.—On St. Matthias' Day the church of the Holy Trinity, Edingale, was reopened, after having been entirely rebuilt under the direction of Mr. Charles Lynam, architect, Stoke-on-Trent. The new church consists of a nave, chancel, and vestry leading out of the chancel, with tower carried up over the vestry to the height of about 50ft., and including organ-chamber, belfry, and heating chamber. It is in Early English style, and is built of red brick with stone dressings, lined internally with white brick. The roof is open-timbered, and the flooring is of plain tiles with wooden bricks between the seats, which are open benches. The nave is artificially lighted by Jones and Willis' new Hesperus lamps depending from the roof-timbers. Accommodation is provided for 130 worshippers. The work has been performed by the contractor, Mr. Robert Young, of Lincoln, and the total cost has been about £1,800.

Haworth.—On Tuesday week the church of St. Michael and All Angels, Haworth, and erected upon the site of the old church, so closely associated with the Brontë family, was consecrated. The style of the new church is Perpendicular, and the masonry is of local sandstone. The interior of the church presents the usual features. The roofs are of stained deal, that of the nave being of hammer-beam construction, with moulded intermediate rafters. The interior walls are plastered, and they will shortly receive decoration. The whole of the arches, capitals, &c., are of simple masonry, without carving or elaborate detail, the only exception to this rule being the blank arcade, or panelling in the eastern bay of the chancel. The old tower is worked into the new building. Accommodation is afforded for 500 adults and 130 children. The cost will be about £7,000. Messrs. T. H. and F. Healey, of Bradford, are the architects.

Claughton.—Christ Church, Claughton, was opened last week after enlargement. A new north chancel aisle, with additional sitting accommodation for 70 worshippers, is provided, whilst an organ-chamber and vestry correspond on the south side. The space formerly occupied by the organ in the west gallery is now seated to accommodate an additional 120 free sittings. The heating arrangements have been carried out by Mr. Gibbs, of Liverpool. The general works have been executed, at a cost of over £2,000, by Mr. James Bratt, contractor, of Rock Ferry, from the designs and under the superintendence of Mr. David Walker, architect, of Liverpool.

Denmark Park, S.E.—The new church of St. Saviour, Copleston-road, S.E., was consecrated by the Bishop of Rochester on Tuesday week. It consists of a nave with aisles, transepts, and chancels, and seats 1,000 persons. The style is Early English, and the walls are of white brick facings, with Bath stone dressings. The internal wall surfaces are of gauged brickwork, and

the voussoirs of arcades are of alternate courses of blue and white stone. The roof is parallel, and the building is pewed. Above the altar is a window filled with stained glass by Messrs. Gibbs and Howard. Beneath the church is a vestry and other offices, and adjoining is a parsonage, provided, like the church, at the sole cost of Mr. Francis Peek. The architects were Messrs. Weeks and Hughes, of Tunbridge Wells; the builder was Mr. E. Terry, of Bellenden-road, Peckham, and the clerk of works was Mr. S. Burdett.

Metropolitan Board of Works.—At the meeting of this board on Friday, plans prepared in the superintending architect's department for the enlargement of the head-quarters of the fire-brigade in Southwark-bridge-road were adopted, and the brigade committee were authorised to make arrangements for the erection of the new buildings; the estimated cost was between £13,000 and £14,000. A communication was received from Sir W. V. Harcourt, stating that he could not, as Home Secretary, sanction the proposal in the Board's Various Powers Bill to repeal the 33rd section of the Streets' Improvement Act, relating to the provision of accommodation for the labouring classes who might be displaced. It was decided to refer the matter to the works committee, with power to withdraw the clause if necessary for the passing of the Bill. Revised plans of the works proposed to be carried out for the prevention of floodings in the Chelsea district, and prepared in the engineer's office, were adopted.

Leicester.—The new buildings for the Leicester Secular Hall, now completed, occupy the site of the old Secular Club premises. The style is a free treatment of Flemish Renaissance. Above the ground-floor, which is built of best hard buff Darley Dale stone, the front is executed in very thin brownish-red Coalville bricks, with white mortar joints, except the moulded and carved portions, which are in bright red rubbers, and the pediment copings and similarly exposed parts, which are of red Mansfield stone. The portion of the front—the tower—constituting the house, has the regulation 18th-century panes of crown glass, the windows falling in the gable of the Hall proper being all glazed with antique glass in leads. The roofs are covered with brown Broseley tiles. In the carved capitals of the five stone pillars which carry the front on the ground-story are to be read the names of Socrates, Jesus, François Michel Arouet de Voltaire, Thomas Paine, and Robert Owen, and in corresponding niches just above occur busts in red terra-cotta of these worthies, while bronze belts round the pillars will be inscribed with quotations from their utterances. The accommodation comprises the following:—On the first floor, the lecture-room; on the ground-floor, the general club-room, 66ft. long and 22ft. wide, with bar, committee-room, and Freethought book-shop; on the basement-floor there is a large room, about 55ft. by 22ft., paved with a peculiar hard, light-coloured concrete, suitable for bowling, billiards, or other purposes. The architect was Mr. W. Larner Sugden, of Leek; Mr. William Bailey performed the duties of clerk of the works.

SCHOOLS OF ART.

Nottingham.—The annual distribution of prizes to the students in this school was made by Lord Sherbrooke on Wednesday week, when reference was made, by most of the speakers, to the change of head masters which had recently taken place, Mr. J. S. Rawle having left to occupy a similar position at the West London School of Art, and having been succeeded by Mr. Dalgleish. Silver medals were awarded to W. H. Wightman, Gilbert S. Doughty, Thos. Dutton, A. Middleton, J. Clews, Lucy A. Leavers, Arthur Marshall, H. G. Smith, A. W. Brewill, G. G. Simpson, W. R. Walton, J. Farnsworth, Ada Fussey, M. H. Goodyer, W. Hardy, T. Meldrum, J. Simons, F. C. Vessey, H. Williamson, and J. W. Wood; the mayor's silver medal was taken by Jas. C. Butler; 109 third grade medal prizes, and 115 second grade prizes, besides many certificates, were also awarded.

Bromley, Kent.—The annual meeting in connection with this school took place on Friday. The report showed that the number of students who attended last year was 113, showing an increase of 38 on the previous year. 41 students had sent 126 works to the annual examination at South Kensington; but they had not been successful in obtaining a single third grade prize; 36 second grade certificates had been gained by the 50 students who competed.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

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Correspondence.

THE SUPERVISORS OF METROPOLITAN BUILDINGS.

To the Editor of the Building News.

Sir,—Permit me to thank you for the insertion of my letter on this subject. The reply from the writer of the article considerably modifies the charges first made. But I must still demur to his qualified statements:—

1. From the frequent proceedings that I have taken under the Building Act and other causes, I have been brought in close contact at various times with every district surveyor in the Metropolis, and though it is satisfactory to learn that the writer only intended to refer to some half-dozen district surveyors when he spoke of their "narrow capacity, culture, and ability"; yet I venture to assert that he is not justified even in this statement. There are, by the Directory, over 900 architects and building surveyors practising in the Metropolis, and I assert that for knowledge of building construction and the special ability required in the position, district surveyors are far beyond the average of the general practising London architects. My proofs of this are the following:—In my own district office I have records of some 40 cases where architects have attempted to carry out construction, which was not only illegal, but absolutely dangerous. I have also a large collection of photographs of failures where architects have been employed, and which I shall be happy to show your correspondent. I have been engaged in professionally investigating most of the building casualties which have occurred during the last six years in London, and in nearly all of these, architects have been engaged. Most of the district surveyors have carried out large works on their own account; but there is no instance on record where any practising district surveyor has had a serious accident occur to works under his own control. I have frequently heard architects in law-courts give such evidence as the following:—That it is possible to form an opinion as to the safety of an old party-wall by looking at it only on one side, or without examining the base or foundation! I have heard them swear that bricks, copings, and chimney-pots falling from roofs would not be likely to hurt people! That brickwork three courses to the foot with 1¼in. mortar joints was sound work! That insufficient cast iron was not dangerous till actually cracked and falling! I assert that no district surveyor would be guilty of these acts or words, and I retort the charge of "narrow culture," &c.).

2. I am glad the writer says he does not insinuate that district surveyors wink at the doings of speculative builders; but he thinks the system tends to make them do so. I care far more for facts than tendencies, and the facts I gave in my last letter prove they do not. But, more than this, I assert that district surveyors have strained the law as far as they can to stop speculating builders' rascality; the Building Act was originally intended simply to prevent the spread of fire, and till last year there was nothing in it to touch insufficient and bad materials, and even now the only way to stop scamping buildings in this respect is to report the work, when so done, as dangerous and get a magistrate to condemn it; the Act as regards dangerous structures was never originally intended to be worked for this purpose. I was myself the first to apply it in this way, and the fact that the other district surveyors have followed my example till the dangerous structure cases have quadrupled, proves that whatever the tendencies Act may be, the facts are against the author's conclusions.

The writer says I am opposed to reform; here he is also mistaken. The strenuous attempts that I have made for the reform of the working of the Building Acts is a matter of notoriety throughout the profession, and it is well known that for two years I spent the whole of my district income in this manner: and, having never yet summoned a builder for a fee, I have a right to be heard on this subject. The case mentioned by the writer where he was informed a builder had paid an excess fee is a remarkably weak one, even on the face of it; he says "the builder informed him." If the writer assumes his facts on information supplied by builders against district surveyors, no one will be surprised at any views he may adopt. Would he take the opinions of wolves on the character of sheep-dogs?

He asks, What check is there on district surveyors? It so happens there is a very efficient one. The Metropolitan Board of Works comprises 48 members; these gentlemen represent 56 parishes, which have an aggregate of over 3,000 vestrymen. District surveyors are compelled to give a receipt on an official form for every fee they take, giving the squares of the buildings and full particulars; and any builder or other person who thinks he has paid an excess fee has only to mention it to a vestryman of his parish, who can bring it at the next meeting before his representative at the Board of Works, and the matter is at once investigated. This kind of case is continually occurring, and almost invariably it is found that the district surveyor is right, and I challenge the writer to produce even five cases during the last year where throughout the whole Metropolis any district surveyor has charged an excess fee, and if he will give me the facts I will myself investigate the cases (in confidence) and bring them before the Committee of the District Surveyors' Association and the Board of Works. Under the present Building Act it is impossible to pay district surveyors by salary; some districts are not worth £100 per annum, and several not £200. The writer says public roads are surveyed at the public expense, why not public buildings? He seems to be unaware that theatres, lecture-halls, &c., are private property, that district surveyors' principal duties are to survey private, not public, buildings; and I imagine that till the writer gets the law altered

so that fees for private scaffolds and hoardings, court fees for lawsuits, and similar matters, are paid by the public, he will not get the cost of supervising private buildings defrayed at the public expense. As regards the next subject, viz., appeals to the Metropolitan Board of Works from the district surveyor's decision, the writer's last shot at me falls harmless. I have probably in the neighbourhood of Charing Cross more cases of public buildings to deal with than any other district surveyor in London; and though I have had to meet many leading architects in these cases in no instance has my decision been appealed against; the only case when my name has been before the Board being when I reported the iron-work for a certain building dangerous, and the Board, with their usual courtesy, helped the architect out of his difficulty by referring the matter to their engineer, who showed him how to tie up the building.

In my last letter I purposely abstained from saying anything with reference to the insinuation that district surveyors in their official transactions fail to conduct themselves as "gentlemen dealing with gentlemen." District surveyors have often a delicate task to carry out in informing other architects that their plans are contrary to the law, or that their client's buildings are dangerous, and it is not to be wondered at that occasionally ill feeling or some display of temper is evoked; but I assert that, as a rule, district surveyors soon become, from the frequency of these cases, a remarkably even tempered and considerate set of men; and they are no more annoyed at these little displays of temper than a surgeon is at the fractiousness of a patient under an operation.

Under the Building Act district surveyors are compelled to meet no one but the builders actually doing the works, and they have no responsibility till they have certified their completion "to the best of their knowledge and belief" under the Act; but all of us, as a matter of courtesy, are in the habit of continually meeting architects and arranging matters with them beforehand, in order to save their clients delay and expense; but is it fair in return for receiving this consideration at our hands, to demand it as a right and bring a charge of discourtesy against us when differences occur? In my own practice I have made it an invariable rule, whenever any question arises and I find that an architect is employed, to write him at once, and in almost all cases this courtesy is gratefully received and generously reciprocated; but I have met with some strange instances to the contrary. One surveyor, upon my proceeding to inspect a dangerous structure by the order of the Board, seized a sledge-hammer and threatened to dash out my brains if I ascended a ladder to do so. I obtained the assistance of the police, who removed him from the building. Another architect, while discussing a question as to the strength of iron-work, upon my differing with him, suddenly stigmatised me as a scoundrel. I have been informed more than once that I should some evening be knocked down in Leicester-square; certain members of my own profession have frequently described me as mad, crazy on dangerous structures, and fool to my own interest, &c. But none of these things have moved me, as I fully expected that any fair attempt to promote the enforcement of the law for the safety of buildings would evoke this opposition; but the result in my case has proved that I was right, as in every instance I have succeeded. Magistrates, at first indisposed to convict, have become convinced by the inexorable logic of facts, and from the numerous building casualties which have occurred; and though the greatest difficulty I have had to meet with has been the opposition of incompetent so-called architects, as ignorant of building law as they are of construction, yet I am pleased to find that every day I receive fresh proofs of the gratitude and confidence of the residents and householders in my districts.

The thanks of the district surveyors are eminently due to the Building News for its efforts to put down bad building; but if one district surveyor has been guilty of practices that reflect any discredit on himself or his colleagues, we have a right to demand that facts and names be published, or at least sent to the Committee of the District Surveyors' Association, where they will be properly investigated; but after the determined effort that has been lately made on our part to stop bad and unsafe building, as well as reform the law, it is, I submit, too late to make general charges against even one member of our body without following them up and proving them to be either false or true. The true blot in the working of the Building Act, is that magistrates will not enforce adequate penalties on builders; and till this is done the law is practically powerless. I intend shortly to bring before the public glaring instances in proof of this statement.—I am, &c.,

Robert Walker, F.R.I.B.A.,
District Surveyor of St. Martin's-in-the-Fields, and St. Anne, Soho.

21, King William-street, Strand.

THE INSTITUTE AND ITS PAPERS.

Sir,—The leading article in your issue of the 18th ult., touched, I am sure, a chord of sympathy in every member of the Institute.

Assuming that the papers read at its meetings would be considered by visitors and outsiders as some approach to the measure of the capacity of the Institute as a body, it may not be out of place to review the repast which we have had served up at the intellectual banquets of the present session. The "Menu," as sketched in the Opening Address by the President, seemed to prospect freshness; he reduced the number of courses, but promised that the food should be more substantial, and hoped that the three stewards would supervise "fearlessly" the duty imposed on them; and what have we had? Too much soup, very little fish, plenty of made dishes of the usual doubtful character, but a positive absence of real cuts from the saddle and sirloin.

The first paper read, "The Modern Barrack," by Mr. Ingress Bell, was a good honest meal, and all went away satisfied. The second paper, "Sanitary Science," by Mr. E. C. Robins, was, on the contrary, unsatisfactory. As a discourse before what we are bound to consider a body of practical working architects, it might, I think, be considered obtrusive. I listened, and have read, in vain to find in it anything which is not practised by every architect of the day who knows his business. I admit that the paper was carefully prepared, and for its painstaking character deserved the warm thanks of the members; but at the Institute, if we may accept Lord Palmerston's definition, it was *dirt*, simply "matter in the wrong place." Before amateurs, or students in architecture, it would have been appropriate, but before *architects* it lost its *raison d'être*. I am afraid, however, that this might be said of more papers than Mr. Robins', and it is rather to the *discussion* on his paper that the annoyance experienced by many members may be attributed. We have had specialists, professors, and others occupying two whole evenings in lecturing architects on the preliminaries of their sanitary education. Academical discourses and theoretical froth have been allowed to proceed until, I daresay, the rooms of the Institute are now regarded by many as an appropriate place wherein to air spurts of eloquence, and to obtain cheap lessons in elocution, with the additional advantage of seeing it all in nice large type in the *Transactions*, and faithfully epitonised in the professional journals.

Fellows of the Institute, at times, delivered themselves of sound matter. I think, though, that if Mr. Dawson would consider the laws of moving water, or the conditions under which water in slow motion deposits matter in suspension, and with increased velocity removes it, he would alter his opinion as regards the diameters of house-drains, and would arrive at the conclusion that architects are in the habit of specifying diameters far too large for the purpose. Mr. William White, F.S.A., however, was positively amusing in the following narrative:—One evening, when the curtain in his sitting-room was unhooked, and he was suffering seriously from the gaslights, on getting up to the ceiling he was struck with the immense heat it to which he was putting his head.

Now, Sir, that is the sort of information we want. I daresay most of his hearers would look to the floor-line for the heat from gas-lights near the ceiling; but now we all know that it is not so. Thanks!

Who is responsible for all this waste of time? Is it the secretary, or the three stewards? One could have understood such things during the last *régime;* but when the well-known skill and accomplishments of the present secretary were imported, it was thought that his motto would be "Nous avons changé tout cela." But, during the discussion I have referred to, there he sat like a lamb, a *white* lamb in fact, and one could not help wishing that some gentle shepherd would, with his crook, give him the gentlest lift under the tail, so that he, or the President, or someone might *name* every man as he rose, and so close the discussion. Or, where was the librarian? He ought to have been at hand to say that Mr. Robins' paper, and all the discussion arising out of it, would be quite unnecessary, as there was nothing in any of it except on warming and ventilation, which is not to be found in S. Stevens Hellyer's book, "Dulce Domum."

The third paper on the "Remains of Roman Buildings at Brading, Isle of Wight," by Messrs. Price, was, so far, very interesting to architects, but more so to the antiquary. That, however, was balanced by the unique array of feminine beauty, which occupied "the front row of benches."

On the fourth paper on "Persian Architecture and Construction," by Mr. C. Purdon Clarke and Professor Lewis, I will not offer any comment. I repeat, however, for this occasion, my observation respecting the "front row of benches."

We have thus had four out of the six, or, at the outside, eight papers promised by the President, and what have we gathered? What could we have gathered? These are questions which I leave to be answered by those responsible for the papers, and will only add that if really practical and sound papers are not forthcoming, I do not see that the meetings need take place at all. Shut up the shop! If you cannot give us a good dinner, don't invite us, or the result will be that if you continue to give bad dinners, the invited will stay away, and then when there is a good meal there will be nobody to partake of it.

Let us have pure meat, and less soup and pudding; in fact, more of the sort of repast which Mr. Roger Smith's paper last night, and the discussion which followed, gave us.—I am, &c.,

Wm. Woodward.

THICKNESS OF ARCHES.

Sir,—In the last edition of the "Encyclopædia Britannica," art. "Bridges," Prof. Fleeming Jenkin, the writer of the article, quotes a well-known empirical formula for the thickness of the crowns of arches, with which he credits Mr. Trautwine as the originator, but on what authority he does not state. The formula in question, which is of the form $D = C\sqrt{r}$, was suggested by me, and adopted in my own practice as early as 1850, and communicated to the Building News, in which it appeared on the 27th Feb., 1857. I have some recollection of Mr. Trautwine and another gentleman claiming the formula in letters to the *Civil Engineers and Architects' Journal*, about the year 1861, neither of whom I believe claimed to have thought of it more than two years previously, I wrote to the *C. E. & A. Journal* on the subject at the time; but from some cause or another, my letter did not appear, and the matter dropped. Mr. Trautwine is the author of a very excellent "Engineer's Pocket Book," in which he gives a formula for the thickness of arches, but it differs much from that quoted by Prof. Jenkin.—I am, &c.

J. T. Hurst.

BUILDING STONES.

Sir,—Perhaps you will allow me to assure your correspondents on this subject in your last issue, that I did not—nor was it my object to—disparage granite or any other stone. I stated that a high specific gravity was no guarantee of the durability of a building stone, and I mentioned a proof which came to hand. I might have given many other proofs of my argument; one more will be sufficient now. At Wells Cathedral, the abaci of the caps of the columns were generally of dense blue-lias. This was all gone to decay, and had to be replaced at the recent restoration by other material, while the lighter oolite remains in perfect preservation.—I am, &c.

Charles Trask.

RE BOARD SCHOOLS—ORPINGTON COMPETITION.

Sir,—In October of last year the above School Board, through their clerk, Mr. Robert Gordon Mullen, advertised in your valuable journal for designs for additions and alterations to the

British Schools, Orpington, and also for the erection of a school house.

Can you, or any of the readers of the Building News, through this medium, inform the public, including the competitors, what has been done in this matter by the committee? One would have thought the Board would have acquainted the competitors the result of their labours.

The following is a copy of a letter accompanying the returned designs:—

Local Offices, Bromley, Kent, 19th January, 1881.

BOARD SCHOOLS, ORPINGTON, COMPETITION.

Sir,—The Board having made their selection, I return your designs herewith. Thanking you for competing,

I am, Sir, Yours faithfully,
(Signed) Robert Gordon Mullen.

Is it not reasonable that the competitors should know to whom the honour has fallen, and is it not usual to acquaint them?—I am, &c.,

One Interested.

SOCIETY OF MERCHANT VENTURERS' TRADE SCHOOL, BRISTOL.

Sir,—The inclosed letter will be interesting to many of your readers, as showing one of the worst results to the profession of the competition system.

This is the competition in which the Press was excluded from reviewing the designs.—We are, &c., Bevis and Hill.

Gloucester Chambers, Kings-road, Southsea, and at Fareham. March 1.

Merchants' Hall, 25th February, 1881.

S. M. V. TRADE SCHOOL COMPETITION.

Dear Sir,—I beg to advise you that I have this day returned to your address, carriage paid, the designs you sent in for the proposed new trade school.

I take the opportunity of informing you that, while the Society have offered to purchase for £100 the set of designs which they are advised is the best of those sent in, none of the designs are satisfactory, and no one of them will be carried out.

I am, dear Sir, yours faithfully,
(Signed) George H. Pope,
Treasurer, S. M. V.

Messrs. Bevis and Hill, Architects, Kings-road, Southsea.

WHOSE PLAN IS IT?

Sir,—In the Building News of to-day is published "a design for a concrete house for Mr. Lascelles, designed by Ernest Newton, architect." The *plan* given in the corner of the lithograph ought, however, to have been acknowledged as Mr. R. Norman Shaw's. See the Building News for May 31, 1872, page 448.—I am, &c., E. W. Godwin.

St. Stephen's Palace Chambers, Westminster, S.W., Feb. 25.

Other correspondents have written pointing out the same thing. We caused a communication to be made to Mr. Newton, who replied as follows:—"My explanation of the matter is very simple. Mr. W. H. Lascelles applied some time ago to Mr. Shaw to design him some houses to be built in concrete on his own method. Mr. Shaw being at the time very busy, handed the work over to me, at the same time giving me permission to use any of his drawings I might wish to use in giving Mr. Lascelles the sketches. This one that you published last week had a plan similar in nearly every respect to the house mentioned. The elevation was considerably varied, as far as I can recollect. When you proposed to publish it I asked and obtained Mr. Shaw's permission, he stipulating only that his name should not appear."—Ed.

THE LATE FIRE AT MESSRS. J. AND J. GREENWOOD'S.

Sir,—So much has been written and spoken of late in reference to the lack of good feeling and sympathy existing between employers and employed, that a noble exception cannot be too widely made known.

At the above fire all the joiners' tools were destroyed. As soon as the amount of each man's loss was ascertained, Messrs. J. and J. Greenwood presented to each uninsured workman seven shillings and sixpence in the pound; to each insured workman two shillings and sixpence in the pound, and made good the apprentices' loss in full.

As the generous sympathy thus displayed is unprecedented in the Building Trade, we hope its publicity will lead other employers to act as nobly when their workmen may be placed in like circumstances.—We are, &c.,

Employes of J. and J. Greenwood.

"FROZEN WATER SUPPLY AND KITCHEN-BOILER EXPLOSIONS."

Sir,—I am glad to see Mr. J. M. Gething, as an architect, taking an interest in this subject, and beg to thank him for his kind intention to enlighten us upon it. I fear, however, that he has been rather hasty in sending off his letter, and without understanding the real bearing of his remarks.

In regard to my diagram, Fig. 1, page 192, he says:—"There is very little, if any, use in Mr. Buchan's hot-water cylinder M." Now, it is a great mistake to say so, because, with a small boiler especially—as, *e.g.*, for a close range—and a strong fire, it is this hot cylinder, and not the hot-water cistern, that affords the safety; because the hot cistern may be emptied, and then, without the cylinder, the small boiler may be boiled dry, and become red-hot in a short time; and, if the cold water comes on again in these circumstances, an explosion takes place, and perhaps one or more persons are killed. I trust, therefore, that, with this explanation, Mr. Gething will both see and acknowledge his error promptly.

If Mr. Gething will look again at Fig. 1, p. 192, he will perceive that a complete warm circulation is maintained between the hot cistern B and the boiler N, by means of the down and up-pipes D and F. And so long as these are circulating properly and a fire on, there is no danger of the boiler-supply freezing, even although the branch pipes led off the up-cast pipe F were frozen. It is quite customary to make a "dead branch" of the hot pipe to the scullery sink, the length of which may perhaps be only 5ft., or it may be 20ft., even although provision is made to have hot water at once when a hot crane is opened at either a bath or basin, a small extra circulating pipe being put in to produce that effect, but as I showed no bath, &c., on page 192, I considered it unnecessary to complicate the drawing by showing said extra pipe, as it is not really necessary in connection with my subject on the solution of the problem on page 192, although said extra pipe, when put in, is an improvement. However, if it is wished, I am quite ready to supplement my drawing on page 192, but not to correct it. I leave the latter for Mr. Gething to do, if he is able, by a drawing of his own.

Although it sounds well in theory and at the first blush for Mr. Gething to say that if a cock is left trickling it should be a cold one, and not a hot one, because "waste of hot water means loss of heat"; he forgets that the warm-water from this hot-cock trickling slowly is utilised in preventing the waste-pipe from freezing, and also that as there may be an extra strong fire on during a severe frost, this trickling at the hot crane may be of use in preventing the hot-water from boiling, to prevent or stop which in some houses a large quantity of the hot-water has sometimes to be specially run off, particularly while cooking, so that all Mr. Gething's architectural objections to the plan, Fig. 1, page 192, are either mistakes or theoretical fancies, which won't stand a moment's practical criticism from a plumber who is acquainted with the subject.

I may add, in concluding, that I have the system shown in Fig. 1, page 192, in operation, and it worked well during the late severe frost in a large house which lately got a close range and small boiler put in, in place of the former open fire and large boiler. To the credit of the ironmonger, it should be mentioned that he refused to fit in the small boiler unless a circulating tank was put in, and when I was appealed to if the expense was necessary, I backed up the ironmonger, who was a stranger to me, for the reasons I have stated above as to the cistern being emptied.—I am, &c.

W. P. Buchan, S.E.

Glasgow, February 26th.

EXTERNAL SOIL-PIPES.

Sir,—Considering the very great acknowledged importance of a correct conclusion on this matter, it is a pity that Mr. Buchan gives merely reiterated statement and assertion, instead of explanation or reason why "the sewage-polluted air, blown off into the atmosphere from an inside soil-pipe, is several times greater in quantity, and also worse in quality, than the sewage-air from an outside soil-pipe." Mr. Buchan must have credit for seeing it, and believing it to be so; but he will be doing a much more substantial service to the cause of drain-ventilation and sanitary science, if he will in some way formulate his proposition in reference to the pace of current, quantity of air, and change of temperature in a given lengthened size of pipe. It is, I believe, generally admitted, but I am of course open to correction, that in a soil-pipe disconnected from the sewer, foul air will be generated only from one or both of two causes, namely, foul matter deposited in the pipe or drain, and stagnation of air. My proposition supposes the pipe, whether external or internal, to be sound and free from deposit; and I argue that the more rapid the draught up the pipe, the less danger of the generation of foul air. If this argument is unsound, I hope it will be shown wherein it is unsound, and not merely denied. Far be it from me to deny that Mr. Buchan is quite correct; but I do deny that he has supported his proposition by an valid arguments. True, he says that bad gas is given off by the greater heat. But, in order to make this practically applicable to the question, it is necessary for him to show how many degrees he finds the external temperature to be *raised* in its passage through an interior pipe, *more* than in an exterior pipe; and what would be amount of difference in temperature, and the length of time, necessary to induce the decomposition, which he alleges to take place; and, further, what would be the amount of increased evaporation taking place, which is said to make the increased draught up the soil-pipe more dangerous than the torpid state which he advocates.

Another point deserving of consideration is that the ventilation of an interior soil-pipe is much more likely to be regular and constant in its action, from the very fact of its more equable temperature, notwithstanding the changes which may take place outside; whilst an exterior pipe exposed to the heat of the summer's sun, and to the winter's frost, will unquestionably be liable to sudden and frequent changes in its action, in a manner most undesirable.

The question of outside or inside soil-pipes has been, and still is, very much controverted. Mr. Buchan's knowledge and experience may enable him to settle it to his own satisfaction in very few words. But a question of this sort is not so easily to be determined "off-hand," if it is to carry conviction to those who have grave doubts as to its solution, and who will not rest content with the mere *ipse dixit* even of a scientific man.—I am, &c.,

William White, F.S.A.

30A, Wimpole-street, 1st March, 1881.

Sir,—In a house I have recently altered, here, there are w.c.'s at the back and one in the front of the house.

The soil-pipe of the back w.c.'s I carried above the ridge of roof, because I wished this pipe to serve as the outlet for foul air. The top of the soil-pipe in the front I allowed to be considerably lower than the ridge of roof, because I intend this one for the admission of fresh air, and so to create a constant current in the soil-pipes and drain.

We know the effect of not carrying chimneys above the ridge of roof. But the position of the soil-pipe with regard to the roof does not appear to me to be often considered. The other day I saw one of Banner's cowls which was placed below the ridge, spinning about like a top, while one on the same house carried above the ridge was answering perfectly to the wind.

I may mention that the soil-pipe which I have used for the admission of fresh air is outside the house, and the other one inside.—I am, &c.,

Charles F. Moxon.

Beach Cliff, Westgate-on-Sea, Feb. 22.

ILLICIT COMMISSIONS.

Sir,—A company is now being started for the manufacture of bricks and tiles. To obtain shareholders, prospectuses are being issued to various individuals, and amongst others to architects.

A leaf, of bluish-grey colour, has been inclosed therewith, and sent, as I suppose, to professional gentlemen only; in it occurs this paragraph: "It is proposed to allow the profession, who are holders of ten shares and upwards, a discount of 10 per cent. on goods required through their agency."

As this would amount to from 1½ to 2½ per cent. on the cost of a building, and is the commission given for bricks and tiles only, the public may easily imagine how an architect can work for a client at 2½ or 3½ per cent., and yet be better paid than the more conscientious one, who will have at least 5 per cent. from his client; but, on the other hand, will accept no other commissions except those paid by the client.—I am, &c.,

Hugh McLachlan.

South Kensington, March 2.

The members of the court of the Founders' Company have awarded their freedom and livery, with a prize of ten guineas, to Mr. Hugh Stannus, A.R.I.B.A., of 118, Kennington Park-road, for his essay on "The History and Art of Foundry in Brass, Copper, and Bronze." The essays generally are reported to have given great satisfaction to the judges, and a second prize of five guineas has been awarded to Mr. Edward Tuck, of the Chauntry Works, Sheffield.

At the Carlisle Consistory Court, last week, plans were approved for the rebuilding of St. Nicholas parish-church, Whitehaven, on its present site, incorporating into the new and larger building some portions of the existing tower. The new church is to be built from plans by Mr. C. J. Ferguson, architect, of Carlisle, and will be seated for 1,000 people; the cost is estimated at £8,700, which will be met by a lady, as a memorial.

Intercommunication.

QUESTIONS.

[6414.] — **Trigonometry.** — Could some practical reader kindly recommend a good book on the application of trigonometry to land-surveying; also one of mathematical tables, the publishers, and price, and oblige?—Kanyaka.

[6415.] — **Centrolinead.**—Will any reader kindly inform me the way to use a centrolinead? I have a perspective to make of a house, and wish to be 200ft. away. The angles I intend using are 60° and 30°. What I wish to know is how to apply the centrolinead, and whether the vanishing-points are necessary to work it. I know the principles of perspective. If some one will kindly set me right I shall be much obliged.—One in a Fix.

[6416.]—**Value of Architect's Practice.**—Will someone inform me upon what basis the value of an old-established practice of an architect is ascertained?—A. T.

[6417.]—**Pebble Dashing.**—Could anyone inform me where the small pebbles, used for "pebble-dashing" the exterior walls of buildings, can be obtained, and the approximate cost of same per ton? Also, how many yards will a ton cover, and, if possible, to explain the *modus operandi* of "pebble-dashing" on a surface of Portland cement?—Lancashire.

[6418.]—**Smoke Cure.**—Houses are being built at foot of hill, and client fears smoke. He suggests carrying pipe from external wall to back of register, and about 3ft. up. Which is more probable, that pipe will act as exhaust of high-pressure engine, and drive smoke up flue, or that admission of air into flue will weaken draught at register? Client's idea is to prevent smoke at bottom of flue rather than at top. Suggestions will be welcome. If above pipe adopted, what size should it be? Flue, 14in. by 9in.—J. T.

[6419.]—**School-Boards and their Architects.**—Are school-boards obliged to employ a professional man to prepare requisite drawings and specifications, and superintend the erection of new schools; or does the department witness and sanction the employment of amateurs? I have a case now under my notice in which a novice has offered his services, and is preparing the above-named particulars.—H. W. L.

[6420.]—**Maintenance of Roadway.**—Will any experienced reader inform me whether there is any saving practically to the ratepayers in maintaining a public roadway from the fact that the central part is kept up by a tramway company, the sides only being made up from time to time as may be necessary by the parish. We were told that if the tramway were laid in our district that a saving would result to the ratepapers for the above reason. I questioned if there would be any saving, but should be glad of anyone will furnish a few facts from experience.—A Man in the Suburbs.

[6421.]—**Builder's Claim for Increased Depth in Foundations.**—A builder tenders for erection of a block of six cottages, plans and sections being given for only two, showing depth of foundation 2ft. 6in., but no instructions given on plans, sections, or in specification, that the ground sloped both laterally and longitudinally. Tender was accepted and work proceeded with, the foundations being brought up to the same level throughout, occasioning (owing to the falls of the ground) an average of 5ft., instead of 2ft. 6in. as tendered for. Can the builder claim for the increased excavation and brickwork? Surveyor lowered level of last two cottages in block, and increased thickness of wall of end gable separating fourth and fifth house. Can the builder claim this and for the verge pointing and flashing of roof, where it abuts against the wall of the adjoining house?—W. B.

[6422.]—**S. K. Exam.**—Would some of your able contributors kindly inform me what are the general questions put to students in the examination of architectural styles under the Department, and, also, what are the proper books to read up for the same!—Student.

REPLIES.

[6189.]—**Fifteenth-Century Dr. Tanners.**—Some little time ago (Aug. 13, 1880) passing allusion was made by me, in a reply to a query under the above heading, to a sculptured figure of a skeleton in Exeter Cathedral's choir, which some had ascribed as an effigy of Bishop Lacy. I expressed my firm conviction that this was an error, but I was not prepared at the time to say whom it did represent. I have just come across some information that seems to bear upon the figure in question in Richard Izacke's original edition of the "Antiquities of the City of Exeter," dated 1676. In page 93 it is recorded:—"In 1465 Bishop Courteney finished the north tower of his church" (*i.e.*, formed the Norman north-west tower of the original building into the north transept of the new Decorated one) "and freely bestowed the clock-bell therein bearing his Christian name, Peter, under which tower is an aisle. There purposely erected lies interred one William Sylke, some time sub-chaunter of this church, and reported to be the donor of the luminaries, or candle-lights yearly burnt in the quire of the said church between the feasts of Allhallowtide and Candlemas, an effigy of whose skeleton is there largely portrayed in white alabaster, under a fair arch, thus inscribed:—'Sum quod eris: fueramque quod es: pro me pro me precor ora.'" Mr. Sub-Chaunter Sylke's inscription does not seem to correspond with the existing inscription over the skeleton at the entrance to St. Andrew's Chapel in the north aisle of the choir, but otherwise the reference seems to fit in with him. The preface, if I may use the expression, on the title page of Izacke's "Antiquities," is delightfully pungent. It runs: "Books receive their doom according to the reader's capacity." The original MSS. of this work is still preserved amongst the city's records.—Harry Hems.

[6389.]—**Stained Wood.**—As a practical hand in such work, I would advise him not to attempt to get off dark stain by scraping or composition of any kind, as it would not only unfit the wood for any after-purpose, but cost endless labour in doing so. As he states "the church is too dark," I would suggest (and which is now much in vogue in all churches) to make a nice white distemper, with plenty of best ultramarine in same, and put this on open woodwork of ceiling. If this is properly done it will not only look sound and solid, but will add to the light of the church. I think if this was carried out correspondent would find he need not go to the expense of doing anything to the seats. Should he, however, still think the church too dark, and would like the seats altered in appearance, I would advise a nice drab in two party colours; but this also should be done by one well experienced in the making and using of colours; although looking simple enough to paint, it requires great care in the proper mixing of fitting material, and the working of same for such like furniture. I should be pleased to give correspondent any further information, or would carry out the said work myself for him should he think fit to advertise his address and requirements.—Church Decorator.

[6394.]—**Entasis of Greek Column.**—I should advise the axis, height, and upper and lower diameters of column, to be set out full size on a floor of good working area. From bottom of column or shaft draw a line indefinitely perpendicular to the axis of column, and from the extreme point of the upper diameter as centre, with radius equal to the lower semi-diameter, strike an arc cutting the exis in a point. Through the latter and extreme point of upper diameter then draw an oblique line, cutting the horizontal line produced, and this intersection will give the centre of any convenient number of ordinates or rays, which may be drawn through axis of column. Upon these several rays the semi-diameter of the bottom of column is set off from the axis, and the points so found will be in the curve required, which may be drawn either with a straight or flexible ruler. There is a sort of trammel that may be used for the same purpose.—G. H. G.

[6398.]—**Workhouse Plans.**—I do not think "Fair-play" has a claim legally, inasmuch as the guardians said nothing in advertisement about compliance with the requirements of the Local Government Board. The case is certainly a flagrant one, and the guardians deserve exposure for selecting a plan which has been so altered by the Local Government Board as to be scarcely recognised again, and in rejecting one which appears to have come so near to the requirements of the Board. If the particulars furnished to the competitors gave them to understand that the approval of the Board was necessary, there might possibly be a case against the guardians, which would, however, be hardly worth trying.—G. H. G.

[6402.]—**Quantity of Stone in Spire.**—"Novice" would probably have but an imperfect idea of what to allow for waste in the angle stones and plain ashlar of spire, and had better leave it to intending contractors to make their own allowance, with a statement to that effect in the bill. The margin to be allowed for waste will vary very much, according to the kind of stone used. If in Bath stone or other soft oolite, the angle stones would be sawn one out of the other, and the ashlar would be cut to the rake, whereas in the North of England or other grit-stone locality, a square stone large enough to make each separate angle stone would have to be provided for, for even if moulds were sent to quarries to have stones roughly scappled to shape, to save carriage, the square stone would be charged for. Moreover, I should not give it in cube feet at all, but give the number of superficial feet measured over all, taking each thickness as a separate item, as 8in., 6in., and 4in., and giving the height of each from ground for hoisting, then state, "To extra stone and labour, to angle of spire," in lin. feet, and for the solid portion at top measure the courses separately as square stones, also noting this in the bill. As a practical mason, I should take it in this way.—S. B. B.

[6403.]—**Builders' Accounts.**—It is far more satisfactory to bill extras and deductions in full.—F.

[6403.]—**Builders' Accounts.**—The 20 yards only is an extra, the 70 yards being in contract, and not needing to be considered. There is no deduction, and therefore the seventy yards cannot appear in that column, and there cannot be any reason for so doing, except that the surveyor is to be paid by percentage on the extras and deductions.—S. B. B.

[6406.]—**Felting a Roof.**—Yes.—F.

[6407.]—**Cubing a Building.**—Take from the bottom of the footings to half-way up the roof.—F.

[6407.]—**Cubing a Building.**—The whole of the buildings from bottom of foundation to, say, half-way up roofs, should be measured. Also all dormers, bays, and projections. Solids, such as chimney stacks, should be estimated separately.—B.

[6409.]—**Milled Lead.**—Most certainly, 4½lb. lead cannot honestly be substituted for 5lb. It is not any way to the point to say that it would do as well. The plumber pays for his lead by weight, and also charges for it by weight. Half a pound gained in each super foot is a matter too serious to overlook. Let the contractor see that you are not to be taken in in this case, and you will escape imposition at his hands for the future.—B.

[6409.]—**Milled Lead.**—4½lb. lead is manufactured purposely. If 5lb. lead is specified, "see that you get it."—F.

[6410.]—**Clerk of Works.**—Neither; the accounts should be prepared by a competent surveyor.—F.

[6412.]—**Charges for Abandoned Plans.**—Charge a nominal amount sufficient to cover time, office expenses, &c.—F.

[6413.]—**Green Slates.**—Nantle Vale.—P.

A select committee of the House of Commons, on Tuesday morning, passed the preambles of two Bills promoted by the Metropolitan Railway Company, the principal one being one to enable the company to make an immediate extension of their system from Aldgate to Tower-hill, as an instalment of the completion of the Inner Circle Railway; the other Bill is to authorise them to make agreements with the Corporation of London and other bodies, for the purpose of completing the City extensions.

LEGAL INTELLIGENCE.

Modern Housebuilding.—At the Edmonton Petty Sessions on Friday, R. Radley, builder, of 2, Newton-road, Page-green, Tottenham, was charged upon five summonses with violating the by-law of the Tottenham Local Board of Health which provides that "the external and party or side walls of every new building constructed of brick, stone, or other hard substances shall be efficiently and solidly bonded and put together with mortar or cement, and the bricks, stone, and timber used in every new building shall be substantial and sufficient; and for the purpose of securing stability to new buildings, the mortar, cement, bricks, and timber used, or intended to be used therein, shall be subject to the approval of the Local Board." Mr. W. A. H. de Pape, surveyor to the Board, deposed that in September, 1879, the defendant deposited plans for the erection of five houses in Newton-road. The plans were approved, subject to compliance with the by-laws. Witness visited the buildings on the 17th ult., and found a very improper substance being used as mortar. It was composed of screened lime from old buildings, mould, and a very small portion of lime. Samples were placed before the magistrates and carefully examined by them. The material fell into pieces upon being slightly pressed between the fingers. Mr. de Pape said the principal ingredient was ordinary mould. That same stuff had been used in all the five houses. The plaster upon the walls was composed of mould and screened rubbish from old buildings. The party and internal walls had been constructed nearly altogether of brickbats, but the facing was good. Walls so constructed were not safe. In some of these houses the party-walls were in a dangerous state. Proper timbers had not been used in the construction of the houses. The floor joists were bad; most of them were of old timber which ought not to have been used, but some of them might have passed if the workmanship had been at all decent. The houses were finished, but were not safe for human habitation, and ought to be pulled down. The matter would be reported to the board at their next meeting, and no doubt directions respecting the houses would be given. Mr. Abbiss said the infliction of a fine, even to the full amount allowed by law, did not meet the justice of such cases. Here were houses which would be positively dangerous for people to live in, and he thought the board ought to exercise what power they possessed in order to have the buildings pulled down. He had never seen such wretched samples of so-called mortar in his life. Did the defendant have notice not to use it? Mr. de Pape replied that notice not to use the materials in respect of two of the houses was sent to the defendant on the 28th of December, but he went on. Mr. Abbiss said the bench were determined to do all in their power to put a stop to this nefarious style of building, and required the defendant to pay the full penalty of £5 for each house, and a continuing penalty of 10s. per day for forty-four days in respect of the two concerning which notice had been given. The defendant was also ordered to pay 40s. for neglecting to carry a party wall of a new building to the required height under the by-law of the board devised for the prevention of fires. The total fines and costs amounted to £75 11s. 6d., and the bench ordered a month's imprisonment upon each summons in default of the money being paid or recovered upon distraint.

Back Money for Brickmaking.—Street v. Hudson and Baker.—In this case, heard at Bow County Court on Saturday, the plaintiff, Simon Street, a brickmoulder, of Barking-road, sought to recover from defendants the sum of £11 13s., being money retained by defendants on 466,000 bricks made by plaintiff for them. Defendants pleaded justification for retention, and set up a counter claim of £50 for bricks alleged to have been spoiled in making by the plaintiff. Mr. Willis, in opening the plaintiff's case, said his client was engaged for the brick season by the defendants to manufacture bricks, for which he was to be paid 5s. 6d. per 1,000, of which 6d. per 1,000 was to be retained by defendants till the end of the season, when they were to pay it over to plaintiff, providing he had not misconducted himself so as to warrant his being discharged. Should he, however, be discharged for any proper cause, the employers claimed the right to retain the money. Plaintiff remained in their service till September 3rd, when he was discharged on the ground that he had been idle all the previous week. It was then nearly the end of the season, and plaintiff and his gang had made 466,000 bricks. He applied for the back money on this number, but the defendants refused to pay it. The defence was that plaintiff did his work so badly that 50,000 bricks were entirely spoiled, and defendants submitted that under these circumstances they were entitled not only to keep the back money but also to be paid for the loss. The jury returned a verdict for the defendants, but disallowed their counter-claim.

Libel on a Lincoln Architect.—Last week a Sheriff's Court was held in the Castle of Lincoln,

before Mr. A. B. Burton, Acting Under-Sheriff, and a jury, to assess damages in an action for libel, in which Mr. Wm. Watkins, of the firm of Messrs. Watkins and Scorer, architects, of Lincoln, was the plaintiff, and Mr. Wm. Reeve, plumber, also of Lincoln, was the defendant.—The action was founded on a letter which the defendant had caused to be sent to the Rev. C. C. Ellison, Vicar of Bracebridge, Chairman of the Lincoln Board of Guardians, and Chairman of the Bracebridge Schools. This letter was sent to Mr. Ellison on the 2nd August last, and was signed "Miles's Boy." The letter ran as follows:—"Lincoln, 2nd August, 1880. Sir,—The architect who has done the Dispensary and Union in excessive charges for quantities of lythography has also done the Bracebridge School Board and yourself by charging 2½ per cent. for quantities of ten times the cost of lythography, the latter being done by the boy in his office; and he has charged you £10 for lythography."—Mr. Ellison at once forwarded the letter to Mr. Watkins, who had been the architect engaged in the erection of the Lincoln Dispensary, and also for the enlargement of the Lincoln Union Workhouse and the erection of the schools for the Bracebridge School Board, and was likewise employed personally by Mr. Ellison. Mr. Watkins succeeded in ascertaining that the letter in question had been written by Orlando Keyworth, a clerk in the office of Mr. Dale, solicitor, Lincoln, at the request of the defendant. The latter gave to Keyworth a letter to copy, and Keyworth stated that this letter was in the handwriting of Mr. Goddard, also an architect in Lincoln, and the defendant told Keyworth "he might guess again and be wrong." Proceedings were at once initiated, a writ being served upon the defendant; but he took no action to defend himself in the matter, and no communication was received from either him or his solicitors until the 12th of the present month, when a writ of inquiry had been issued.—The jury found for the plaintiff, damages £10.

The Midland Land and Investment Corporation (Limited) v. Peto.—This case was originally brought on at the last Warwick Assizes, and was further heard last week before Mr. Justice Denman, at Westminster. The action, it will be remembered, was brought to recover a sum of upwards of £14,000, alleged to have been paid to the defendant by the plaintiffs by mistake on behalf of one Godbold in respect of certain buildings erected by the defendant for the said Godbold in Chancery-lane.—His Lordship delivered judgment on Saturday last. After reciting the facts of the case at considerable length, the Judge held that there had been no such mistake as alleged, and that the sums paid to the defendant had been paid on the certificates of the architects after they had been duly checked on behalf of the plaintiffs. Judgment for the defendant, with costs.

District Surveyors' Fees—An Explanation Wanted.—At the Mansion House on Wednesday, Messrs. Trollope and Sons, builders, attended before Alderman Lusk, upon an adjourned summons, at the instance of Mr. Collins, the Board of Works district surveyor for the eastern portion of the City, for having, as builders of premises at Nos. 27 and 28, Nicholas-lane, neglected to give notice to him within two days of the commencement of the work, in accordance with the 38th section of the 18th and 19th Vic., c. 22. Messrs. Trollope's explanation was that, thinking the premises in question were in the southern division of the City, they gave the requisite notice and paid the legal fees to Mr. Power, the surveyor of that district, who had inspected the buildings and certified that all was correct. The premises, however, were shown to be in Mr. Collins's district. On Wednesday, Mr. Collins said that since the last hearing Mr Power had paid over to him the whole of the fees, and had handed in the notice given him by Messrs. Trollope, and in these circumstances he asked that that summons might be withdrawn. Sir Andrew Lusk, seeing that on the last occasion he made some strong observations as to Mr. Power's conduct in taking the fees for a matter in another surveyor's district, and in thus causing the summons against Messrs. Trollope to be issued, asked whether he was present to offer any explanation. Mr. Collins said he was not. Mr. Wontner, solicitor for the defence, said Mr. Power was summoned to attend as a witness on the last and on that occasion, but he had thought fit to set the Court at defiance. If such behaviour were tolerated, there would be an end to the transaction of business. Sir Andrew Lusk said if an application were made to him to compel Mr. Power to attend, he should issue that process directly. Mr. Wontner said no doubt Mr. Power's conduct would be brought before the Metropolitan Board of Works, and that would suffice. The summons against Messrs. Trollope was then withdrawn.

A handsome brass eagle lectern has just been placed in St. Mark's Church, Reigate. We understand it is from the workshops of Jones and Willis, London and Birmingham.

WATER SUPPLY AND SANITARY MATTERS.

Norland Waterworks.—The water supply of this village having been contaminated for some time back, a public inquiry was held, and the plans and sections of a scheme submitted by Mr. T. L. Patchett, Halifax, approved. The works, recently completed at a cost of £455, consist of a covered ventilated impounding reservoir, constructed on the edge of the moor, adjacent to the noted "boiling" springs, which have also been covered in and connected to the reservoir. Four inch cast-iron piping is carried across the moor, and along the road to the village as far as the "Blue Ball Inn," a distance of 1,192 lineal yards, and then continued forward, by 3in. piping, to the lower extremity of the district. A loop line of main supply pipes is also carried for a distance of 543 lineal yards round by the church. Public wells are put down at convenient places, as well as branches from the main arranged to the various properties, and provision made for fixing hose and jet.

STAINED GLASS.

Horton in Ribblesdale.—A large three-light stained-glass east window, in the antique, clear, pure, and effective York-minster-glass style, has just been erected in this church to the memory of the late John Wm. Foster, Esq. The subjects are respectively the Nativity, Crucifixion, and Ascension. In the first, an angel bears the legend "Gloria in altissimis Deo." The artists are the Messrs. Powell, Bros., of Leeds.

Haworth, Yorks.—This church has been further engifted with a stained-glass four-light or memorial window, situated at the east end of the south aisle. Of the subjects chosen, each illustrates a prominent event in the lives of the respective chief apostles of the Jews and Gentiles, SS. Peter and Paul. The first two lights represent St. Peter, accompanied by St. John, healing the lame man at the Beautiful Gate of the Temple, to the marvel of the beholders. The groups of the last two lights pourtray St. Paul preaching at Athens. The tracery lights, having special regard to the dedication of the church, present figures of St. Michael and Angels. The whole is richly toned and ornamented. The window is by the art firm of Powell Bros., Leeds.

CHIPS.

The church of St. Michael, New Quay, Cornwall, built a few years since from the designs of Mr. William White, is about to be enlarged from that architect's designs.

The memorial-stone of a new infirmary, now being added to the workhouse of Mile End Old Town, was laid on Tuesday week. Mr. J. M. Knight is the architect, and Messrs. W. and F. Croaker are the builders, their tender at £32,300 having been selected as the lowest of 16 received. The building will accommodate 400 patients.

At the Middlesex quarter sessions on Thursday week, Mr. F. H. Pownall, the surveyor of county bridges, was appointed county surveyor, under the Highways and Locomotives Amendment Act, 1878, at an inclusive salary of £400 per annum.

A memorial stained-glass window has just been placed in the Grammar-school at Monmouth. The subjects are taken from the Beatitudes, and the work has been executed by Messrs. Ward and Hughes, of Frith-street, Soho, London.

A new Congregational Church is about to be built at Elland, near Halifax, from the plans of Mr. Kirk, architect, Huddersfield.

A drinking-fountain is about to be placed on the Hoe, Plymouth, as a memorial. The plans are being prepared by Messrs. Hine and Odgers, of that town.

The Elm Park Estate, Finchley (formerly known as "Elm Place"), is to be sold by auction, in building plots, for the erection of villa and other residences. This freehold estate is one of the finest in the north of London. Messrs. E. E. Croucher and Co., of Chancery-lane and Seven Sisters-road, are the auctioneers.

A new permanent church of St. Paul is being erected in Ferndale-road, Brixton, from the designs of Messrs. Habershon and Fawckner, and will be opened in May next. The organ is being built by Messrs. Lewis and Co., of Shepherd's-bush.

A new meeting-hall is in course of erection in connection with the Established Church at Kingskettle, N.B. The building is Gothic in style, measures 40ft. by 21ft., and is constructed of local freestone. Mr. Storrar, of Cupar, is the architect; Messrs. T. and M. Berwick, of Kettlebridge, have taken the contract for masonry, and Mr. Sellars, of Kingskettle, that for joinery.

Our Office Table.

Thanks alike to our readers and advertisers, we have this week been able to add another eight pages to the Building News, which will henceforth consist of 48 pages of letterpress, and six or more pages of illustrations. The enlargement will remove, for a time at least, the inconvenience we have laboured under for some time, arising from the growing demands upon our space; should it recur, and readers and advertisers once again combine to exert the gentle (and by no means objectionable) pressure we have just yielded to, we shall be quite ready for another enlargement.

A recent advertisement for a surveyor and inspector of nuisances for the Swindon Local Board district, at a salary of £90 per annum, brought nearly eighty applications for the office. Only three of these were from local men, the others residing in the following towns:—Ramsgate, Edinburgh, Sheffield, Manchester, Bognor, Southsea, London (4), Birmingham (2), Taunton, Rochdale, Oxford, Stratford-on-Avon, Burton-on-Trent (2), Southwark, Malton, Horncastle, Hull, Norwich, Camden Town, Derby, Cirencester, Stafford, Bedford, Walthamstow (2), Holbeach, Gateshead, Liverpool, Huddersfield, Croydon, Newnham, Bristol (2), Liddington, Lower Clapton, Hereford, Bolton, Buxton, Lowestoft, Carlisle, Nottingham, Darlington, Bradford (3), Shipley, Glasgow, Whitby, Manchester, Yarmouth, Alton, Leeds, Llandudno (2), Stranraer, Middlesbrough, Tunbridge Wells and Leek. A special meeting to consider these applications was held in the board-room on Tuesday week. Some of the applications raised a laugh. One applicant for this £90 a year remarked that he understood the board would require some security, but "as he was possessed of property worth at least £18,000, it would be clear this could be easily be arranged"! One very handsome builder in the North, in business on his own account, sent his photograph as a recommendation. Another directed his envelope so badly that it passed through, and bore the stamp of, no less than nineteen post offices before it arrived at its proper destination. After an examination lasting upwards of four hours, four gentlemen, from Lowestoft, Walthamstow, Bolton, and Hereford, were selected for a personal interview with the Board.

It is stated that Sir William Harcourt's London Water Bill avoids his predecessor's gross blunder of embodying the terms for purchasing the varied interests of our seven or eight companies. The bargain, if any be attempted, will be left to the new Water Trust or other power now hatching, or perhaps by this time duly hatched, for official incubation has not been neglected, say rather steadily advanced, by Parliamentary obstruction. The Water Trust contemplated by the report of Sir William Harcourt's Committee was designed to have the choice of regulating the supply as in the hands of the companies, to introduce a competing supply, or to buy up existing interests—these alternatives to be exercised separately or in any chosen combination.

The 14th annual general meeting of the Builders' Clerks' Benevolent Institution was held at the offices, 27, Farringdon-street, E.C., on Tuesday, Feb. 22, Mr. Stanley G. Bird (the new president) in the chair. The report showed that the income for the past year was £510 2s. 2d., of which sum £375 1s. 9d. belonged to the Relief Fund, and £155 0s. 5d. to the Orphan Fund. During the year an addition of £300 stock had been made to the invested funds. A public dinner was held on the 6th April last, under the able presidentship of Mr. Taprell Holland, the sum of £269 16s. being the result of his earnest appeal on the occasion. This success enabled the committee to add a new pensioner to the list, and a vacancy occurring at the same time through the resignation of Mrs. King, an election was held, when Mrs. S. A. Coulson, and Mrs. M. A. Olver (the only eligible candidates), were both elected by show of hands, being thus spared the expense and anxiety of a contest. The total number of pensioners now on the funds is 10, besides two children being maintained and educated in connection with the Orphan Fund.

It has been asserted that the First Commissioner of Works is likely to bring in a

Bill to remove the Temple Bar Memorial. The report is we believe unfounded, and probably springs out of the fact, mentioned by us a fortnight since, that next session, when the question of the government of London comes forward in the shape of a Cabinet measure, it is likely that provisions will be introduced which will give the First Commissioner of Works the same power in the streets of the City of London that he has in the streets of the metropolis outside London, by which he can forbid the erection of any memorial or building of any sort in a public thoroughfare, and his acquiescence is necessary to any such erection.

ON Tuesday evening a lecture on "Ideals in Christian Art" was delivered in the hall of the Liverpool Free Library by Mr. C. T. Gatty, F.S.A., curator of the Mayer Museum. Mr. Gatty exhibited, by means of the oxy-hydrogen light, a number of drawings from ancient and modern works of art, carvings, paintings, sculpture, and illuminations included within the Christian era, with a view to demonstrate that up to the fifteenth century there was always an unmistakable air of the supernatural about the productions of artists, and that from that time to the present day the tendency had been to represent the simply human element to the exclusion of the religious ideal. In support of his theory, the illustrations were exhibited in a series of constrasts. As an instance may be mentioned the Great Seal of England in the reign of Edward II., in which the king is represented as the rigid, upright, thoughtful, ideal Christian king, with a dove perched upon the top of his sceptre and a cross upon the globe. On the other hand was the Great Seal in the reign of George IV., without the dove and the cross, the monarch depicted in an attitude of ease, surrounded by luxury and supported by the presence of Hercules and Minerva.

Harper's Magazine for this month has an interesting article by Mr. Moncure D. Conway, on Bedford Park, with some illustrations, comprising —A View from a Balcony—Tower-house and Lawn-tennis Grounds—Dining-room in Tower-house — Queen Anne Gardens — Co-operative Stores and Tabard Inn—Reading and Billiard-room, Club-house—A Fancy-dress Party at the Club—and An Artist's Studio. Mr. Moncure D. Conway says that his "summer ramble ended in a conviction that Bedford Park was an adequate answer to Mr. Mallock's question, 'Is Life Worth Living?'" If lived at Bedford Park, Mr. Moncure D. Conway says, "decidedly yes."

IN one of his "Latter-day Pamphlets" Mr. Carlyle expressed himself strongly on the subject of statues. After observing that the first question to be decided by "a company of persons who have decided to set up a brazen image" was whether the hero's memory is worthy a statue, Mr. Carlyle said the next question to be decided was whether the statue would be worthy the hero—"Is it so excellent in point of art as to be a respectable approach to the Ideal? Or alas, is it not such an amorphous brazen sooterkin, bred of prurient heat and darkness, as falls, if well seen into, far below the Real? Can you, my misguided friends, think it humane to set up in its present uncomfortable form this blotch of mismolten copper and zinc, out of which good warming-pans might be made? Cannot the Woods and Forests, in the name of sense and common decency, interfere at least thus far? Namely, to admonish the misguided citizens, subscribers to the next Brazen Monster of sad sculptural solecism, and exhort them three successive times to make warming-pans of it and repent; or failing that, finding them obstinate, to say with authority, 'Well, then, persist. Set up your Brazen Calf, ye misguided citizens, and worship it, you, since you will and can. But observe, let it be done in secret, not in public; we say in secret at your peril! Observe therefore. Build a high enough brick case, or joss-house for your Brazen Calf, with undiaphanous walls and lighted by sky windows only; put your Monster into that and keep him there. Thither go at your pleasure and worship your bellyful; ruin your own souls only, and leave the poor population alone; the poor speechless unconscious population whom we are bound to protect, and will!'" And now some people in Chelsea are proposing to erect a statue of Carlyle himself on the Chelsea Embankment!

WE are informed on good authority that an influential committee has been formed of London and Provincial builders, and several meetings have been held, with the object of forming a company for the building and auxiliary trades, on strictly mutual principles, which shall enable employers to insure against accidents happening to their workmen. We are given to understand that in a few days the project will be laid before the trade.

A REPORT on the works executed by the City of London Commissioners of Sewers during 1880 has just been presented to that body by Mr. Wm. Haywood, their engineer and surveyor. It is stated that during the year Monument-yard was rendered available for carriage-traffic, and a new street opened on the east side into Pudding-lane. The entrance to Lime-street-square has been widened from 11ft. to 20ft. wide — an important addition to a series of improvements carried out during the last few years in that locality. Many other street improvements have been carried forward a stage, and arrangements have been made for setting back houses in Basinghall-street, Fetter-lane, Warwick-lane, Fore-street, Jewry-street, &c. Among other contemplated improvements, as to which freeholds have been bought or negotiations entered into are those for continuing the widening of the south side of Ludgate-hill, for widening Fleet-street on north side between the Courts of Justice and Chancery-lane, Ave Maria-lane on the south side, and Upper Thames-street. A variety of pavements were laid in the carriageways, including the Val de Travers compressed, Limmer compressed, and the Société Française asphaltes, the improved and Ligno-Mineral wood pavings, and some granite work. On the footways the three kinds of asphalte already mentioned were laid, and also York dressed stone. In a length of 50ft. of footway, on the south side of Leadenhall-street, there have been laid, as an experimental comparison, three parallel strips of (1) granolithic pavement—formed of crushed granite mixed with lime and cement, and formed into slabs—(2) Maninghen stone, a calcareous sandstone with fine close grain, from the Maninghen quarries near Boulogne, and laid in courses 2ft. wide and 2½in. thick, and (3) York flagging of ordinary description. In April next it is intended to commence the lighting of three districts of the City with electric light, under the Brush, Jablochkoff, and Siemens, Brothers' systems; the experiment would be continued for twelve months. An experiment is being tried in a district between Fenchurch, Aldgate, and Lower Thames-streets of washing the streets by jet and hose.

IT is generally believed that Portland cement is impervious to gas as well as moisture, but its capabilities have been a little exaggerated. Mr. Philbrick, in an article on house-drainage, in the Massachusetts State Board of Health report, alludes to a drain, well laid, with full cement joints, and covered with concrete of hydraulic cement, which, notwithstanding, gave off through this cement a sufficient effluvium to make the cellar nauseous, even though the soil-pipe was ventilated. Dr. Russell, lecturer on sanitation at the Watt Institute, Edinburgh, tested the efficacy of Portland cement by having a cylinder made, 2in. long, composed of two parts of sand and one part of cement, bedded in a glass funnel, and coated with paraffin, with the top of the funnel dipping in mercury, within an air-tight vessel. An aspiratory force, equal to 1in. of mercury, brought air through it slowly, while a suction, equal to 7in., gave a tolerably rapid succession of bubbles. These experiments are conclusive, and show there is a tendency among builders and others to overrate the impervious qualities of cement.

CHIPS.

The corner-stone of a Moravian Sunday-school was laid last week at Wyke, near Halifax. The building is to be of one story, 46ft. by 27ft., and will be divided by a wooden partition into boys' and girls' departments. It will accommodate 300 scholars, and will cost £1,000. Messrs. G. Hepworth and Sons, of Brighouse, are the architects.

The church of St. Margaret, Halstead, Kent, was consecrated by the Archbishop of Canterbury on Wednesday week. The old parish-church has been pulled down, and the one just consecrated consists of a nave, aisle, south porch, vestry, and organ-chamber, added to the cemetery chapel, which has been altered into a chancel. The style is 13th century, and accommodation is provided for 350 persons. The arcade-columns are of green sandstone, and the arches themselves of moulded brickwork; the floors are of encaustic tiles, and the open seating is of deal. Mr. W. Milford Teulon, of London, was the architect; Mr. Williams, of Harrington-square, London, the contractor, and Mr. J. Miles Griffin executed the carving. The cost has exceeded £4,000.

The Camborne Waterworks Company have accepted the tender of Mr. W. H. Thomas to enlarge their reservoir to a capacity of six million gallons, at a cost of £477.

At a meeting of the Essex Church Building Society, the following grants have been made:—Clacton-on-Sea, £25; Chadwell-heath new church, £50; Forest-gate iron church, £15; Pittlewell, £20; and Steeple new church, £60.

New schools and a teacher's residence are about to be erected for the united district school board of St. George and St. Bride-super-Ely, near Cardiff, at St. George's, from the plans and designs of Messrs. Blessley and Vaughan, of Cardiff.

At a special parochial meeting, held at Kirkintilloch on Saturday, Mr. Kinnear was appointed architect for the new manse, the cost not to exceed £1,500.

The parish-church of Almondsbury, Bristol, has been effectively lit up by means of the new Hesperus oil-lamp, manufactured by Jones and Willis, of Birmingham and London.

St. Andrew's Church, Droitwich, is now reopened after some considerable alterations, including a new set of choir stalls, by Jones and Willis, of Birmingham.

A new Catholic Church of St. Patrick is in course of erection in the London-road, Nottingham, from the plans and under the direction of Messrs. Evans and Jolley. The contract for the first two sections has been taken by Messrs. Vickers and Co. at £1,168, and at a meeting held on Sunday week it was decided to proceed with a further section at an estimated additional cost of £768, by which the permanent structure will be carried throughout the nave and its aisles to the roof-plate level.

It has been determined to restore the parish-church of St. Andrew, Bishop Auckland, at an estimated expense of £3,000. Mr. A. W. Blomfield, M.A., is the architect.

A gold medal has been presented to Mr. William Wagstaff, builder, of Preston, near Ipswich, as a testimonial to the manner in which he built the new Wesleyan chapel in the village of Chelmondiston.

On Friday week a meeting was held in a drill hall on the occasion of the presentation of a testimonial to Mr. S. Brownfield, superintendent of the Surrey Commercial Docks, by the *employés* of that large company. The testimonial consisted of a silver tea and coffee service and salver, and there was the large number of 861 subscribers.

The annual meeting of the Bradford Antiquarian Society was held last week, when a report was read, showing that the Society is in a satisfactory condition, and that ten members had been added during the year. Mr. S. T. Empsal was re-elected president.

Throat Irritation.—Soreness and dryness, tickling and irritation, inducing cough and affecting the voice. For these symptoms use Epps's Glycerine Jujubes. Glycerine, in these agreeable confections, being in proximity to the glands at the moment they are excited by the act of sucking, becomes actively healing. Sold only in boxes, 7½d. and 1s. 1½d., labelled "JAMES EPPS and Co., Homœopathic Chemists, London." A letter received: "Gentlemen,—It may, perhaps, interest you to know that, after an extended trial, I have found your Glycerine Jujubes of considerable benefit (with or without medical treatment) in almost all forms of throat disease. They soften and clear the voice. In no case can they do any harm.—Yours faithfully, GORDON HOLMES, L.R.C.P.E., Senior Physician to the Municipal Throat and Ear Infirmary."

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—London Institution. "The Gods of Canaan." By Prof. A. H. Sayce. 5 p.m.
Society of Engineers. 7.30 p.m.
Society of Arts. "The Scientific Principles Involved in Electric Lighting." By Prof. W. G. Adams, F.R.S. First lecture of course. 8 p.m.

TUESDAY. Institution of Civil Engineers. Discussion on "Tide Gauge, Tidal Harmonic Analyser, and Tide Predictor." 8 p.m

WEDNESDAY.—Society of Arts (in theatre of South Kensington Museum). "Ascents of Chimborazo and Catopaxi in 1880." By Edward Whymper. 8 p.m.

THURSDAY.—Society for the Fine Arts. "Art with Reference to the Stage." By W. J. Allen. 8 p.m.
London Institution. "The Prospects of Architecture in Modern Civilisation." By Wm. Morris. 7 p.m.

FRIDAY.—University College. "The Sculptures of the Temple of Zeus, at Olympia." By Prof. C. T. Newton. 4 p.m.

Lamplough's Pyretic Saline is refreshing most agreeable, and the preventive of FEVERS, BILIOUSNESS, SMALL POX, SKIN DISEASES, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill. *Use no substitute.*—[ADVT.]

Holloway's Pills purify the blood, and by this operation prevent the depressing effects of cold, damp, and foggy weather. They rouse the nervous system to a healthy standard, and give a wholesome tone to every organ of the body. Holloway's Pills present the surest means of checking all chest complaints.

CINDER-SIFTING ASH CLOSETS

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Norton-sub-Hamdon, Ilminster, Somerset.

—[ADVT.]

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General Repairs and Alterations Executed. Experienced Workmen always in readiness, and sent to any part of the country.—[ADVT.]

BATH STONE.

SUMMER DRIED,

CORSHAM DOWN,

100,000 Feet Cube.

PICTOR & SONS, BOX, WILTS.

[ADVT.]

TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender—it adds to the value of the information.

BEXHILL.—For road-making, Bexhill-on-Sea, for Earl De la Warr. Messrs. Fowler and Hill, surveyors:—

Cruttenden, F., St. Leonards ...	£788 0 0
King, A., Hollington...	550 0 0
Bull, E., Hollington	533 0 0

BROCKLEY.—For construction of a sewer on an estate at Brockley, near Lewisham. Mr. Henry S. Legg, of Christ's Hospital, engineer:—

Carter, W.	£2,500 0 0
Woodham, W. and J.	1,965 0 0
Keeble, J. W.	1,619 0 0
Bell, J.	1,599 0 0
Kirk and Randall	1,390 0 0
Webb, J. W....	1,375 0 0
McKenzie and Co.	1,243 0 0

BLACKHEATH.—For alterations and additions to No. 8, The Paragon, Blackheath. Mr. Geo. Legg, architect. No competition:—

Shurmur (accepted).

COTHERSTONE, YORKS.—For works to St. Cuthbert's Church. Mr. C. Purdon Clarke, architect, Sheffield-terrace, Campden Hill, London, W.:—

Kyle, J., Barnard Castle (accepted) £1,290 0 0

COVENTRY.—For the erection of a stone wall in Brick-kiln-lane, for the Coventry Board of Guardians. Mr. T. W. Whitley, surveyor:—

Mellor and Dyer, Kenilworth ...	£84 10 0
Lockley, S.	39 18 6
Newman, W.	38 0 0
Price, Thos.	32 0 0
Coulson, T.	30 10 0
Taylor, W.	28 0 0
Garlic, C., Coventry (accepted) ...	28 0 0
Green, S.	26 0 0

CRICKLEWOOD.—For the construction of roads and sewers on the Cricklewood Estate, for H. S. H. Princess de Lusignan. Mr. Edwin T. Hall, A.R.I.B.A., 57, Moorgate-street, E.C., architect:—

Todd, W. G., Southgate (accepted) £560 0 0

CROXDALE.—For erection of board-school, Croxdale, near the city of Durham. Mr. Joseph Shields, architect, Durham:—

Kell, A., Chester-le-Street ...	£2,673 11 4½
Brown, W. F., Sunderland ...	2,422 7 3
Atkinson, W. C., Stockton-on-T.	2,310 7 5
Johnson, J., Hartlepool	2,280 0 0
Robson & Tremble, Hetton ...	2,094 4 0
Gradon and Son, Durham... ...	2,062 15 6
Purdie, R., Gilesgate Moor ...	2,060 0 0
Lowes, J., Durham	2,059 0 0
Atkinson & Son, Gates'h-on-Tyne	2,054 11 7
Bailes, G., Durham...	2,053 0 0
Pratt, W., Durham	1,980 0 0
Whaley, J., Durham	1,976 0 0
Taylor, Bros., Blanchland ...	1,960 0 0
Robson, T., Low Fell	1,955 17 4½
Grant, J., Durham	1,940 0 0
Robinson and Tidster, Ferryhill...	1,863 13 0
Elstob, T. J., Houghton-le-Spring	1,798 0 0
Ridley, W., Low Law	1,750 0 0
Foster, W., Croxdale (accepted)...	1,710 0 0
Blackett, W. & R., B. Auckland	1,683 12 6
Hurst and White, Tangley Moor	1,640 0 0

DENBY DALE.—For villa residence, conservatory, stabling, out offices, &c., Denby Dale, near Huddersfield. Mr. Frederick Moorhouse, architect. Quantities by Mr. Hoffman Wood, Leeds:—

Mason:—

Turton, J., Skelmanthorpe.

Carpenter and joiner:—

Holmes, J., Denby Dale.

Plumber and glazier:—

Lidster and Armitage, Huddersfield.

Slater:—

Goodwin, Wm. and Son, Huddersfield.

Plasterer:—

Child, Wm., Denby Dale.

Painter:—

Lawton and Hogley, Holmfirth.

EDINBURGH.—For constructing the Edinburgh Suburban and South Side Railway, being about 7 miles of double railway. Messrs. Trimble and Peddie, engineers:—

Waddell, J. (accepted) £144,000 0 0

EXETER.—For the inclosure of show-yard and erection of shedding at the annual show of the Devon County Agricultural Society:—

Clements, of Chillington, near Kingsbridge (accepted), £652.

FINSBURY PARK.—For building new shop-front and making alterations to premises at Seven Sisters-road, Finsbury Park. Mr. Wm. Smith, architect:—

Larke	£962 0 0
Shurmur	945 0 0
Harper	932 0 0
Durnford and Langham	879 0 0
Stevens	828 0 0
Steel, Bros.	819 0 0
Dodds and Robb	785 0 0
Mattock, Bros....	777 0 0
Wilkinson	750 0 0

FOREST GATE.—For the erection of a pair of semi-detached villas in Earlham-grove, Forest-gate, Essex, for J. Maidment, Esq. Messrs. Hills and Fletcher, architects:—

Alexander	£1,175 0 0
Wire, Bros.	910 0 0
Crisp and Tomlin	892 0 0
Lee, H. (accepted)	820 0 0

HIGHGATE.—For alterations to the "Whittington Stone" publichouse, Highgate-hill. Mr. Wm. Smith, architect:—

Kerry	£598 0 0
Shurmur	593 0 0
Larke	590 0 0
Harper	547 0 0
Durnford and Langham	528 0 0
Stevens, Bros.	470 0 0
Steel, Bros.	460 0 0
Mattock, Bros....	417 0 0

HOLBORN, W.C.—For works of dusting and slopping for the Holborn District Board of Works:—

Dodd (accepted)	£3,000 0 0
More	2,880 0 0

HOVE.—For repairs to Ellen-street Schools, for the School Board of Hove, next Brighton:—

Parsons and Sons (accepted) £37 10 0

[Lowest tender received.]

HOXTON.—For alterations to "White Hart," Hoxton, for Mr. E. J. Rose. Messrs. Wilson, Son, and Aldwinckle, architects:—

Cox	£975 0 0
Shurmur...	874 0 0
Hearle	833 0 0

LANCASTER.—For the erection of the Rogett memorial infirmary at the Royal Albert Asylum for Imbeciles. Messrs. Paley and Austin, of Lancaster, architects:—

Mason's work:—

Baynes, C., Lancaster (accepted).

Joinery:—

Hatch, J. (accepted).

Slating and plastering:—

Cross, E. and Sons (accepted).

Plumbing and glazing:—

Calvert and Heald (accepted).

Painting:—

Warwick, H. (accepted).

LAVENDER-HILL.—For repairs to "Premier" ale stores, 27, Tyneham-grove, Lavender-hill, for Messrs. B. Taylor and Co., Frederick-street, Hampstead-road. Mr. W. F. Potter, architect:—

Hayworth, S., Kingsland	£48 0 0
Hersee, F., Peckham	46 0 0
Walkley, H., Battersea	43 0 0
Weaver and Green, King's-cross ...	43 0 0
Dearing, C., and Son, Islington ...	39 9 0
Butler, G. W., Caledonian-road* ...	39 9 0

*Accepted.

LONDON.—Tenders for alterations to No. 6, Lime-street-square, for the Investment Company, Limited, Mr. Wimble, architect:—

Brass	£3,337 0 0
Ramsey	3,235 0 0
Falkner	3,156 0 0
Colls and Son...	3,133 0 0
McLachlan	3,117 0 0
Ashby and Horner	3,112 0 0
Morter	2,987 0 0

LONDON.—For new manufactory, Nos. 28 and 30, Graham-street, City-road, for Messrs. Carlisle and Clegg. Messrs. Ford and Hesketh, architects:—

Hall, Beddall, and Co.	£8,564 0 0
Lee	8,388 0 0
Roberts	8,168 0 0
Perry and Co.	7,977 0 0
Brass	7,897 0 0
Ashby, Bros.	7,752 0 0
Crabb, G.	7,673 0 0
Morter	7,588 0 0
Conder	7,556 0 0
McLachlan	7,544 0 0
Peto, Bros.	7,444 0 0
Lawrence, E....	7,370 0 0

LONDON.—For alterations to the "Black Friar" publichouse, Queen Victoria-street, E.C. Mr. H. I. Newton, architect:—

Burman	£938 0 0
Lidstone	880 0 0
Auley	787 0 0
Shurmur...	693 0 0
Walker	693 0 0
Beale	671 0 0

LONDON.—For Army and Navy Hotel, Victoria-street, S.W. Mr. F. T. Pilkington, architect. Messrs. Palmer and Ruault, surveyors. Contract No. 1, for foundations:—

Perry and Co. (accepted)

LONDON.—For stables and workshops, Rugby-yard, Lamb's Conduit-street, W.C., for J. W. Elvin, Esq. Messrs. Johnstone and Paine, architects:—

Marsland, J.	£2,760 0 0
Mustoe, G.	2,537 0 0
Sanders, F.	2,531 0 0
Axford, J. B.	2,445 0 0
Langmead and Way (accepted) ...	2,355 0 0

LONDON.—For alterations to a city restaurant. Mr. H. I. Newton, architect, 27, Gt. George-street, Westminster Quantities supplied:—

General works:—

Burman	£938 0 0
Lidstone	880 0 0
Auley	787 0 0
Shurmur...	693 0 0
Walker	690 0 0
Beale (accepted)	671 0 0

Pewterer's work:—

Burrow	175 10 0
Warne	175 0 0
Heath	159 0 0
Saunders (accepted)	151 0 0

LUTTERWORTH.—For the erection of school-chapel and Presbytery, Lutterworth, Leicestershire, for the Rt. Rev. Bishop of Nottingham. Mr. C. G. Wray, F.R.I.B.A., architect. Quantities by Messrs. Linsdell and Giffard:—

Halliday, T. C., Greetham ...	£1,276 0 0
Bromwich, Foster, & Co., Rugby	1,251 0 0
Herbert, T. and H., Leicester ...	1,202 0 9
Parnell, J. and Son, Rugby ...	1,195 0 0
Hewitt, G., Leicester	1,187 0 0
Saw and King, Lutterworth ...	1,100 0 0
Coleman, J., Monks Kirby ...	1,010 0 0
Bass, C., Leicester	974 18 0
Sawbridge & Turner, Lutterworth	954 18 9

PECKHAM.—For five shops and dwelling-houses, to be built in the Peckham-road, S.E. Mr. R. J. Worley, architect. Quantities by Mr. R. C. Gleed:—

Downs, W. B. and Co.	£4,930 0 0
Lawrance, E....	4,850 0 0
Toms, E.	4,829 0 0
Smith, Wm.	4,780 0 0
Taylor and Parfitt	4,359 0 0
Green, G., 11, Powell-rd., Clapton	4,285 0 0

PLAISTOW.—For the erection of a block of three houses in flats, for workmen's dwellings, at Plaistow, Essex, for John Low Roots, Esq. Mr. Thomas Williamson, architect:—

Alexander	£1,300 0 0
Sharp and Everard	1,300 0 0
North, Bros.	1'280 0 0
Button (accepted)	1,260 0 0

REGENT'S-PARK.—For repairs to 29, William-street, Regent's-park, for Messrs. B. Taylor and Co. Mr. W. F. Potter, architect:—

Walkley, H., Battersea	£78 10 0
Hersee, F., Peckham	65 0 0
Butler, G. W., Caledonian-road ...	58 0 0
Dearing, C., and Son, Islington ...	54 11 0
Hayworth, S., Kingsland	49 0 0
Weaver and Green, King's-cross* ...	49 0 0

*Accepted.

RUGBY.—For villa residence at Dunchurch, Mr. Frederic Kilby, Elborow-street, Rugby, architect. Quantities supplied:—

Davis	£897 0 0
Spencer	810 0 0
Bennett	797 0 0
Watson	785 0 0
Lissaman...	756 0 0
Young	710 0 0
Jusan	699 0 0
Heap (accepted)	675 0 0
Tew	630 0 0

Proprietor supplies bricks, stoves, and chimney-pieces.

SALISBURY.—For alterations and additions to premises on the canal, Salisbury, for Mr. Thomas Bloom. Messrs. John Harding and Son, architects and surveyors:—

Pellett, E.	£2,000 0 0
Witt, E.	1,990 0 0
Foley, A.	1,881 0 0
Tomkins, E.	1,831 10 0
Scruse, W.	1,809 3 5
Young and Sons	1,780 0 0
Tryhorn, P.	1,710 0 0
Adey, W. H. (accepted)	1,615 0 0
Wort, J.	1,586 10 0

All of Salisbury.

SALTLEY.—For sewerage works. Mr. E. Pritchard, engineer, 27, Gt. George-street, London, S.W., and 37, Waterloo-street, Birmingham. Quantities by Mr. E. J. Purnell, Coventry. Contract No. 3:—

Fawkes, Bros., Southport... ...	£9,771 0 0
Law, G., Kidderminster	8,777 0 0
Davinson, Wm., Sheldon	8,611 0 0
Hughes, Lower Gornal, Dudley ...	8,500 0 0
Hilton, H., Birmingham	8,147 0 0
Currall and Lewis, Birmingham...	8,075 0 0
Palmer, A., Birmingham	7,703 0 0
Smith, J. M., Westminster* ...	7,600 0 0

* Accepted.

SOMERS TOWN.—For the erection of Presbyterian church, institute, shops, and dwellings. Mr. George Lethbridge, A.R.I.B.A., architect. Quantities by Mr. Chas. H. Searle:—

Church:—

Higgs and Hill	£6,673 0 0
Dove, Bros.	6,545 0 0
Brass	6,346 0 0
Williams and Sons	6,137 0 0
Harris and Wardrop	6,100 0 0

Institute:—

Dove, Bros.	1,440 0 0
Brass	1,434 0 0
Higgs and Hill	1,392 0 0
Williams and Sons	1,300 0 0
Harris and Wardrop	1,300 0 0

Shops and dwellings:—

Dove, Bros.	4,100 0 0
Higgs and Hill	3,968 0 0
Brass	3,788 0 0
Williams and Sons	3,740 0 0
Harris and Wardrop	3,394 0 0

STOCKWELL.—For alterations to 42, Stockwell-road, for W. Yardley, Esq. Mr. H. I. Newton, architect, 27, Gt. George-street, Westminster. Quantities supplied:—

Pack, Bros.	£219 0 0
Mallet	245 0 0
Vears	209 0 0
Burman	207 0 0
Nixon (accepted)	198 0 0

STOKE NEWINGTON.—For completion of Nos. 166, 168 and 170, Stoke Newington-road. Messrs. Waymouth and Son, architects:—

Shurmur (accepted) £1,300 0 0

TOTNES.—For repairing the highways during twelve months, for the town council:—

Cole, R. (accepted) £205 0 0

TOTNES.—For scavenging the borough during twelve months, for the town council:—

Cole, R. (accepted) £122 0 0

WALTHAMSTOW.—For erection of two semi-detached villas at Higham Hall Park, Walthamstow. Messrs. Fairbrother, Ellis, Clarke, and Co., architects:—

Lipscombe	£2,541 0 0
Drew	2,350 0 0
Mattock, Bros.	2,073 0 0
Shurmur	1,962 0 0
White	1,945 0 0
Read	1,881 0 0
Scott	1,840 0 0

WESTMINSTER.—For alterations to No. 10, Strand, for Messrs. Davis and Co. Mr. Henry Jacques, architect:—

Clemence	£1,397 0 0
Toms	873 0 0
King and Son	797 0 0
Laing and Son	785 0 0
Panter and Powditch	745 0 0

WEYBRIDGE.—For proposed new public-house and block of four cottages at Weybridge, for G. B. Holroyd, Esq., from plans by Mr. C. Welch, architect, Chertsey:—

Forsey, J., Chertsey	£1,830 0 0
Nesmyth, H. G., Chertsey	1,800 0 0
Bushell, Sunbury	1,710 0 0
Woods, G., Weybridge	1,658 10 0
Fowler	1,650 0 0
Farley, Kersham	1,625 0 0
Oades, Egham	1,599 0 0
Peters, Oatlands-park	1,585 0 0
Brown, W. and A., Oatlands-park	1,540 0 0
Hunt, R. J., Chertsey	1,498 0 0
Squelch, Egham	1,484 10 0
Brown, A. and H., Addlestone	1,415 0 0

WHITECHAPEL.—For 8 houses, for the Trustees of the Whitechapel Charity Estates. Mr. W. A. Longmore, architect:—

Read	£4,183 0 0
Hunt	4,176 0 0
Pritchard	3,997 0 0
Little	3,789 0 0
Sparks	3,700 0 0
Hearle	3,683 0 0
Ashby, Bros.	3,673 0 0
Outhwaite	3,587 0 0
Gilbey	2,594 0 0

WITHALL.—For schools at Silver-street, Withall, for the King's Norton School-board. Mr. William Hale, architect. Quantities supplied:—

	Schools.	House.	Total.
Johnson, C.	£2,096 0 0	£612 0 0	£2,708 0 0
Parton, W. H.	1,778 0 0	436 0 0	2,214 0 0
Brooks, W.	1,735 0 0	450 0 0	2,180 0 0
Moffat, J.	1,713 0 0	437 0 0	2,150 0 0
Corbett, C.	1,697 10 0	437 0 0	2,134 10 0
Matthews and Son	1,694 0 0	439 0 0	2,133 0 0
Smith, J. and Son	1,698 0 0	426 0 0	2,124 0 0
Wilcox, H.	1,700 0 0	415 0 0	2,115 0 0
Barnsley and Sons	1,678 0 0	418 0 0	2,096 0 0
Bowen, J.	1,630 0 0	414 0 0	2,044 0 0
Clulee, F. (accepted)	1,590 5 0	400 10 0	1,990 15 0

BEST BATH STONE.

Westwood Ground, Box Ground, Combe Down, Corsham Down, and Farleigh Down.

RANDELL, SAUNDERS, & CO., LIMITED,
CORSHAM, WILTS.

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PARQUET FLOORINGS.
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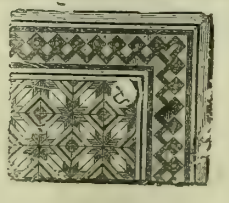

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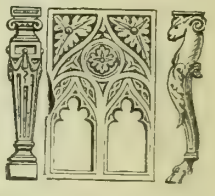

THIN PARQUET (Turpin's Patent). 5-16 inch thick, prepared on deal back laminations, equal in wear to inch Solid Parquet. Used for Veneering old existing deal floors, and is susceptible of removal at pleasure. See Construction.

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DEAL BACKING.

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METAL SUBSTITUTE FOR PUTTY,
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Roofs covered in with 21oz. or Rolled Glass at from 10d. per foot Super., including Bars.

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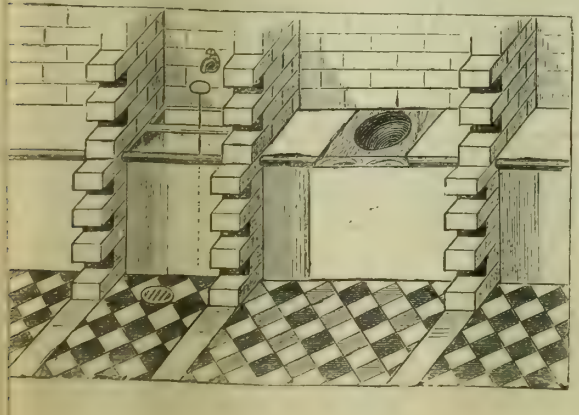
Messrs. FLETCHER, LOWNDES, & Co., Ltd., 13a, Great George St., Westminster.



PATENT TROUGH CLOSETS

For Schools, Workshops, Barracks, &c., and all purposes in which inspection or control is necessary.

These Closets are made entirely of SALT GLAZED EARTHENWARE, with PITCH PINE SEATS. They are Strong, Clean, Free from Smell, and Cannot get out of Order.

Full Particulars and Drawings on Application to

WILCOCK AND CO.,
BURMANTOFTS, LEEDS.

CONTRACTS.

NORTH EASTERN RAILWAY.

TO BUILDERS.

The Directors are prepared to receive TENDERS for the erection of TENDER AND BOILER SMITHS' SHOPS at North-road Engine Works, Darlington, as under:

Contract No. 1:—

Excavator, Bricklayer and Mason, Carpenter and Joiner, Slater, Plumber, Glazier, Gas Fitter, and Painter's Work.

Contract No. 2:—

Ironfounder and Smith's Work.

Plans and Specification may be seen, and further information obtained, on application to Mr. William Bell, the Company's Architect, at York, on and after the 7th instant

Quantities supplied on personal application to parties Tendering for the whole of the work included in each Contract.

Sealed Tenders, marked "Tender for Smiths' Shops, Darlington," to be sent to the Secretary at York, not later than WEDNESDAY, the 23rd instant.

The Directors do not bind themselves to accept the lowest or any Tender.

Ample Security will be required from the Contractor whose Tender is accepted.

C. N. WILKINSON, Secretary.

York, 2nd March, 1881.

CITY of ST. ALBAN.

MAIN SEWERAGE WORKS.

CONTRACT NO. 1

TO CONTRACTORS.

Notice is hereby given that the Corporation of the City of St. Alban, acting as the Urban Sanitary Authority, are desirous of receiving TENDERS from competent persons willing to enter into a Contract for the following works, viz.:—

The Construction of the MAIN and BRANCH SEWERS, consisting of about 21,000 yards of STONEWARE PIPES, varying from 18 inches to 9 inches diameter, with the necessary manholes, ventilators, river crossings, and other works in connection therewith.

The Construction of about 10,000 yards of SURFACE WATER DRAINS, varying from 12 inches to 4 inches diameter, with the necessary gullies, &c.

The Construction of the OUTFALL SEWER to Sewage Land, consisting of about 2,500 yards of Stoneware Pipes, and 200 yards of Cast-iron Pipes, 21 inches diameter, together with the river-crossing, manholes, flushing chambers, &c.

The SUBSOIL DRAINAGE of about thirty acres of land to be used for Sewage purposes.

The Providing and Laying of about 1,100 yards of STONEWARE PIPE CARRIERS, and other Works necessary for distribution of Sewage.

Construction of SCREENING TANK, MANHOLES, BOUNDARY FENCE, and other Work on Sewage Land.

And the Providing and Laying of about 1,400 yards of 15-inch STONEWARE and IRON EFFLUENT DRAIN, with manholes.

Lithographed specification, bills of quantities, &c., may be procured at the office of the Engineer, Mr. James Mansergh, 3, Westminster-chambers, Victoria street, Westminster, or at my office, on and after Saturday, the 5th of March, on the payment of Five Pounds by Cheque or P.O.O., which will be returned on the receipt of a bona fide tender, with bill of quantities fully priced out.

The drawings may be seen at the office of the Engineer, in Westminster, or of Mr. George Ford, City Surveyor's Office, St. Alban's.

The tenders are to be delivered at my office, in sealed envelopes addressed to me, and endorsed "Sewerage Works, Contract No. 1," before Twelve o'clock on SATURDAY, the 26th day of March.

The Corporation do not bind themselves to accept the lowest or any Tender.

ISAAC N. EDWARDS,
Clerk to the Sanitary Authority.

Town Clerk's Office, St. Alban's, 2nd March, 1881.

BUILDERS willing to TENDER for

the ERECTION OF BOARD SCHOOLS, Douglas, Isle of Man, to accommodate 650 children are requested to forward their names to the undersigned, who will send bills of quantities in a few days. The materials will be bricks, with red stone, and local rubble foundations.

BROMILOW and CHEERS, Architects.
21, Harrington-street, Liverpool.

4th March, 1881.

TO BRICKMAKERS.

TENDERS are required for the Supply of LABOUR and MATERIALS necessary in the manufacture of Bricks upon a Building Estate near London.

For particulars, apply to Mr. D. W. ASTON, Surveyor, 1, Addison-road, Kensington, W.

DISTRICT of SOUTH HORNSEY,

MIDDLESEX.

The Local Board for the District of South Hornsey are prepared to receive TENDERS for the ERECTION of NEW BOARD ROOM, OFFICES, RESIDENCE, STABLE, ENGINE HOUSE, MORTUARY, &c., in Milton-road, South Hornsey.

Persons desirous of Tendering must apply to W. Edward Fry, Surveyor and Architect, at the offices of the Local Board, No. 18, Spenser-road, South Hornsey, where the plans, specification, and a copy of the form of contract can be seen on and after Monday, the 7th of March, between the hours of 10 a.m. and 2 p.m., and where information as to the approximate quantities and a form of Tender may be obtained on payment of £1 1s.

The Board does not hold itself responsible for the accuracy of such quantities, which must be verified by the persons desirous of Tendering; nor does it bind itself to accept the lowest or any Tender.

The Tenders, which must be on the printed form supplied, as no others will be received, are to be delivered before 6 o'clock p.m. on WEDNESDAY, the 23rd of March, 1881, addressed to the Clerk of the South Hornsey Local Board, at No. 18, Spenser-road, South Hornsey, N., and must be endorsed "Tender for Local Board Offices," &c.

EDWARD B. BENNETT, Clerk.

2nd March, 1881.

RURAL SANITARY AUTHORITY,

FAVERSHAM UNION.

NOTICE is hereby GIVEN, that the Guardians of the Faversham Union, acting as the Rural Sanitary Authority, will, at the meeting of the Authority to be held at the Workhouse, on Wednesday, the 23rd day of March, 1881, proceed to the Election of an INSPECTOR OF NUISANCES, SURVEYOR under the Public Health Acts, and SURVEYOR OF HIGHWAYS, for the year ending the 25th of March, 1882, at a sala-y at the rate of £250 per annum.

The person appointed will be required to keep a horse, to devote the whole of his time to the duties, and to enter into a bond with two approved sureties in the sum of £100, for the due performance of the same.

Applications, in the candidates' handwriting, stating age and with testimonials, must be delivered at the Union Offices, 44, Court-street, Faversham, before 8 p.m. on the 15th MARCH, 1881.

Notice will be sent to those required to attend before the Authority.

By order,
ALLAN TASSELL, Clerk.

44, Court-street, Faversham,
23rd February, 1881.

For remainder of CONTRACTS, *see p.* XXVIII.

STOCKS.—Good STOCK BRICKS for SALE, at Tanners' Hall Brickfield, Silver-st., Edmonton. Apply for prices to GEORGE CRABB,
PHŒNIX WORKS, Kingsland Green, E.,
Or to the Manager on the Field.

SALES BY AUCTION.

Sale on Tuesday and Wednesday next.—Re C. Batty and Eldridge.—In Liquidation.—Fulham.—To Builders, Contractors, and Others.

MR. F. R. HAYES is instructed to SELL by AUCTION, at Delaford-street and Protheroe-road (both leading out of Rylston-road), Crown-road, and at Dawes-lane, adjoining the Bedford Arms, Fulham Fields, on TUESDAY and WEDNESDAY, March 8th and 9th, 1881, at one o'clock precisely each day, a large assemblage of BUILDING PLANT and MATERIALS, comprising scaffold-poles, wheelbarrows, scaffold-boards, putlogs, cords, 1,200 poling-boards, 1,664 pieces 3 by 2 quartering, 364 ⅞ and 1¼ floor boards, 7 by 2½ battens, quantity of deals sawn for joiners' work, cut clasp nails, deal boards, portable office, rain-water goods, slating battens, and other effects. On view the day prior and morning of sale.—Catalogues may be had on the premises; of Arthur Cayley, Esq., Solicitor, 60, Jermyn-street, St. James's; of Messrs. Williams, Reynolds, and Co., Accountants, 13 and 14, King-street, Cheapside, E.C.; and at the Auctioneer's Offices, 14, King street West, Hammersmith Broadway (adjoining the London and County Bank), and at Turnham Green (facing the Duke's Avenue).

Croydon.—Some of the best Sites in the Town for Shops and Trade Premises.

MESSRS. BLAKE, SON, and HADDOCK are instructed to LET by AUCTION, at the Greyhound Hotel, Croydon, on WEDNESDAY, 9th March, at 5 for 6, on BUILDING LEASES for 99 years, with option of purchasing, the GROUND RENTS, 21 Plots FREEHOLD LAND in some of the best positions in the town, part in the north end of the High-street, and part in George-street and Park-lane, near to and in the main line of the traffic to and from the three principal railway stations and the tramways.—Particulars and plans of Messrs. Hogan and Hughes, Solicitors, 23, Martin's-lane, Cannon street, E.C.; and of the Auctioneers, Croydon, and 32, Nicholas-lane, Lombard-street, E.C.

Second Sale.—Spilsby Prison, County of Lincoln.

MR. R. MACKINDER will offer for SALE by AUCTION, on SATURDAY, 12th March, 1881, the BUILDINGS, as now standing, with all their internal FITTINGS, to be pulled down and removed off the premises—viz.: One-Storey Treadmill House and Cells; Two-Stories Bakehouse; Two-Stories Day and Night Cells, with iron doors, iron bedsteads, Yorkshire stone landings, flags, &c.; Cooking House; Brick Walls; Females' Cells and Dormitories; Warder's House and Look-up; Turnkey's House, &c. Sale to commence at two o'clock.—Spilsby and Skegness, 28th Feb., 1881.

Properties.—Essex and Kent.

MR. W. H. COLLIER is instructed by the British Land Company (Limited), to offer by AUCTION the following eligible PROPERTIES, viz.:—

George-lane, Woodford Hall, and Buckhurst Hill, Essex.—At the George Inn, Woodford, on MONDAY, March 14, at six for seven in the evening, 60 lots of valuable FREEHOLD BUILDING LAND, with excellent frontages to George-lane, the Chigwell-road, and the new roads leading therefrom, adjoining George-lane station on the Great Eastern Railway, from whence there is an excellent service of trains to Liverpool-street and Fenchurch-street; also two lots in Malmesbury-road, on the Woodford Hall Estate, and 10 lots in Russell-road, Buckhurst Hill.

Sydenham, Kent.—At the Greyhound Hotel, Sydenham, on THURSDAY, March 17, at six for seven in the evening, 27 lots of eligible FREEHOLD BUILDING LAND, with excellent frontages to Venner, Byne, and Tredown-roads, leading direct from Sydenham station on the London, Brighton, and South Coast Railway to Penge station on the London, Chatham, and Dover Railway, within a few minutes' walk of either station, trains running frequently to the City and West End, being a portion of the Newland's Park Estate.

The properties will be sold free from tithe and land-tax. The purchase-money may be paid by a deposit of 10 per cent, and the balance can remain on mortgage or contract at 5 per cent. interest, to be paid in nine years by equal half-yearly instalments; but the whole or any part of the balance may be paid off at any time without notice. Free conveyance will be given on the vendor's title being accepted.—Particular, plans, and conditions of sale may be obtained about ten days before the sale at the principal inns in the neighbourhoods; of Messrs. R. and A. Russell, Solicitors, 59, Coleman-street, E.C.; of the Auctioneer, 25, Moorgate-street, London, E.C.; and at the places of sale.

Barnet.—The remaining portion of the Drew Estate, comprising 144 lots of Freehold Building Land, in convenient plots for small houses. Roads and sewers constructed. Free conveyance.

MESSRS. FAREBROTHER, ELLIS, CLARK, and CO will offer for SALE by AUCTION, at the Red Lion Hotel, Barnet, on WEDNESDAY, 16th March, at 7 o'clock in the evening, the above valuable FREEHOLD LAND, which, from its position in the Market Town, and its proximity to the railway station of High Barnet, offers exceptional opportunities to speculative builders or others desirous of erecting residences for their occupation. May be viewed.—Particulars and conditions may be had at the Red Lion Hotel, Barnet; of Messrs. Fisher and Fisher, Solicitors, 1, Queen Victoria-street, E.C.; or of Messrs. FAREBROTHER, ELLIS, CLARK, and CO., 5 and 6, Lancaster-place, Strand, W.C., and 18, Old Broad-street, E.C.

First Portion.—Valuable Freehold Building Land at Finchley.

MESSRS. E. E. CROUCHER and Co. will SELL by AUCTION, at the Assembly Rooms, adjoining the Railway Hotel, Church End, Finchley, on TUESDAY, April 12, at six punctually in the evening, in 100 lots, the first portion of the valuable and improving FREEHOLD BUILDING ESTATE, known as the Elm Park Estate, situate within three minutes' walk of the Finchley Junction Station on the Great Northern Railway, and in one of the most charming suburbs of London, having frontages to Nether street and Dollis-road, admirably adapted for the erection of superior villa and other residences. Water supply guaranteed, gravel soil, well-made roads, and drainage constructed in accordance with the by-laws of the Finchley sanitary authorities. Free conveyance. Nine-tenths of the purchase-money can remain at 5 per cent. per annum interest, repayable over a period of years. Note.—The mansion known as Elm Place, and a suitable plot of ground, will be offered for sale on this evening. The land may be viewed by application to the Foreman on the Estate. Plans, particulars, and conditions of sale may be obtained of Messrs. Whittington and Son, Solicitors, 3, Bishopsgate-street Without, E.C.; at the place of sale; at the principal inns and taverns in the neighbourhood; on the Estate; and at the Auctioneer's Offices, 76, Chancery-lane, W.C., and 223, Seven Sisters-road, N.

City of London.—By Order of the Mortgagee.—A Valuable and Extensive (unfinished) pile of Buildings situate on the west side of St. Andrew's-street, Holborn Circus, nearly opposite the works of Messrs. Pontifex and Wood, Engineers, and covering an area of 6,200ft. super, with a frontage of 50 feet, and an imposing elevation. The premises were designed for an hotel and shops, but they are also available for warehouses, public stores, offices, chambers, and various other purposes. Held on lease from the Corporation of the City of London for 80 years from Lady-day, 1879, at a ground-rent of £400.

MESSRS. DEBENHAM, TEWSON, FARMER, and BRIDGEWATER will SELL, at the Mart, on TUESDAY, March 22, at 2, the above important PROPERTY. The Premises contain on the ground-floor two spacious shops, each about 40ft. by 18ft 6in, public entrance vestibule, three very large rooms, and two rooms on the upper floors, 50 rooms of various sizes, also a fine large room about 47ft. 6in. by 32ft. 9in. (on the first floor). The basement extends under the entire block.—Particulars and plans of Messrs. Johnston and Harrison, Solicitors, 5, Raymond buildings, Gray's-inn; and of the Auctioneers, 80, Cheap 11s.

FIRE at G. MITCHELL'S MARBLE GALLERIES, 166, Brompton-road, London, S.W.—In consequence of the late destructive fire, Mr. MITCHELL has a large SALVAGE STOCK thrown upon his hands, consisting of Marble, Stone, and Alabaster Chimneypieces, Stoves, Fenders, Kitchen Ranges, Tombs, Crosses, Tablets, &c., which he is prepared to DISPOSE OF by PRIVATE CONTRACT immediately, at very low prices. The Royal Arms in stone, large size, slightly damaged. Also a number of Scagliola Columns, &c. Offers for any part of this late valuable Stock are respectfully solicited. Approved bills taken.—G. MITCHELL, 166, Brompton road, London, S.W. Business carried on as usual at 148, Upper Thames-street; also at Chelsea Works.

WEST COMBE PARK ESTATE, Blackheath (roads and sewers made, 20 minutes from Cannon-street).—100 acres of FREEHOLD LAND to be LET or SOLD, in large or small plots, according to situation. Railway Station on the property. Advances made.—For plans and particulars apply to Messrs. J. and J. S. EDMESTON, 12, Great Winchester-street, E.C.; Messrs. ISAACS and FLORENCE, 3, Verulam-buildings, Gray's Inn, W.C.; Messrs. BRISTOW, Solicitors, Greenwich; or to Mr. Z. PARKES, at the Estate Office, West Combe Park Station.

BUILDING LAND to be LET (almost adjoining the Queen's-road station of the South London Railway).—About 50 PLOTS, either as a whole or in portions.—Apply to Mr. H. A. ALEXANDER, 72, Cannon street, E.C.

FOR SALE.—A 6-horse power second-hand Portable Steam Engine, in good condition, and a new 6ft. pan Mortar Mill; price, One Hundred and Twenty Pounds. Can be seen at BARROWS and STEWART'S WORKS, Banbury, Oxon.

SITES for STABLES. Portobello-road, Notting hill.—Coach-houses, with rooms over, to LET. Good roads, pavement, and sewers. No agents.—Address: A. G., 33, Lady Somerset-road, Highgate-road, N.W.

STREATHAM MANOR PARK, next the Railway Station.—Choice BUILDING FRONTAGES to be LET in the intended new road opening out of the main Croydon-road. Houses will be allowed of £50 annual value, which are in great demand at Streatham. A long frontage has already been secured by a local builder.—Apply to Mr. R. A. NOTLEY, Surveyor and Auctioneer, 80, Cornhill, E.C.

TO LET, in consequence of Death of Manager, a PAINTER and PLUMBER'S BUSINESS, established thirty years, in a large and busy town in Kent; about £350.—Address, K. N. P., at Horncastle's, 61, Cheapside, E.C.

TO BRICKMAKERS.—To be Disposed of, the GOODWILL and STOCK-IN-TRADE of a BRICKFIELD, close to Station, near London, on Midland Railway (siding can be put in); good head of clay, 30ft. deep; can be worked by machines.—Apply to PRICKETT, VENABLES, and Co., Surveyors, 62, Chancery-lane, and Barnet, Herts.

TO POTTERS and BRICKMAKERS. To LET, a FIELD CONTAINING CLAY suitable for Pots, Pipes, and Bricks, one and a half mile from Station on S. W. Railway and S. E. Railway.—J. H. K., care of Mr. H. Potter, Farnham.

BUILDING LAND.—UNRIVALLED SITES for superior Villas.—50 acres to be LET or SOLD, 1 mile from Guildford.—Apply to W. G. LOWER, Architect, Guildford, or T. DREWITT and SONS, Land Agents, Guildford.

TO PLUMBERS AND PAINTERS.—FOR SALE, with immediate entry, an excellent PLUMBING and PAINTING BUSINESS carried on by the late owner for over 20 years, the only concern of the kind in a large and increasing population, with a valuable connection amongst country gentlemen. The Stock-in-Trade, Carts, Horses, &c., to be taken at a valuation, and the Freehold Residence, Shops, and Warehouses, which are within a mile of a first-class station on the Great Western Railway, may be purchased, a considerable part of the purchase-money being left on mortgage if desired. The Business is an exceptionally good one, and will bear the strictest investigation. It is being sold by the Executors of the late Proprietor, who recently died.—Apply for particulars to Messrs. EGGINTON and PRESTON, Auctioneers and Valuers, 150, Friar-street, Reading.

TO PAINTERS, PLUMBERS, and DECORATORS.—To be SOLD, a first-class BUSINESS in the above branches, established in a Cathedral City for many years. The premises are situated in the best part of the principal thoroughfare, and may be taken on lease, or the Freehold purchased. A good opportunity for an energetic business man with moderate capital.—Apply to GEO. L. COLLAWAY, Temple Gate, Bristol.

TO BUILDERS, CONTRACTORS, and OTHERS.—First-class BUSINESS and PREMISES, in one of the best towns in the Midland Counties. To be SOLD or LET, the PREMISES in Peacock lane, Leicester, where for upwards of forty years has been successfully carried on the business of Builder and Contractor. The Goodwill and Use of the Machinery, including 10 horse-power Engine and 20 horse-power Boiler included. The Machinery consists of Mortar Mill, Planing Machine, by Robinson, General Joiner, by Worssam, Band Saw and Saw Sharpener, by Powis and Co., and two Saw Benches. If preferred, the whole of the above machinery, or any part of it, can be sold without the premises if desired.—For further particulars apply to WILLIAM NEALE, Peacock-lane, Leicester.

PURE WATER. — All the Messrs. LIPSCOMBE'S FILTERS are now made with their New Preparation of Charcoal, wonderfully effective, far surpassing every other. Old Filters of every kind reconstructed.—Pemple Bar, 44, Queen Victoria-street; 100, Westbourne Grove; 69, Oxford-street.

DRY WAINSCOT in every thickness at 7½d. per foot in the inch. Dry Mahogany from 6d.
Dry Yellow Deals, £16 10s. per 120.
Spruce Deals, £15 per 120, 12ft. 3in. by 9.
Dry Floor Boards, from 10s. 6d. per square,
T. FORMAN, Walnut Tree-walk, Lambeth, S.E.

THOMAS WINN, VICTORIA BUILDINGS, PARK LANE, LEEDS, Entrance opposite the Yorkshire Fine Art Society's New Buildings. Practical Building Valuer, Arbitrator, and Surveyor. Disputed Accounts adjusted, Dilapidations Surveyed. Every description of work in the building line measured and valued. Arbitrations and references undertaken.

EXCELSIOR GAS BATH, £5 10s. 0d.
The "CALDA" INSTANTANEOUS WATER-HEATER, £4 7s. 6d.
PATENT GAS CONSERVATORY BOILER.
G. SHREWSBURY, 59, Old Bailey Factory, Barrington-rd., S.W.

CAEN and AUBIGNY STONE.
EMILE FOUCARD,
Sole Agent for Great Britain and Ireland for LEHOUCHER & JAMES. Prices given F.O.B. Caen, or delivered alongside to any Port in the United Kingdom.
No. 16, STONEY STREET, Borough Market, S.E.

THE BUILDING NEWS.

LONDON, FRIDAY, MARCH 11, 1881.

STONE, BRICK, AND TERRA-COTTA.

WHATEVER may be the merits of the different styles contending for public favour, there can be no doubt that material has a considerable share in the success and workable conditions of any of them, and will have much to do with its general acceptance. Unfortunately, stone has never been employed with any amount of success in London; all our stone buildings have been more or less failures. The smoky atmosphere has done its best to clothe our most costly buildings in a thin drapery of soot, or has accelerated the work of natural decay; they soon become dark and sombre masses, their architectural beauty and details become less and less distinguishable, and people pass them with a scant acknowledgment of their architectural pretensions. St. Paul's Cathedral, despite its blackness, strikes us by the grandeur of its mass, and the magnificence of its proportions; the Royal Exchange by its imposing portico; both are isolated structures, appealing to the eye by their size and magnificence; but how many architectural masterpieces in the City, in less favourable positions, are ever looked at?—the chief reason being that their stone façades have assumed such a sombre monotony of grey or black that all play of light and shade is lost. If we leave the older buildings of Wren and Hawksmoor, Gibbs and Chambers, and look at those built within the past generation, we see little or no difference; they are all irretrievably shrouded in black.

Passing to recent stone buildings, the discolouration is almost as noticeable. Take, for instance, a few of the large stone-fronted buildings in the City—the great hotel in Holborn of the London, Chatham, and Dover Railway Company, a façade possessing much good detail; all the stone façades in Snow-hill; the Deposit Bank, and several offices in Cheapside. Even the Mercers' Company's new premises in Cheapside, hardly finished, and the New Savings Bank in Queen Victoria-street have lost their clean, stony freshness, and have begun to wear the sombre hue so characteristic of London street architecture. It may be noticed that the projecting features, like cornices, string-courses, and pediments, produce a deep black shadow below them, more or less streaked upon the plain surfaces of stone-work, and wherever there is a projection the blackness is increased on one side. In quite new stonework a mottled appearance is first noticed, which gradually darkens. One of the most marked instances of smoke-discolouration, and the patchiness attending its earlier phase, may be observed in the new Temple Chambers facing the Embankment; and it is rather remarkable that all the new buildings of stone have suffered in this neighbourhood. The stone front of St. Stephen's Club-house, the stonework in the School Board offices, the War and Foreign Offices, Whitehall, and even the Grand Hotel and the other new buildings in the vicinity of Northumberland Avenue have lost their freshness. The New Law Courts are putting on a grey tint of carbon, and whether Classic, Gothic, or Renaissance, wherever, in short, stone has been used, we see the same discolouration going on.

There is a monumental character about stone edifices hardly obtainable in brick, and this association appears to be so deeply rooted in the architect's mind that he cannot divest himself of the idea that a building of a public character, a city bank, or an exchange must be a stone building. The Classic architect is especially prone to adopt this view, and he has always striven against brick, as a material unworthy of important architecture. On the other hand, one of the strong points of the Gothicist was that he gladly accepted brick, and availed himself largely of its use, and the popularity and flexibility of the style were mainly due to this cause. The desire for monumental effect has always been a snare to the Classicist. In accepting the highest expression of his art, he has naturally considered stone the only material in which the trabeated form of construction and columnar façades could be adequately carried out; and when this failed him, he scrupled not. Brickwork has become popular with the Queen Anne men. We may notice a remarkable building in the latter style by Mr. Norman Shaw for the front of a bank in Bishopsgate-street. We have no wish to institute an adverse comparison, nor do we deny that the highest class of architecture has always been favourable to the employment of stone; but we think the architect, in this climate at least, has had so many proofs of the failure of stone in smoky atmospheres that he might, in his own interests, begin to consider whether stone might not be applied in a manner less open to the objections we have named. It is quite certain that the failure of many buildings we have instanced has been due to the overwrought stonework, the elaborate carving, and excessive ornamentation of the façades. On those buildings where the ashlar-work has been left untouched, as in the new Gresham Offices in the Poultry, or where the large surface of the front has been left quite plain, the smoky atmosphere has told with less effect. Façades relieved by columnar ordinances, or where the salient features are numerous and the carved relief work is profuse, have, on the contrary, suffered the most. The sooty particles find their way into every nook and crevice; the capitals of columns, the spaces between modillions, the fine quirks and crevices of mouldings and carved work get filled with the accumulated layers of floating blacks till all relief and contrast disappears in one dingy coating of lugubrious fur. Repeated showers and wind drive these particles of soot into every corner and crevice, consolidating them as time goes on. Cannot the architect, in dealing with façades of town buildings, bear the facts we have stated in mind, and if stone must be used, choose a style of Classic freer from the objection? Is it necessary for him always to use the orders, piling them up in agony upon the faces of his stonework, or recessing his front, and leaving nooks for the yearly drift of soot-flakes? Is he compelled to have profusely-carved string-courses and panels that get so choked with dust as to be hardly distinguishable? There are some styles of stone ornamentation, as that so well practised by Sir John Soane, and which have lately found imitators among the French Classicists, less open to objection; the stone face is left plain, and the lesser ornament is sunk instead of being raised. The stonework washes itself clean, and the incised relief, though it gets filled up with soot, does not lose its character.

But why does the Classicist so pertinaciously cling to stone, when he has within his reach the power of fabricating the clay of the district? Perhaps it is because he cannot cut and carve it like he can freestone. Moulded brick and terra-cotta are intractable, and it is this fact which operates against their use. We have, nevertheless, the examples of Italy and North Germany to show how architects have applied brick and terra-cotta in important details, both in the Romanesque and Gothic epochs. Capitals, arches, and friezes found in the German brick buildings show the capabilities of the application of terra-cotta to Classical features. What has been done at South Kensington in one or two of the annexes to the Museum and at the School of Science show the impermeable nature of terra-cotta, and its resistance to the effects of smoke; but we may point with more satisfaction to Mr. Waterhouse's Natural History Museum, and his new building just completed between Piccadilly and Bond-street, where terra-cotta of two shades has been employed with good effect, to show how the Classic architect may turn it to account. Difficulties attending the uncertain shrinkage of the clay and the unevenness produced by warping in long lines of cornices and mouldings, have been the serious obstacles to its use; but with increased facilities for manufacture, the admixture of different clays and substances, these will disappear. It is practicable, however, to erect a columnar façade with cement concrete in blocks at probably less expense than in Portland stone, and the question seems to be worthy of the attentive consideration of those architects who work in the Classical styles, if they desire to place their art on the same footing as regards economy and durability of appearance with that of the revivalists of brick architecture.

WATER-COLOUR DRAWINGS AT THE DUDLEY GALLERY.

THE Dudley Gallery general exhibition of water-colour drawings opens with a choice selection of pictures of *genre* and landscape; domestic and romantic incident being as usual largely represented on the walls and screens. To begin our review in the order of the numbers, two or three architectural subjects call for notice. Mr. John O'Connor, for instance, exhibits a striking little interior transparent in colour, and some vigorous drawing of detail in his "Spanish Portico, Burgos" (5); the richly-carved circular-arch and the colonnade in perspective are drawn with a sympathetic knowledge of Oriental work; and near it is Mr. R. Phené Spiers' scholarly drawing of a Mosque at Luxor, Egypt; but his best effort in this part of the room is a drawing of "Old Doorway, Rustofan, Brittany" (No. 10), a charming sketch of a Late Gothic doorhead, with an ogee-label moulding, crocketed, springing from vertical continuous and projecting jamb members. The grey stonework and the broken arch-mould are handled with much breadth and effect. "St. Alban's Abbey from the S.E." (12), by Victoria S. Hine, is a truthful representation of the old Abbey, refined in drawing and pure in colour. "A December Morning," by Mr. Max Ludley and "Artichokes," the work of a lady artist of much promise, Elizabeth H. Howard, depicting a fair-haired little girl in a field, against a background of dark foliage, are both spirited studies; and the visitor can hardly leave this corner of the gallery without remarking a masterly and powerful study of light and colour in "Hay Barges on the Thames," by Mr. R. W. Allan, an artist who is working evidently in the same spirit as Miss Clara Montalba. The same gentleman's "Street in Granada" (20) is also noticeable for an idealised treatment of a commonplace subject. Those who admire the weird, will find something to captivate them in Mr. John M. Swan's "Sorcerers," a composition exhibiting a skilful handling of the strange and demoniacal.

Rural and domestic incidents are attractively brought to our notice by such works as Mr. H. E. Tidmarsh's "Will He Come?" and Mr. Percy Macquoid's clever reminiscence "Bringing in the Peacock at Christmas," the last founded upon an old custom prevailing in some parts of Wales of cooking a peacock with skin and feathers for Christ-

mas. The young lady in light-yellow gauze drapery, carrying the bird, and the accessories, are well drawn. There is much freshness and a natural sense of colour in Mr. Philip Norman's "Mermaid Street, Rye" (35), with its grass-grown roadway; Mr. Charles Earle's "An Autumn Misty Morning" (37), Mary Forster's "Ringwood, Hants" (64), a quiet and truthful sketch of misty meadows; while upon the same part of the wall we are charmed by Mr. Frank Dillon's "Study of Siberian Crab Blossom," a truthful and sympathetic rendering in colour. The blue vase and the sprig, with the bronzed basin are admirably set off on a background of golden hue. As usual, coast and marine subjects are pretty numerous. We may pick out Mr. Joseph Knight's small study, "In Conway Bay," a pleasant bit of open landscape, such as one may see fringing the coast; the hillock of drift is cleverly managed. Mr. A. W. Weeden's "Storm Cloud" (75) is vigorous and natural in colour; and the highly-finished sketch of the "Land's End" (96), by Mr. Frank Walton, a disciple of the Naturalistic school, sustains that master's reputation for truthful execution, combined with good colouring, though drawn rather at variance with received canons of composition. Next it, Mr. W. T. Richards gives us a grand, forcible, and rocky landscape in his best style, in which body-colour has been largely used to produce effect. Mr. Arthur Severn contributes also a characteristic study, "Sunset at Sea" (201), and Mr. Edwin Ellis a grand picture of rock and billow in his "Summer Sea" (219). Landscape and mountain scenery, always a fascinating theme with the younger school of artists, finds many able exponents. Mr. J. B. Bedford's sunny view, "Clogmen Mawr," is a taking picture; the autumnal tinting in Mr. Pilsbury's "Ploughing" contrasts rather strangely in treatment with the bright and rather too naturalistic colouring in Mr. J. Lewis's picture, "Down where the Bluebells Grow," near it. The former is as sympathetic as the last is painfully realistic in tone. A fine study of mountain and atmosphere is Mr. Walter Severn's "Mountain Tarn in Ireland" (149); but descending to a more modest subject, Mr. John Whipple's "Sheep Crossing Dartmoor" (155), equally excels for its truthful drawing, simple water-colour, and broad handling. Mr. J. M. Dougal, in 301, sends a broadly-treated landscape, a "Hay Field" under a mid-day summer sun. The bright cloudless sky, such as may be seen on an early summer's day, has been well depicted. Mr. Ernest A. Waterlow also contributes a fine sunny upland, in which a peasant girl is seated; the windmill and clump of trees are happily introduced. Hard, and rather heavy in colouring, though sharp and sparkling in bright reflection, is Mr. A. B. Donaldson's "River Witham, Lincoln," but his "Green Court, Canterbury," has a pleasing depth of light and shade, and less mannered in style. No landscapes, however, for power and highly-finished execution, surpass Mr. Joseph Knight's contribution, "Evening" (363), a sandy roadway through banks of tufted grass, with a group of wayfarers; and his masterly and finely-painted subject, "Veiled Sunlight" (564), a landscape or swampy heath, remarkable for the hazy distance and grassy foreground. Both pictures show a keen sense of colour, chiaroscuro, and finished execution. Mr. A. H. Haig's sketch, "At Chartres" (76), is a crisp and clean drawing, in which the artist has thrown a spell of picturesque fancy round the river and cathedral. One of the few studies of romantic incident on the walls is Mr. Lexden L. Pocock's figure of a lady seated, lulled by music; it is heavy in colour, and scarcely suggestive of the poet's sentiment conveyed in the couplet. More sensational is Mr. Waterhouse's "St. Eulalia" (103), where the body of the saint is lying in the Forum shrouded by snow. "Awaiting Sentence" (122), by Mr. F. Cotman, is a clever study of juvenile delinquency. The two urchins standing against the wall have all the expression of anxious expectancy in their countenances thoroughly characteristic of school life. "Consolation," by Mr. C. Garland, is also simply told, only in this case the little offender on chair, with blue sash and long hair, is consoled by an affectionate greyhound. Mr. Henshall's "Leonisa" (150), is a skilfully idealised figure, and the light drapery of background well throws up the dark features of the heroine. Among the sketches of picturesque mother-country "Nuneaton Market Place," by Miss Patty Townsend (152), is interesting as the school place of "George Eliot." The market-place is known in "Janet's Repentance" as the High-street of Milby, and it was here, it is told, the great authoress, when a girl, often rode with her father to market. The work of Mr. Onorati Carlandi is remarkable for the breadth of handling and depth of tone, "A Village Street of the Campagna" (163) is an excellent example of these qualities, and there is a poetic charm in the grey tones of the marble walls. Mr. Arthur Severn gives us a trim garden sketch in his view "Near Ambleside" (173), and Mr. William Stott, in 182 and 270, two able studies of sunlight effect. The girl in blue frock, in a plantation of willows, the gleams of sunlight through which fall upon the figure, is drawn skilfully, and the shadows and half lights are perfect. No. 188, "Light in Darkness," by E. Roseler Franz, is also a clever study of sunlight and shadow, as it can only be seen in Italy; No. 200 evidently conveys an ironical incident: the reflection from the wet roofs and yard is clever; and Mr. Harding Smith's "Youth and Age" is an admirably finished figure study, the title being a metaphorical description of the figures depicted—an aged cardinal in his scarlet robes, about to be assisted by a youth up a flight of stairs. No. 218 is a striking piece of inland river scenery, by Mr. W. G. Addison. The place of honour on the end wall is occupied by Mr. John White's forcibly-painted figure of a child seated on a wicker-work chair playing with a money-box, under the humorous title "The Way the Money Goes." Its massive chiaroscuro contrasts strongly with many other drawings. Mr. Elgood's study in a village churchyard, "Far From the Madding Crowd"; Mr. George Hare's carefully-drawn and finished study of Mediæval costume (233); Mr. Radclyffe's "Farmhouse" sketch (240); Mr. A. Severn's "Rouen from St. Ouen" (243), and Mr. Terry's "Bravo," are all creditable performances, the several merits of which we cannot stop to point out. Of the few architectural drawings, Catherine Thornton's "Arch of the Silversmiths, San Georgia in Velabro, Rome" (274), must be mentioned for the carefully-drawn Renaissance porch. We may point to a few other pleasant sketches, as, for instance (282), bold in depth of tone; No. 286, "Spring," No. 307, a quaint "Old Town-hall, Stonehaven," cleverly managed in the reflected light (373); a drawing of "Siena Cathedral" (361), and one or two humorous studies, especially Mr. Davis Cooper's "Intervention" (338), and an old maid listening over a garden wall to the converse of two unsuspecting lovers beneath, cleverly limned by Mr. Frank Cox (358). Mr. Charles Earle sends two landscapes in a rather mannered style (378, 404). "The Courtyard of an Inn, Verona," by Mr. J. O'Connor, and Mr. H. M. Marshall's "Approach to Westminster," are both correct in drawing and colour. Mr. J. S. Hill has caught the sentiment expressed in the line "Calmly the Day is Dying" (400), and Mr. Henshall has disarmed criticism in his amusing subject, "An Argument" (403), who depicts very skilfully the expressions of the heated debaters in an after-dinner *émeute*. Miss Kate Hastings, in her "The Idle Singer of an Empty Day," (344), has, perhaps, hardly been fortunate in the conception, though the colouring is in a pleasing decorative key; Miss C. Phillott's "Where the Garden Apples Grow" (462), is a more classically thought-out figure, heightened by light drapery, and a marble background. "Bacchus and Pomona," by Mr. Sidney Whiteford (436); "Mother's Cup of Tea," by Mr. J. M. Swan (446); "Les Champs de Colza," by Mr. D. Carr; "A Puddler between Two Fires," by Mr. M'Culloch; "In Possession," by Mr. McFadden; "A Bright Day in Autumn," by J. E. Grace (526), and Mr. Compton's "Midnight at the North Cape" (533), are all praiseworthy. Mr. J. C. Dollman, well known for humorous incidents, sends one of his comical studies in No. 492, though perhaps less happy than the contribution of last year. On the screens a few noteworthy sketches and studies greet the visitor. We may especially draw attention to "Three Studies of Mère Morot" (563), vigorous in light and shade, by Bertha Newcombe, an artist of power in the portraiture of character; "Old Manor House, East Mascul, Sussex," by Mr. A. C. Bell; "In Pass of Killiecrankie" (603), by Mr. John Ruskin, a pre-Raphaelesque study of rocks of much truth and elaboration in finish; one or two pleasing sketches by Mr. Phené Spiers, as No. 602; and a wonderfully conscientious rendering of an "Old Book and Bric-a-brac Store," by Mr. B. W. Spiers, an artist well-known for his consummate fidelity and study of this particular phase of still-life (No. 622). We may also pay a tribute to Mr. Barraud's "Sketch in Surrey" (631); Mr. Woodlock's "Dame Quickly" (637); "Pursuit," by Mr. S. Paget (672), a Quixotic fancy; Miss Jackson's "Chrysanthemums" (673); "Autumn Fruit," by Mr. S. T. Whiteford; and Nos. 668, 671, 627, 591, and 580. The statuettes and models exhibited display invention, especially Mr. D. S. Bloor's "Greedy," a terra-cotta, and Hannan Barlow's "Sympathy," an amusing and spirited modelled subject of the canine and feline species.

THE WATER QUESTION.—IV.

In the Bills now before Parliament for the conservancy of rivers and the prevention of floods, the river basin is the area over which a General Board is to have authority. It is said to be of great importance that the whole river basin should be included, from the source of the river to the sea. The whole basin of a river includes the foreshores and mouth of the river, down to mean-tide level; but for the purposes of a Rivers' Conservancy Act, it would be well to extend the limits of the river authority to low-water mark of ordinary spring tides.

The experience which has been had of one authority improving the course of a river in its upper and middle portions, while another authority has held command of the lower portion and the outfall, has not gone to prove the wisdom of that arrangement, and, therefore, it is now urged that it is important to include under one authority the whole area of a river basin in respect of all the water interests, and the sea is looked to as being the only proper limit of the jurisdiction of such a board. Following the order with which we began, along the south, east, north-east, north-west, and west coasts, there are, from Land's End to Fowey, a distance of 85 miles along the coast—not following every indent of the sea, but a general line—12 rivers or streams, having basins of 47, 40, 29, 33, 10, 33, 12, 40, 66, 50, and 80 square miles respectively, and the river Fowey itself of 120 square miles, as appears upon the map of the "Catchment

Basins of England and Wales," prepared by the Ordnance Department, and published by Mr. Stanford, of Charing-cross.

Proceeding, in like manner, a further distance of 88 miles from Fowey to Dawlish, there are 12 rivers having basins of the following areas:—

Name	Area.	Name.	Area.
——	71	Yealme	36
Lynher	100	Erme	43
Tamar	385	Aune	54
Tavy	85	——	73
Plymouth Leat..	23	Dart	200
Plym	59	Teign	203

From Dawlish to St. Alban's Head, a distance of 90 miles, there are nine rivers, the areas of the basins of which are, in square miles, as follows:—

——	11	Char	39
Exe	584	Brit	52
Otter	82	Bredy	21
——	21	(Weymouth) ..	87
Axe	165		

From St. Alban's Head to Littlehampton, 95 miles, there are 13 rivers—

Frome	187	Itchen	231
Piddle	119	Hamble	35
Stour	459	——	85
Avon	673	(Portsmouth) ..	235
Lymington	91	——	26
Beaulieu	52	Arun	370
Test	477		

The Isle of Wight is not included; it has a coast line of about 55 miles, and 5 rivers.

From Littlehampton to Dover, 95 miles, there are 8 rivers—

——	35	Cuckmar	75
Adur	160	Old Haven	121
(Brighton)	56	Rother	312
Ouse	205	——	88

From Dover round by the North Foreland and Whitstable and outside the Isle of Sheppey to Sheerness and up to Chatham, and down the Medway again to Sheerness, and up the Thames to Greenwich to meet the basins of the Thames proper and the Lea, and, crossing over and going down the north shore round by the mouth of the river Crouch to Bradwell, the distance is about 185 miles, and there are the following rivers:—

Stour	373	Thames and Lea	4613
The Swale	157	Roding	317
Medway	680	Crouch	181
Cray and others	314		

Proceeding along the east coast to Great Yarmouth, and about 20 miles beyond, to the division of the watersheds of the Bure and Waveny, a distance of 100 miles or thereabouts, the following rivers discharge:—

Blackwater	434	——	32
——	24	Alde	109
Colne	192	Minsmore	34
——	53	Blyth	79
Stour	407	——	53
Orwell	171	Yare & Waveney	880
Deben	153	Bure	348

Again, to and a little beyond the Withern Eau, at Saltfleet, a distance of about 130 miles.

Glaven	293	Welland	760
Nar	131	Witham	1079
Wissey	243	Steeping	101
Ouse	2607	Withern Eau ..	189
Nene	1077		

Passing the mouth of the small river Ludd, and entering the Humber, and proceeding along the south shore past Grimsby, New Holland, and Winteringham, we come to the mouth of the Trent, then the Don, the Aire, and the Yorkshire Ouse; and, on the left bank of the Ouse, the Derwent, and lower down, the Foulness and the river Hull; then, passing round Spurn Point, we come to Hornsea, having traversed the tideway for a distance of 135 miles or so, although the coast-line from Saltfleet to Hornsea is not more than 40 miles; yet we are bound to go so far up the Humber to meet those great rivers the Trent, the Don, the Aire, the Wharfe (the area of which is here included in that of the Ouse), and the Ouse itself. The areas of these river-basins are as follow:—

Ludd	139	Aire	815
——	39	Ouse	1842
——	122	Derwent	794
Ancholme	244	Foulness	133
Trent	4052	Hull	364
Don	682	——	206

Resuming, there are, from Hornsea to Redcar, a distance of about 80 miles

(Scarborough) ..	157	Esk	147
		——	100

From Redcar to Tynemouth, 44 miles, there are

Tees	708	Wear	456
——	77	Tyne	1130

From Tynemouth to Berwick-on-Tweed, 60 miles

——	31	Coquet	240
Blyth	131	Aln	104
Wansbeck	126	——	129
——	37	——	37
——	18	Till	231

The object we have in view in making these tabular statements is to show, at a glance almost, what a large number of small river-basins adjoin the sea-coast of England and Wales; but without further remark at present, upon that point, we proceed to the north-west coast, and follow it and the west coast to Land's End, whence we started.

From the river Line, in Cumberland, to the mouth of the Kent, at the head of Morecambe bay, there are the outfalls of the rivers of the Lake district of Cumberland and Westmoreland, the distance being about 125 miles to the southern watershed of the river Kent.

——	21	Calder	28
Line	104	Irt	61
Eden	915	Esk	64
Wampool	78	Duddon	46
Waver	70	——	28
Ellen	72	——	56
Derwent	262	Leven	202
——	11	Kent	255
Ehen	72		

These rivers convey into the sea the surplus waters from Ulleswater, Haweswater, Bassenthwaite lake, Derwentwater, Thirlmere, Crummockwater, Buttermere, Loweswater, Ennerdalewater, Wastwater, Coniston water and Windermere.

From the watershed of the Kent, round by Blackpool and up the Ribble nearly to Preston, and back by Southport to Formby, near the mouth of the Mersey, is about 50 miles, along which the following rivers discharge:—

Lune	418	——	7
Wyre	208	Douglas	168
Ribble	585	——	55

Going from Formby up the Mersey about 10 miles above Liverpool, and crossing over to the mouth of the river Weaver, back by Birkenhead to the mouth of the Mersey and round by Hoose and West Kirby to the head of the Dee estuary, and back round Air Point to the coast at Prestatyn, the distance is about 85 miles, and it includes the outfalls of the basins of the following rivers, viz.:—

Alt	126	Weaver	711
Mersey	885	Dee	813

Thence along the northern shore of Wales, round by Great Orme's Head and through the Menai Strait along the western coast of Carnarvon and round to Aberdaron, is 90 miles, and the following rivers fall in:—

Clwyd	319	Seiont	143
——	39	Soch	33
Conway	222	Erch	55
——	78	Dwyfach	48

The Isle of Anglesey has a coast line of 100 miles, and 5 rivers—

Braint	53	——	69
Cefni	41	Alaw	58
——	47		

From Aberdaron, along the shore of Cardigan bay to Cardigan Head is 100 miles, including—

Prysor	141	Wyrai	23
Artro	45	Arth	31
——	3	Aeron	52
Mawddach	151	——	48
Dysynni	64	Teifi	386
Afondyfi	217		
Lery	34		
——	24		
Rheidol	70		
Ystwyth	75		

From Cardigan Head round by St. David Head and St. Govens Head, to the mouth of the Bristol Channel at Worms Head, is a distance of 160 miles, in which are—

Nevern	94	Towy	514
(St. Bride's bay)	65	Gwendraeth	73
Cleddau	212	Llwchwr	156
(Pembroke)	114		
——	61		
Taf	183		

From Worms Head along the South Wales shore by Swansea, Cardiff, Tredegar, and Newport, to the watershed dividing the Wye from the Severn basins, is 100 miles or thereabouts; and there are 12 rivers, viz.:—

——	66	Rumney	94
Tawe	106	Ebbw	94
Neath	118	Usk	540
Afon	87	——	55
Ogmore	114	Wye	1,609
——	67		
Ely	81		
Taff	198		

Taking the Severn basin properly to terminate where it meets that of the Wye on one side of the Channel and that of the Bristol Avon on the other, near Aust passage, and returning down the Channel on the Somerset and Devon shore to its mouth at Hartland point, west of Bideford Bay, there are, in 120 miles, 15 river basins, including that of the Severn, viz.:—

Severn	4,350	——	24
Avon	891	——	29
Yeo	106	East Lynn	41
Axe	101	——	47
Brue	197	Taw	455
——	80	Torridge	336
Perrett	562	——	10
——	82		

On the Devonshire and Cornwall coast, from Hartland Point to Land's End, there are river basins of the following areas, in a distance of 110 miles, viz.:—108, 8, 149, 154, and 43 square miles; and another, in which St. Ives is situated, of about 10 square miles.

Now, seeing that there are, as above set down, so many small river-basins all along the coasts of England and Wales, how would these be dealt with by the Bill now before Parliament? Each large river-basin would very properly be constituted a district for the conservancy of all the water interests in it, but of the others—what? The words of Mr. Magniac's Bill, bearing on this point of the constitution of the districts, are "the basin of a river having its outlet at the sea," and of the Government Bill, "a river-basin or contiguous river-basins." Under the first of these each of those small river-basins above described would constitute a conservancy district; under the second, the jurisdiction of a river board proper might be extended coastwise from the mouth of the river so far as to include one or, in some cases, two small river-basins in each direction; but it would hardly be found convenient thus to extend the jurisdiction of those boards farther than that; and, indeed, in most cases it would probably be found to be inconvenient to go so far even, and that it would be better to limit the authority of a large river board to the immediate foreshores; and it would appear that several of the smaller river-basins should be combined under the authority of a coast board whose jurisdiction would extend in each direction to meet that of a river board proper, and thus to cover the whole ground; and

although but little or nothing may be required to be done along the coast itself, yet, in case of need, there would be an authority to act. In the twenty-two sections of the coast above described, the divisions are made at the water-sheds of contiguous river-basins, and where smaller river-basins are bracketed with others, it is an indication of a probable convenience of arrangement, subject, perhaps, to much amendment, for in any proposed combination of the small river-basins, local feeling must have sway, and ought, perhaps, to govern the result; but whether between the mouths of the larger rivers the smallest river-basins should each form a conservancy district, or that several should be combined, they would best be dealt with by coast boards in conjunction with those of the larger rivers.

HORTICULTURAL BUILDINGS.*

HORTICULTURAL building is a branch of construction so surrounded by technical considerations, that it is impossible to deal with the subject from a purely artistic point of view. The architect feels the difficulty of reconciling the horticultural builder's ideas of fitness with his own, and, on this account, it appears to be almost inconceivable for him, with any consistency, to consult the "artistically" prepared catalogues of well-known firms. We have, on several occasions, regretted that no reliable and practical treatise on the subject was within the reach of those who required information, but who did not want to be bound by the conventional systems of greenhouse buildings and gardeners. Mr. F. A. Fawkes, of the firm of T. H. P. Dennis and Co., of London and Chelmsford, a well-known firm of horticultural builders, has brought out a book which furnishes the sort of practical and independent information we have indicated. Mr. Fawkes's treatise does not pretend to give hints on design to the architect, but to furnish him simply with those constructional and mechanical points which, as the author puts it, should be decided by the horticulturist. A few of these necessarily touch the vicissitudes of the seasons, the relation of the inclination of the solar rays to roofing, aspect, drainage, ventilation, heating, &c. The effects of the sun's altitude during the longest and shortest days are pointed out by diagrams, the warmest rays being, of course, those which fall upon a horizontal plane in a nearly perpendicular direction. In this climate the maximum angle is nearly 62°, and occurs on the day when the sun attains its longest duration above our horizon, while the angle of the sun's obliquity during the shortest day is about 15°. On these simple facts rest the whole philosophy of roofing our greenhouses economically. On the chapter on "Sun's Rays" the author quotes the table of Bouguer, showing the loss of light by transmission through and reflection from glass. From the latter of these the proportion of light-rays lost by reflection from a smooth plate of glass is shown to be considerable. Thus, at an angle of 5° made by sun's rays with glass out of 1,000 rays impinging, more than 50 per cent. (543) are lost by reflection, while, at an angle of 70° to 90°, only 25 rays per 1,000 are lost, a fact which at once informs us that a roof so pitched that the rays shall strike it nearly at a right angle is the most desirable. At any angle between 60° and 90°, only a proportion of 2½ per cent. of the sun's rays are lost; but allowing for other considerations, the most favourable pitches, according to Mr. Fawkes, vary from 36° to 45°, for latitudes ranging from 50° to 59°, that is taking into consideration little aid from artificial heating. But there are other conflicting constructional conditions pointed out by the author which the architect ought to consult. A lower pitch than 26° is no safe for glass; a flat one requires to be securely tied to prevent thrust, and on the whole, where the sun's rays are necessary, from 26° to 44° is recommended as a good inclination for general purposes. Aspect and site are discussed; but, of course, on these heads, the architect ought to be as good a judge as the horticulturist. A southern aspect is perhaps the best for a lean-to; for a span-roof, one in which the axis or ridge runs north and south, so that each side receives its share of the sun's rays. As in other points, the question of aspect depends on the kind of plants grown, and various other local considerations.

The chapter on levelling may appear rather superfluous in a work treating on horticultural buildings, yet the subject unquestionably forms a useful branch of the practical business of the horticultural builder. An important section is that treating of sections of growing houses, and the diagrams given will be found of use to the architect, as the particulars of height of front wall, staging, the opening of the lights, &c., are indicated. Lean-to, span-roofs, with and without front lights, three-quarter span, curvilinear, ridge and furrow houses are discussed. The author says, speaking of the claims put forward for curvilinear roofs, "it is open to question whether their advantages are not overwhelmed by their disadvantages." He admits, however, that the solar rays are transmitted in a better manner than through other forms, and architecturally we are inclined to prefer the circular section to the flat roof for lean-to's, the chief difficulty experienced being the construction of ventilators for curved roofs, to say nothing of the cost of the ribs. Conservatories or show-houses are made the subject of remark in another chapter. It is certainly true that the horticultural interest has been hitherto the paramount one, and that architects have allowed the conservatory to escape attention. Until, indeed, it is looked upon as an addition to the reception-rooms of a house, its treatment will be neglected and made subordinate. The remarks made under this head are generally judicious: the lines of a conservatory should harmonise with the structure to which it is attached, and fussy detail ought to be avoided. The designs given are not to our minds fortunate instances of the application of these principles, though they indicate some approach to a more artistic conception of details than one generally finds in illustrated catalogues. A few plans showing the connection with the reception-rooms would have been usefully given; for we consider the most important solution of the difficulty the architect is called upon to work out is to make the conservatory adjunctive to the house, and not treat it as a separate building. It ought to be treated more as an apartment, and less as a growing-house; staging is not necessary, and a good paved floor is almost an indispensable condition to effective design. A few useful constructive hints are given about roofs and gutters, features which are generally left to a whim on the part of the designer.

We have no room to dwell on the subsequent chapters treating of garden-frames, plant-protectors, subsidiary erections: glazing and various technical matters come in for a share of attention. Few practical horticulturalists will be found, we think, still prejudiced in favour of putty as a fixing for glass. The author describes the systems known as Helliwell's, Rendle's, Johnson's, and Shelley's, and the sections of the bars are illustrated by diagrams; but rather unadvisedly concludes by the assertion that "a lengthened experience of the various systems in mechanical glazing have confirmed the conviction that if proper materials be used, and the process carried out carefully, no system is better adapted for horticultural buildings for growing purposes than glazing with putty." We venture to think the objections urged against the "artificial systems" are somewhat trivial as stated. Because the "world is intensely conservative" that is no reason why a "system, however good," should not supersede a bad system. No doubt some of the mechanical systems fail in allowing either too much play for the glass, or do not afford a uniform joint; but these objections have been overcome, as we last week pointed out, in the use of Fletcher's "Substitute." Vulcanite fillets and other elastic substances between the metal and glass no doubt quickly become brittle or decay; but the same certainly holds good with regard to common putty. The details of staging given are of practical value. On the subject of ventilation little new is said. Our author prefers framed lights hinged at the top to other kinds of opening, and they are recommended even in preference to pivoted centre ventilators for ordinary buildings. Of course, inlets should be as low as possible, and top ventilation high. Various modes of heating, such as flues, hot-air stoves, high and low pressure hot water, are all discussed, and these sections will be found of value. But we have no space left to say more on Mr. Fawkes's book. Even a few words on metereological matters, and the use of barometers and thermometers, anemometers, &c., are added; and a short chapter on the law of tenants' fixtures, and Building Act regulations. A good index is given. The work is copiously illustrated; and every horticulturist and architect will find the treatise a useful summary of technical information and data.

* Horticultural Buildings: their Construction, &c. By F. A. Fawkes. London: B. T. Batsford, 52, High Holborn.

ROYAL ACADEMY LECTURES ON ARCHITECTURE.*

(*Continued from page* 225.)

THE PRINCIPLES OF THE ART.

IT is obvious that in all systems of proportion, the parts or divisions of a building which are treated in relation to each other must be either really connected with each other, or so visible together at one time as to be naturally looked at as united members. There need, therefore, be no connection between the lines which settle the proportions of the interior and exterior of a building. What is intelligible is that there should be a distinct relation or system of proportion between features which the eye is certain to compare together,—as, *e.g.*, the height of a column to that of its entablature, the dimensions of a metope to those of a triglyph, and the proportions of both to the diameter of the column and the width of the intercolumniation. Another mode of deciding the proportions has been ingeniously formulated by Mr. Watkiss Lloyd in his calculations as to the system of proportion adopted in the Parthenon. It is impossible to deny that his discovery appears to be a real, and, if so, an important one, though the system adopted seems on the face of it to be wholly arbitrary. He shows that the proportions are all derived from a system of figures standing in the ratio of 1 to 6, that is, separated by the number five—as, for instance, 1-6, 2-7, 3-8, 4-9, 5-10, and so on. Thus the breadth of the top step is to its length as 4 to 9. The height and width of the front as 9 to 14, and the height of the front to the length of the building as 2 to 7, and so on. What is not clear is whether such a system was peculiar to this one building; and even then I fail to see why it should produce a good result. Vitruvius, speaking of rules for proportion, says that,—

"The ancients have directed these to be observed in all works, but more particularly should they be attended to in the temples of the gods, in which the faults as well as the beauties remain to the end of time."

And for the last two centuries or more men

* By George Edmund Street, R.A. No. 2, delivered Thursday, Feb. 17, 1881.

have been endeavouring to discover what these rules are. They have succeeded in ascertaining many facts of the highest interest. And there is evidence that in Mediæval times similar rules were observed to those which Vitruvius laid down. To mention one only. In 1521 Cesare Cesariano published a book on the subject, Cesariano, in his Commentary, gives a plan, section, and elevation of Milan Cathedral, which, after Vitruvius, he calls the "Ichnography," "Orthography," and "Scenography," "*A Trigono as Pariquadrato perstructa Germanico more.*" And "*Secundum Germanicam Symetriam.*"

Professor Cockerell took much pains, many years ago, to show that William of Wykeham planned the chapels of his colleges at Winchester and Oxford by the aid of geometrical figures, and there is, no doubt, something fascinating in the suggestion of any scheme which shall involve as a certainty a well-proportioned work. Whether laws can be laid down which can be generally applied is open to grave doubt; but Cockerell's words are, in any case, true, and worth quoting:—

"The perception of proportion, the fundamental element of the beautiful in architecture, seems to be the last acquirement of the student instead of the first. We begin by admiring ornaments, details, and forms; but it is at a more advanced stage only that we make all these subordinate to that sense of rhythmical proportion and that harmony of quantities which affect the mind like a mathematical truth, and, like a concord of musical sounds on the ear, is perceived and confessed by the eye as obvious and unalterable."

The only fear in such investigations as these is, that any of you should be led to suppose that any system can stand in place of the genius of an artist. The utmost that you will arrive at by such a process is the avoidance of errors of general proportion, it being very manifest that this is possible.

But it would be a calamity if you were led to suppose for an instant that the use of a mathematical formula could or ought ever to be substituted for the cultivation of the eye; that is, of the natural sense of good proportion or rhythm in architecture. It is by the careful observation of cultivated eyes that some of the most delicate, and at the same time most important, rules have been arrived at for our guidance. A few of these may shortly be referred to here. There is, first, the entasis of the Greek column. The column, first of all, was made to taper, so as to give it the greatest possible appearance of stability, and then it was perceived that there was some appearance of the outer lines being very slightly concave. This is an effect which you will find constantly in absolutely straight lines. A ceiling, the side of a spire, a long line of steps, will all of them, if absolutely straight, appear to be concave. The Greek artist remedied this by the most delicate increase of dimensions, giving his column an almost imperceptibly convex outline,—no more than was enough to correct the ocular deception which the straight line produces. In old examples this entasis appears sometimes to be exaggerated, owing to the decay of the stone or marble at the junction of the column with the capital. And it is important to notice, also, that the entasis was not given where good reason existed for omitting it.

Thus, in the two ranges of columns forming the *cella*, the columns of the upper range are continuations of those below them, with an entablature inserted between them. In this case, if the upper and lower columns had had any entasis, there would have been a disagreeable conflict of curves, and so these columns are all formed with straight outlines. Another practice was to make the columns slope slightly inwards, so as to give a greater appearance of strength; another, the placing of the outside columns nearer to each other than the rest; another, the giving a slight curve to the architrave, for the same reason as the entasis was given to the column; and another the making the whole tread of the long line of steps on which the temples were placed slightly higher in the centre than at the ends. In Gothic architecture you will find the same delicate modifications to meet various optical effects. Spires undoubtedly sometimes had an entasis. It was usually so delicate as not to offend; and, indeed, it may almost be said that directly the entasis is obvious it is offensive. The spire-lights and pinnacles of spires were also so contrived as to produce the same effect. Then columns were often banded, not in the centre, but slightly above the centre. The reason is that if you band a column in the exact centre the upper half of the column is certain to look longer than the lower half. Then just as the Greek column was inclined, so are the walls of many steeples. Good examples of this are seen in some of the best of the beautiful group of Normandy steeples which make the neighbourhood of Caen such delightful ground to an architect. Another delicate adjustment is constantly adopted in old traceries, but seldom, I fear, noticed. This is the change in the dimensions of mouldings when the tracery becomes intricate, and where the moulding proper for the large lower lights of a window would, if carried throughout in a mechanical way, entirely block all the smaller lights and spandrels of the tracery and cusps. Another is the stilting of arches slightly, in order to make the curved line sit with sufficient quietness and dignity on the cap; another the modification of the curved lines of cusps to give the same effect. These, indeed, were often drawn by hand; no other way allows of their curves showing such delicate growth. At Lincoln, the cusped arcades are all so drawn. In the Italian arched canopies to porches and monuments, where the arches are so constructed as not to be able to stand without iron ties at the base, the arch was weighted on the under side with a somewhat heavy trefoil, the effect of which was to give an appearance of stability. These illustrations will be sufficient to show you how universal has been the desire of architects in all ages to adopt the most subtle variations for the sake of securing the best possible effect in their work, and how important it is, therefore, to remember that the training of the eye is far more necessary to the architect than the closest adherence to the precepts of Vitruvius and those who have followed in his steps, interesting and valuable though these precepts may often be, and full of suggestions well worth following out.

The other elements that I have named are what we look for in the best work, but they are not so indispensable as those already mentioned, and for this reason: they are elements which may be aimed at, more or less, according to the choice of the architect. He may aim, if he chooses, at breadth of effect; and he will always do well to do so. But he may equally aim at a picturesqueness which sacrifices breadth, and which, if it arises naturally out of the conditions of the case, is by no means to be despised. In all cases, also, the treatment of the design with the object of impressing the eye with a real idea of its scale is important. It hardly admits of discussion whether or no the artist is skilful who makes the scale of his building look smaller than it really is, for it requires much skill so to dispose and proportion the various members as to make each appear to be of the right size for its place, and yet to add to, rather than diminish, the apparent size of the whole. But I think all these points will be more easily dealt with if we go on now to consider, as far as time will admit, the evidences we have in ancient buildings of the close attention which was paid by their designers to subtle principles which it is necessary to master if we are to produce work at all comparable to theirs.

In one point all ancient work agrees. This is, that all parts of a building must be equally well designed. No good work is ever done which is done solely for show. If you really love your work, you will make it good all round,—as simple as you like; for it would be absurd to make work which can hardly be seen as elaborate as that which is meant for the delight of the eye of every passer-by,—but still good in its proportions, and in its detail, wherever any is introduced. To how many buildings of the first half of this century would it be possible to go with this impression of an architectural *sine quâ non?* The truth is that only too often men seem to have thought that one elevation of a building would be all that would ever be seen. They have satisfied themselves with handsome geometrical elevations of the principal front, and have assumed that every one would be polite enough not to look at the work in perspective. So you see grand cornices in front, none at all at the ends, stone on one side, compo on the other, and other similar mistakes. For the same reason, no discovery that old architects often indulged in sham fronts to their buildings justifies their erection now. From some point of view, the deception is quite sure to be detected, and when found out produces the worst possible effect. Moreover, it is hardly possible to design a sham front which does not at once condemn itself, because it almost always happens that the features, which are used merely because they are pretty, having no corresponding structure behind them, have no structural effect, and thus prove themselves to be unnecessary impostors.

A sham feature is often introduced for the sake of symmetry, and it is worth while to consider how far the symmetry which depends on uniformity is a necessary feature. The uniformity which arises from an absolutely similar requirement throughout a building is natural and defensible. Examples of it may be seen in the repetition of the columns round a Greek temple, in the uniform design of the outside wall of a Roman amphitheatre, where each bay, having similar requirements, is almost identical with the rest; and in the bays of a Gothic cathedral nave, all of which are almost of necessity alike, because each follows exactly from the same construction. Nevertheless, uniformity may easily ruin the effect of a work in which, in the right place, the principle has been admitted to the full. Imagine for an instant such a work as Notre Dame, Paris, altered for uniformity's sake by the erection of a choir exactly like the nave, with two eastern steeples corresponding with the grand examples at the other end, and you will see at once how entirely ruinous this sort of symmetry may be.

Repetition of similiar features where the requirements are the same seems to me to be the true sort of symmetry to aim at. In this way you gain the required effect without sacrificing convenience or truth. Then, if the site is not symmetrical, or if the building is the result of a series of erections at different periods by way of additions to something older, it is far better to give up the idea altogether, and to let the building tell its story. This is a way in which the Greeks acted on the Acropolis at Athens. Nothing can be more deliberately unsymmetrical than the planning of the matchless buildings on this sacred spot. The temple called the Erechtheum is an example of the most singular interest in this way. The Greek artist not only disdained the attempt to make all the buildings agree with each other, but may rather be said to have been bent on making them all as different as possible. He then placed them at all sorts of angles with each other, knowing that the picturesque effect of which he was so fond would thus be secured, so that, in truth, the whole group may rather be said to be too deliberately picturesque, if it has a fault at all. The houses, temples, Forum, and other buildings at Pompeii are examples of precisely the same feeling. They all bear distinctly the marks of their history. Each house had its own character, and its own arrangements. There was no pretence anywhere to accommodate the architecture of a whole street to what might be deemed to be the average wants of the inhabitants. And in the street which above all others has architectural character,—that of the Tombs,—you walk now, as men did from the first, between a succession of more or less stately monuments and monumental chapels, none of which have been made with any reference to the effect of their neighbours, but solely with reference to the wishes, the pride, or the wealth of the men who put them up. In the same way the Forum is regular, but the temples which surround it are quite irregularly arranged, and upon altogether different designs; and the laying out of the streets, not being regular or rectangular, just the same irregularities occur that we find as a result of natural growth in our own old towns. In Mediæval times precisely the same view was taken as by the Greeks. Historical truth and life-like character in the design were preferred to uniformity as an almost invariable rule. And in all good work you will find, even where there is apparent symmetry, that considerable differences exist. At Notre Dame, Paris, the two western steeples are essentially symmetrical, and were probably erected at the same time, but there are important differences of detail in them, which give a charm and life to the work which it would not have had if each had been a mere repetition of the other. And in earlier times, in the façades of St. Mark's, at Venice, and of the Cathedral at Pisa, you will find that the apparently corresponding dimensions of doorways and arches do not really tally at all, and have evidently been deliberately varied, in order that the eye might be unconsciously saved from the weariness produced by too great uniformity.

The Mediæval architects have left some most remarkable examples of the extremely small effect that the desire for uniformity had upon them. Of this there is, perhaps, no more convincing example than the façade of Chartres

Cathedral. This had a west front, flanked by two steeples, one of which only was completed by the end of the twelfth century with a spire, which, for beauty of design, is not far behind the very best of its period. It was no sooner built than the whole church, save the west front, was rebuilt after a fire, and on a grander scale, so that the new nave-roof, reaching to the base of the spire, very much spoilt its effect. Then, in the fifteenth century, one of the greatest men of his time, Jean Texier, was employed to build on the ancient north-west tower a second spire to complete the front. What course do you suppose he adopted? The nineteenth-century answer is, of course, in favour of a steeple exactly like the first, so that though both would then be too low for the roof, there might nevertheless be that uniformity which is now usually supposed to be the right thing to strive for. Texier did nothing of the sort. He boldly declined to look at the early spire, and simply set himself to work to build the loveliest spire he could design. And his work is a success from every point of view. It is exquisite in itself, properly proportioned for the height of the church, and though so unlike it, groups well with the other spire, and the result is that we have the pleasure of seeing two *chefs d'œuvre* where otherwise we should have had only one design to admire.

Some of you may perhaps ask whether, after you have done your best to attend to all the principles which I have been insisting on, your work could be worthy of being called really one of architecture, in the absence of all sculpture and painting. Some writers—and they are men of the greatest authority—deny by implication that they can be. But though in my last lecture I told you how strongly I desire to see the three arts employed together, I am not disposed to allow this, and I shall insist upon it now, because I think that for young men the habit of designing without the aid of figure sculpture is very important. A drawing of a poor design may sometimes be made to pass muster by a daintily-drawn representation of sculpture; but this is not what is first wanted. At the same time, though it is necessary to be able to dispense with the aid of the sister arts, it is equally necessary that you should know how to avail yourselves of their assistance. The best work is that, as I have before told you, in which all the arts are combined. And no form of architecture can be pronounced to be contemptible in which these accessory arts have been highly developed. The grandest architecture can, however, exist without such aid. It is not absolutely necessary; and if circumstances compel the architect to dispense with it, he is in no degree whatever relieved from the necessity of doing the very best work. Certainly we have only to think of some of the buildings which are amongst the noblest works remaining, to perceive that they never depended entirely upon sculpture for their effect. Little, if any, is left on the remains of Greek art. The sculpture is now in museums, and the architecture, unadorned by it, often still remains. No one can say that the buildings have obviously suffered by its removal, for in some it can hardly be said whether there ever was any sculpture or not; and yet in such cases, of which the Temple at Bassæ and the Temple of Neptune at Pæstum are typical examples, it is impossible not to feel impressed in the highest degree by the art exhibited. The same feeling is excited by the monasteries built by the Cistercian order. They were built under a rule which prohibited all use of sculptures or paintings; and yet I suppose by common consent they are among the most precious relics of old times that remain in the world, and their most enduring charm is the delicate grace of all their architectural lines and details. Even in the case of a building such as Chartres Cathedral, in which sculpture and painting play a most important part, it is not in their presence or in thinking of them that the imagination is most impressed. It is probably on the exterior, in some general view of the building, that this happens. And in the interior it is when, looking down the mighty nave, we see the great columns, the vast clerestory, and the vaulted roof high above, that we feel the impressiveness of the building, and the power of the man who built it. An impression created in this way is, indeed, one of the advantages which our art possesses. She can satisfy the critical eye with beauty of detail, skill in construction, and harmony of proportions; but at the same time she appeals to a much wider world than that of connoisseurs by her ability to stir the imaginations and touch the feelings of the humblest. The means by which this is accomplished are the management of masses, of light and shade, and the intricacy or mystery of the composition. Each of these may be done in a variety of ways, and the same treatment is not available in all countries alike. In Italy and Greece, for instance, under the influence of a brilliant climate, the wall is to the architect like a canvas to the painter, on which every line may be made to tell with precision, and where even the slightest line has its proper force. In the North it is almost necessary to break this wall in order to produce the shadows. For the same reason the more you can deal with deeply-cut mouldings, the more certain you are in this climate of your effect. The primary use of them is to give the architect the power of manipulating and managing the lines of light and shade. A moulding well designed produces the required effect even when there is no sun to light it up, and it is not a little curious that England, having less sunshine probably than any other part of Europe, is the country in which the moulding of architectural features has been carried to the greatest perfection. But one of the results of having to depend on lines for effect is that with us the line is everything, whereas in Italy the wall is all in all. In the best Greek art the line and the wall surface were equally cared for. The Greek delighted above all things in making his work as distinct and clear as possible. The delicate lines of his fluted columns, the ornamented mouldings, and the clear bold relief of the statuary all show this. But the Egyptians, and after them the Italians in the Middle Ages, were happiest when the sun could play on the long unbroken front of a building as it does on the upper stage of the Ducal Palace at Venice, or on the vast and almost unbroken walls of the greater palaces and town-halls in Siena, Verona, Pisa, Florence, or Perugia.

The mystery which is so dear to the Northern mind has comparatively little power in the South. But it is a power which the English architect must know how to use. Nowhere is one more visibly impressed by this than in some of our own cathedrals, where the vast length, aided by intricacy of line, variety of detail, and skilful manipulation of light and shade, produce often most exquisite effects. A building in which the light is all equal is that in which the architectural effect is the smallest. That in which the variety of light and shade is greatest, though divided in broad and well-accentuated groups, is that in which it is best, even if its detail is not always perfect. Closely allied to the light and shade is the composition of the outline. As long as this follows a convenience or a necessity in the plan, it is more than merely justifiable; but the determination to obtain an irregular and picturesque outline at all cost is not to be commended. All good buildings teach us the importance of dominating horizontal lines. Without them there is no repose. Contrast the effect of the steep roof of a Gothic cathedral with that of a building where pinnacles rise up against the sky, and you will see how superior the former is. Westminster Abbey and Henry VII.'s Chapel are good illustrations of this. In one the vertical lines are strong as they can be; but they are controlled by the quiet horizontal line of the roof, which in the other is not allowed to produce any effect upon the design.

I have now, I think, touched on most of the principles, strictly so called, by which the good architect is bound. You see that they are many in number, but that they all resolve themselves into an observation and obedience to certain and very few first principles. The best Greek architects and sculptors were the best by universal consent that the world has ever seen, and with a few words upon their work I may well conclude this lecture. Observe, then, that their one object was to secure the utmost refinement, satisfying, at the same time, all the requirements of the best construction. They had the blessing of a sunshine which gave effect to the most delicate lines, and which allowed of their buildings being decorated with brilliancy of colour almost past belief. Nothing so well proves their extraordinary delicacy of observation as their matchless sculpture of the nude. This was the effect of study of life in active motion by the eye, rather than of merely anatomical knowledge. And all the details of Greek art seem to prove that they result from an extraordinarily patient and delicate observation of the influence and effect of light as well as of the true necessities of construction. If the same men had had to build in Northern Europe, of course they would have modified their style in endless respects to suit so different a climate. But wherever they built, it would have been as worthy of admiration as in Greece, because their work would still have been done with all their heart and all their power; and because they realised (as all of us must, if we are to be good architects) by their actions, if not consciously, that all noble ornament and all good work are an expression of man's delight in God's work, and that without the refinement which we see everywhere in nature, no work of our hands is worthy to be called a work of art.

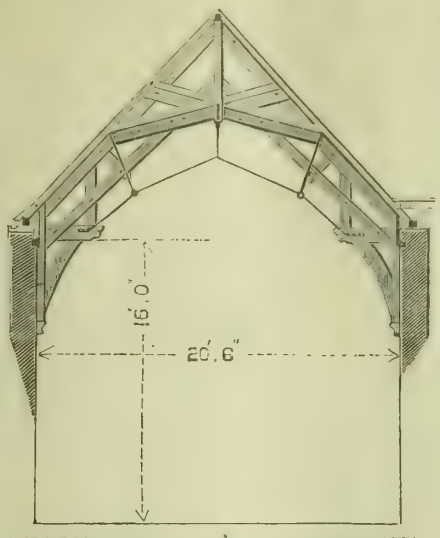
ARCHITECTURAL ASSOCIATION.

At the ordinary meeting of this association, held on Friday evening, Mr. E. B. I'Anson, vice-president, occupied the chair. It was announced that the next "visit" would be made on Saturday afternoon, the 12th inst. (to-morrow) to the Marylebone Workhouse Infirmary, erected from the designs of Messrs. H. Saxon Snell and Son.

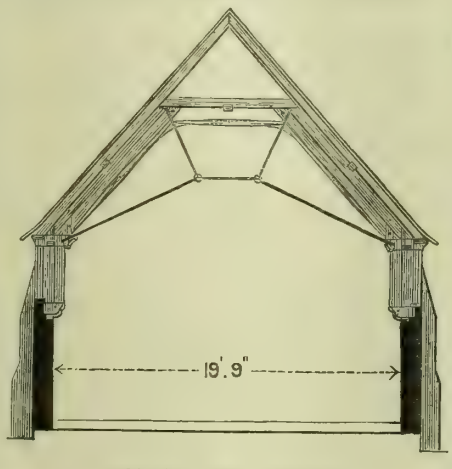
CHEAP CHURCHES.

Mr. William White, F.S.A., read a paper on this subject, illustrated by a large number of working drawings of churches of moderate cost, erected from his designs, three of which we reproduce to small scale. The author prefaced his subject by a defence of the architects who may be called upon to prepare plans of a building where the funds are extremely limited, arguing that not only is this a legitimate sphere for the exercise of his profession, but it is one needing a thorough knowledge and grasp of construction, and of the value of all available material, so as to avoid waste in convertibility, carriage, or labour. There is an economy, however, which is in danger of bringing architects' work in degradation, and these designs into discredit and even disgrace; the fictitious and delusive sort combined with superficial display, resultant from competition. To say, as has been asserted by members at the Institute, that for an architect to give in to the erection of a building with insufficient means is bringing discredit on the profession, is very like declaring that it is of no good for an employer with insufficient means to consult an architect, whereas it may be presumed that insufficiency of means may be the very reason why an architect should be called in, in order to make the most of available funds, even though to the architect it may be but a thankless and unprofitable task. Proceeding to his subject proper, Mr. White remarked that it will not do to expect the same character or the same result in a cheap church as in an expensive one. As a guiding principle, one must aim rather at giving the building a genuine character of its own, than at endeavouring to impart to it the exact character of an old building of any definite style or period, which would make it but a mean or meagre indicator of something better. Still less must there be any striving after structural decoration. It is impossible to uphold iron as the grand desideratum for cheap churches. What the author has seen of iron churches has not impressed him in their favour in respect either of comfort, of cost, or of character in proportion to the amount of accommodation provided. Whatever may be the material or the workmanship, the consideration upon which the whole basis of calculation and of treatment must depend is the superficial area or accommodation to be provided, for economy implies making the most of available space as well as of material. Proportion and relative height of building have more to do with comparative cost than is generally supposed. The popular idea that in respect of cost "style" is a more important factor than form, proportion, substance, material, construction, detail, or finish, has been a pernicious delusion. Coming more closely to the things on which cost or cheapness depends, let us first consider form and proportion. Loftiness of proportion, which is necessary to grandeur or dignity of effect, and which is at the same time a material source of costliness, is one of the first things in a design to be considered in order to keep cost within due limits. But great height is not in all cases desirable for use; as, for instance,

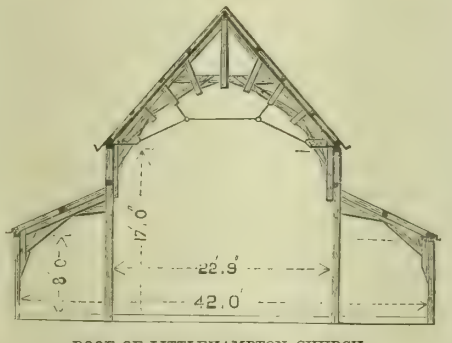
in respect of hearing, lighting, or warming; and yet it may be desirable for the sake of proportion or for cubical content of air-space. The actual or relative height of a building must depend very much on the breadth of its respective parts, and it is evident that a steep roof over a broad building must run up to a considerable height. The speaker has often been pressed to plan a building as a plain parallelogram instead of with aisles or other adjuncts—on the score of expense, amongst other considerations. He had replied that on account of cost he could not pretend to attempt it. By dividing it up into parts, the building assumes a more manageable form with respect to height. Thus, say a proposed building is to be 35 feet internal breadth in a single span. To obtain fair proportion, the walls must not be less than about 28ft. high, and with a moderately steep roof the ridge will rise to 55ft. from floor. It would be difficult to treat this, even now apparently depressed building, in such a manner as not to appear mean and bald. But divide it up, and you may have a nave 20ft. wide, and walls still 28ft. high, with the ridge 42ft. from the floor, and the whole will be of good and lofty proportions, with far more impressive effect, and subordinate aisles not unduly dwarfed. This may appear an exaggerated case, but it represents a simple illustration of the principle which the speaker had carried out. Some 14 years ago, continued Mr. White, I had the remarkable opportunity of rebuilding a modern church of about 25 years old, that of Holy Trinity, Barnstaple; it had failed partly from insecurity of foundations and partly from the great pressure of wind on an ill-constructed roof of nearly 35ft. span. I recast the design entirely, in the manner just indicated, retaining the total breadth of nearly 35ft., and height of nave-wall 28ft., but subdividing it into two aisles and a nave of 20ft. span. I have given, together with the working drawings, a diagram showing the outline of the new section relatively to that of the old. It will be seen how, with exactly the same attitude, the proportional height of nave is greater and far better than that of the old; and how the objectionable proportion of the length of rafters, which was as nearly as possible equal to the height of wall, and the general baldness of internal effect have been obviated. The cubical contents have been reduced by almost one-fourth, but the general effect of height and spaciousness is as great as before, if not greater. Apart from cost, the new building is of a form better adapted to almost all circumstances. True, there are pillars occupying a part of the available area, and to some extent forming an obstruction. But very few persons in a congregation find the interception of pillars an obstruction to hearing and seeing, so much as they do other obstructions, such as distance or accidental position, in a more spacious building. In respect of hearing, the loss would be far greater through the cubic contents being doubled, by having one large space; whilst in respect of seeing, it is equally certain that the majority of people prefer that which impresses them the most with a sense of fitness. Twenty-five years ago I had an unusual though excellent opportunity of putting to a practical test the relations of cost to the simple parallelogram and to the subdivided church, and I availed myself of it. Two outlying chapels were to be built, within a mile or two of each other, in the parish of Andover. The cost of material and labour, and other conditions, were precisely similar; the only differing circumstance being that one building at Smannel was built to accommodate 176 persons, and the other at Hatherden to accommodate 160. The larger church cost £648, and the smaller one £700, to the great surprise of the committee, who wrote immediately for an explanation of the remarkable fact, all being prepared for the reverse. The same builders were invited to tender for both churches at the same time, and I have every reason to believe that each one estimated his work for the two buildings at the same prices. That there was no vagueness in the plans or specifications was evident from the fact that the only extra in either case was the church-yard gate. In each instance the whole of the tenders were within a small range of each other, and in every case the estimate for the large church, with its arcade, aisle, and transept, was less than that for the other, which was built upon the simpler plan, in spite of the extra cost of pillars and arches. The actual outlay on the one was about £4 5s. per person, and on the other £3 10s. The larger and cheaper church is,



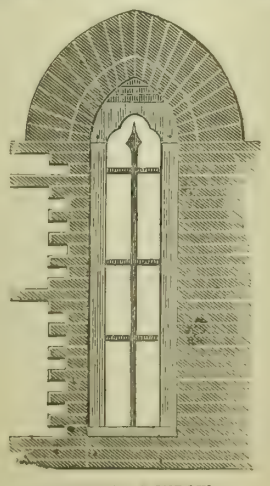
AISLE ROOF, ST. MICHAEL'S CHURCH, BATTERSEA.



ROOF OF AXFORD CHURCH.



ROOF OF LITTLEHAMPTON CHURCH.



TRIPLET WINDOW.

in my opinion, the more picturesque, and to me it has more character and suitableness for its purpose than the other, and is the one which I should prefer for my own use. Subordinate parts, moreover, afford not only additional play and feature, but seem to add size and importance to the main parts, and allow more scope for variety and design. The little chapel at New Quay, in Cornwall, was built to accommodate 180 persons, at a cost of about £680, which is slightly less in proportion than that at Smannel. Here, however, building was in some respects cheaper than in many parts of the country. I have since enlarged it to double the size, at about the same rate, by means of lengthening it, and the addition of a gabled aisle. We will now look at another church which must come under the denomination of cheap—that at Freemantle, near Southampton This church is for 940 persons, and cost £2,860—a fraction over £3 per person. It is not a church which I should like to attempt to repeat for the same money; being a permanent structure of some pretensions, and although I have been told that I ought to be ashamed of mentioning the cost, I cannot say that I am ashamed of the building itself, which has since been provided with a tower and spire, and subsequently enriched with carving. The church is built and finished with brick internally, and cased externally with Swanage-stone. The stonework of the windows is thinner than I like to have it; but the introduction of moulded bricks for labels and strings is a piece of economy well repaid in respect of colour by the result. The difficulty which necessitated the greatest care in reducing the cost to a minimum was that the whole scheme had come to a complete deadlock after eight or ten years of repeated endeavours to start it, and the successive abandonment of impracticable plans. I suppose at the present day that churches built at the cost of less than 6d. per cubic foot may fairly come under the denomination of "cheap churches." I exhibit on the walls what I have recently effected at Hanwell, at the cost of little more than 5¾d. It does not pretend to be a show church, but it is one of which no one need be ashamed, built as it has been to supply the urgent need of a poor and populous district. It is built of common stock brick, with moulded arches, jambs, and other dressings of red brick, the only stonework used being for the pillars, caps, and bases of arcades, and the tracery of windows. Here are no tile passages, but one floor of woodblocks throughout. The upper parts of walls and spandrels between arches are plastered; only chairs are at present provided, and somewhat meagre fittings. But the permanent portion of the fabric is thoroughly substantial, and all the requirements of the Societies have been fulfilled. The interior area of this building is about 5,800ft., and the accommodation being barely 10ft. super for each person is for 600 people, according to the plan, at a cost of just over £4,000—of course, without the steeple. An excellent church, by Mr. Cutts, in North Kensington,* has been deservedly well spoken of as accommodating 750 persons, at a cost of £5,000. This happens to be within a fraction of the same cost proportionately as the church at Hanwell. But I have just commenced a cheap mission church at St. Michael's, Wandsworth-road, Battersea, which, with an equal accommodation, comes to nearly £1,000 less, when the cost of the crypt suggested by the fall in level of ground is taken into account. The price per cubic foot is about the same; but the church is an illustration of what may be done in respect of total cost by reducing the height, and consequently the cubic contents, by economising the construction. The result remains yet to be seen. It would, however, in any case fulfil the requirement for which it is erected. Here I have had recourse to wide aisles without a proper clerestory, but with wooden dormer windows in lieu of it. The tenders for this were all within £200 of each other, so that the amount is freely to be relied upon. None of these, however, touch the even yet more difficult question of cheap and temporary mission churches. For these we must look beyond and beneath the range of what we have been discussing. In addition to considerations of form and proportion, we have to fall back still further upon substance and structure. A thin wall implies economy by a reduced amount of roofing to cover it, and a reduced total of cubical content. I have spoken depreciatingly of iron. The iron church at Battersea-rise was reconstructed at Night-

* Illustrated in the Building News for August 23, 1878, by perspective and ground plan.

ingale-lane. Its accommodation was for 400 persons. It cost originally £1,600, or £4 per sitting. Its temporary removal on to another part of the same site during the erection of the permanent church cost £500; its subsequent removal and re-erection in Nightingale-lane again cost £500. That at St. Michael's, Wandsworth-common, accommodating about 130 persons, at the rate of 8ft. super for each, would have cost for removal on the same site £130. I have found the cheapest and best materials for such purposes to be wood-framing, covered inside and out with lath and plaster, and roofed with felt or boarding. It may be well, however, if it should be desired to give it a little more permanency, to cover with pantiles or slates on the roof and upper parts of gables or walls, especially in exposed situations. The mission church of St. John, at Littlehampton, is constructed in this manner. The first contract, for the accommodation of 210 persons, according to the usual standard of church-building societies, though of course not in accordance with their requirements for a permanent building, was under £650, or a little over £3 per person—again at the rate of 8ft. super. Slating, and some stiffening of the timbers, added £50 to the cost. Additional room for nearly 80 persons has now been provided for £200 by an aisle on the south side, the rate being £2 10s. each. The site is not freehold, and I have detached the structure by laying the wood sills on a strip of felt without any mortar bed. Here, again, I have adopted the principle of the clerestory, which is carried upon wood posts, with low aisles. The roof was to have been covered with iron and a thin course of concrete. This was changed to slates. It is ceiled with deal boarding to follow the lines of back of principals, which are laminated, of three boards one inch thick, nailed and bolted. The roof is tied with iron rods and braces. The wood supports, only 6in. by 6in., and 17ft. high, were found insufficient to stand the rocking of the wind, and were strengthened with pieces bolted to them. The building depends for its effect, which is quite church-like, wholly upon the general proportion, form, and arrangements. There is no detail in the ordinary sense of the term, and it has no pretension to more than it really is—a cheap but thoroughly usable and ecclesiastical building. A class-room and various extraneous appliances have been added, which are not included in the statement of cost. In a somewhat similar building in Park-road, Brighton, but with external brick walls, I provided, as here, wooden posts and a wooden clerestory. A better and more permanent construction was desired, and the builder proposed cast-iron pillars and 9-inch arches for the arcades. I found, however, that at a considerable saving, and at a vast improvement to the building, we were able to adopt stone caps and bases, 9in. stone shafts instead of iron, and an arcade of 14in. work instead of 9in. This building, 80ft. by 40ft., affords accommodation for 400 persons, at a cost of about £2,000, or nearly £5 per person, at 8ft. each. The chapel of Axford, near Hungerford, was a marvel of cheapness, and perhaps may be thought to tell against the principle which I have laid down. It is a plain parallelogram accommodating, at the rate of 7ft. super. each person, 153 persons, for about £425, or less than £3 each person; it is built of flint and brick, and covered with slates. It has a well-pitched roof, and the walls are 10ft. high, with wooden windows. Now, I had here to put into better shape without increase of cost, a design already contracted for by a local builder from a local plan. Some increase of cost was necessitated by a lengthening of the building, which according to the first plan was not large enough, by about one-sixth, to accommodate the number of persons for whom it was supposed to be erected. In dealing with it I had to raise the pitch of roof considerably, and I lowered the walls by 2ft.: but had the building been proposed for 300 or 400 instead of 150, the treatment of it must have been very different, and very much more difficult to deal with at the same rate of cost, in order to obtain anything like a fair proportion. My treatment did not add to the cost beyond the addition of the one-sixth of increased area already referred to, which brought up the accommodation from 132 to 153, and the builder's tender from £363 to £423 10s. In conclusion, Mr. White said: Let our uncostly works bear upon their face the evidences of their uncostliness. Let them not be decked out in structural finery to which they are not entitled, and then let us comfort ourselves under all criticism that we have done better than our severest critics could have done under similar circumstances. You may be inclined to think I have said and done far too much on behalf of cheap churches, but pray do not go away with the idea that we ought to be content with an inexpensive makeshift building. Do not listen for a moment to the popular cry "Why all this waste upon splendid and beautiful buildings when so many are destitute of any description or even of healthy homes?" Without the self-sacrifice of the rich, without indulgence in ecclesiastical architecture, or in high art for the benefit of others, nine-tenths of the amount which had been spent in impoverished districts would never have been expended; the greater need would never have been felt and never supplied. A cheap building is often a necessary evil, a mere substitute for something better, which may, and sometimes does, stand in the way of what might be of a higher and more permanent character. But it is in one sense a school of art. It teaches us the best, the most natural, the most simple modes of construction, and fits us for the better use of our higher opportunities. Let us not, then, despise small things; but let us rather aim at making small things great by our care and diligent use of them, knowing this to be our most important element in ultimate success.—A short discussion ensued, in which Mr. Aston Webb, the Rev. Mr. Blakiston, secretary of the Incorporated Church Building Society; Archdeacon White, Mr. Pratt, and others took part, and a vote of thanks was accorded to Mr. White for his paper.

MEASURERS: THEIR POSITION AND PRACTICE.*

By Robert Scott.

MEASURING as a distinct profession was first practised in Glasgow about the beginning of the present century. On 2nd March, 1815, "rules and regulations for measuring mason work" were sanctioned by decree of the Dean of Guild Court of Glasgow by this decree: "The Dean of Guild and his brethren of Council, ordain and direct that the same shall be strictly observed in time coming by *all measurers of mason work* within this city and liberties." In 1825 there were seven firms practising measuring in Glasgow as a distinct profession, and one firm who practised as architects and measurers conjointly. Now there are, according to the directory for 1880-81, no fewer than forty firms in practice as measurers in Glasgow, and it is a noteworthy fact that the ratio of architects practising as measurers is less than in 1825. In defining the position of measurers, I propose to consider their relation to architects and contractors, also their duties and powers under the contract. As practised in Glasgow the office of measurer is distinct from that of the architect, although there are a few architects who combine measuring with their other and proper work; and it should be distinct, as under the system of re-measurements which obtains in Glagow, the offices of architect and measurer cannot both be legitimately practised on the same occasion by one person, which will be quite apparent when it is considered that the architect is the representative or agent acting for behoof and in the interest of the proprietor, and it would be quite reasonable on the part of the contractor to decline to accept of a measurement prepared by the architect, and such non-acceptance would not necessarily be any reflection on the honour of the architect. Of course, in cases where the contract is a slump sum, and the quantities taken out by the architect, the evil is not so great, as the contractor may have an opportunity of satisfying himself as to the accuracy of the quantities, and if he has no such opportunity he can always add a sum to his offer sufficient to give him a safe margin to work on. Although the office of the measurer is distinct from that of the architect, they are still so closely connected, the first stage of the work of the one being the interpretation of the work of the other, that the measurer must co-operate, and when there is no detailed specification, have personal intercourse with the architect in the preparation of the schedule or estimate, which usually contains the sole specification of the work, as well as the quantities of the various kinds of materials and workmanship, as measured from the plans, to the extent that he must give effect to the instructions of the architect in regard to the nature of the materials to be used and the kind of workmanship required in the execution of the various parts, even to the minutest detail, and append to the schedule such conditions of contract as the architect may deem necessary or expedient in the particular circumstances under which each building is erected. It is indispensable that the measurer should in these matters be subject to the control of the architect, as it is not otherwise possible for him to prepare such a schedule of quantities with specification as would be a fair interpretation of the most complete set of drawings, and necessary for the realisation of their author's conception; and this co-operation and intercourse is increased when, as frequently happens, the architect is so pressed by the proprietor that he does not get sufficient time to mature and complete his plans, and they are put into the measurer's hands in such a crude state, that without verbal explanation they would not be intelligible. The measurer is entitled to prepare the schedule of quantities, according to the particular mode of measurement which prevails in the locality where he practises, as, for instance, we have in Glasgow and neighbourhood what is termed the "Glasgow mode of measurement," and that without any interference on the part of architect or proprietor. I have endeavoured to state what should be the proper relation between the measurer and the architect in the preparation of the schedule of quantities or estimate, and to what extent the measurer is subject to the control of the architect: I use the word control advisedly, as it has been claimed, and that without definition or explanation, that "the measurer should be under the control of the architect," and it is of no small importance to the measurer to understand exactly to what extent it is safe for him, in the exercise of his professional functions, to submit to the control of either the architect or contractor, so that he may not be embarrassed in the impartial and just performance of his duties, and that he may escape the odium of being designated either the creature of the architect or the clerk of the builder. The schedules having been issued to contractors, offers received, and contracts duly entered into, the measurer's position is essentially that of strict neutrality between proprietor and contractor, and requires that he shall perform his work of re-measurement with integrity, impartiality, and accuracy, according to the principles and spirit of the schedule which is the basis of contract; taking his measurements at such times as may be necessary for his proper examining of the work, and completing his measurements within a reasonable time after the building is finished. With regard to the application of the schedule or contract prices to the after-measurement of the work, it is the duty and within the powers of the measurer to apply the contract prices to all items of work which have been executed in strict accordance with the description in schedule, and to apply proportionate prices to such items as have been increased or modified, either as regards material or labour; but in the event, and it frequently happens to some extent, of there being extra work executed, for which prices cannot be deduced from the contract prices, it is not within the power of the measurer to price them, unless, as in exceptional cases, the contract stipulates that they are to be priced by him, and so it is customary for such items to be priced by the contractor. As the measurer usually examines these prices for extra work before filling them into his measurement, which is done in either blue or red ink, to distinguish them from prices which are taken from the contract, it is customary for him, when he considers these prices disproportionate to the current value of the work, to advise the contractor to that effect, and, if possible, have them so far corrected, but not finally adjusted, as the advising by the measurer is altogether gratuitous, and can in no way impair or affect the right of either the architect or proprietor to examine the extra prices and reject such of them as may be considered exorbitant. It is sometimes the complaint of contractors that measurers reduce the prices filled in by them for extra work without their knowledge or consent, and when this is

* Read before the Architectural Section of the Philosophical Society of Glasgow.

done they have just cause for complaint, as the measurer who thus acts is not only discourteous to the contractor, but arrogates to himself a position which is neither tenable nor desirable. On the other hand, the contractor is not entitled to assume that the measurer, by filling in these extra prices into the measurement, thereby corroborates them, as it is often the case that the measurer puts in those prices even when he considers them exorbitant, and if he were to act otherwise he would debar the contractor from his opportunity of making what seems to him a fair claim, and one which both architect and proprietor have a right to refuse should it not be so. The measurer having allowed the contractor to make his claim for extra work, or having unwarrantably reduced the prices for such work, and the architect or proprietor having judged the prices in either case as overcharged, and refused to admit the claim to the extent of the alleged overcharge, there thus arises a state of matters for which very few contracts provide a method of settlement, and which is sufficient to furnish a cause for tedious, irritating, and expensive litigation. The few appeals which have been made to the law-courts by the contractors of Glasgow and neighbourhood speak volumes for the fair dealing and good feeling which exist between them and the architects; but however successful they may have been in settling these differences in the past, it would be well to provide in the contract an arbiter who has a knowledge of the work and commands public confidence, to whom appeal could be made; as sometimes the settlements are only amicable in appearance, the contractor often submitting to the reductions made rather than have the anxiety and trouble connected with a lawsuit, get the name of being litigious, and lose the patronage of the particular architect concerned. It is acknowledged by the measurers of Glasgow that the architects and contractors respect their distinct status as a profession, leave them free and untrammelled in their work, and treat them in the most courteous and considerate manner. In treating of the practice of measurers, I will first take up the mode of measurement, and afterwards make a few remarks on some points affecting their relation to one another, and the maintenance of their status as a distinct and honourable profession. In regard to the mode of measurement, it was stated in a paper read before the Glasgow Architectural Society 19 years ago, that "it was commonly remarked that tradesmen must know the measurer before they could know the mode of measurement," and unfortunately, the same statement can be reiterated now with as much, if not more, accuracy than at that time. Although the expression "Glasgow mode of measurement" is so familiar, it is an astonishing fact, and one very humbling to the measuring profession, that it is only for the measuring of mason work that there are formulated rules and regulations, and for them we are indebted to the Incorporation of Masons and the Dean of Guild Court of Glasgow as constituted in the year 1815; and that rules and regulations for the other departments of the work have never yet been framed; and so it is no wonder that there is a want of uniformity in practice, as there are measurers practising in Glasgow who have only the memory or memoranda of their observations of their apprentice-master to control them, and even feel at liberty to depart from his example in the belief that they have no law to observe, but are a law unto themselves. Although the rules and regulations for measuring mason work, sanctioned in 1815, were both simple and comprehensive, were published under the auspices of the Dean of Guild Court and the Incorporation of Masons, and possessed so much intrinsic merit that they have formed the basis of the latest approved rules and regulations; yet, they seem to have been disregarded to such an extent that "in 1840 great inconvenience was felt in Glasgow and neighbourhood from the want of a general and uniform mode of measuring mason work" and a meeting of the architects, measurers, builders, and Incorporation of Masons, convened by circular was held, at which a committee was appointed, who drew up an entire new set of rules and regulations, which were unanimously approved of and adopted at another general meeting to which the committee reported, and were printed and circulated as "Rules and Regulations for the Measurement of Mason Work in Glasgow and Neighbourhood." An effort to amend these rules and regulations was made in 1858, but, from some misunderstanding, came to an untimely end, and not having been resuscitated, there has been no revisal of the rules since 1840, although the necessity for such revisal has been very much felt. It may be interesting to examine the more important and general principles laid down in these rules, point out some of the departures from their precepts, and indicate which of the many and varied substitutes are worthy of being adopted as improvements, and fitted to bring them into harmony with the spirit of the age. They direct, that buildings of every description shall first be measured net as ruble, the daylight size of apertures being deducted, whether arched or otherwise; no allowance to be made for levellings; projections of running cornices, mouldings, and belts reduced to the thickness of the walls with which they are connected; scuncheons of through openings to be charged by the superficial yard, and levellings for bond timbers to be charged separately. The standard thickness of walls remains as stated in rules of 1815. All hewn work to be charged for its additional value over the price of ruble. Rustic work to have its channels girded into the bottom. Columns, pillars, buttresses, and similar work, where heavy materials are used, to be taken by the cubic foot, and where not measured as ruble, the prices shall include building, the hewing being afterwards measured for labour only. All plain ashlar, rybats, sills, and lintels to be measured by the superficial foot. Window and door architraves to be girded and taken by the superficial foot; or to be by the lineal foot, stating the girth. Cornices and running mouldings to be measured at the extreme points for the length, and girded across including the upper bed to the line of wall as moulded work, and reported by the superficial foot. Stair steps and platts to be rated by the superficial foot, and measured clear of walls. The departures that have been made from these rules are so numerous, that those who have schedules passing through their hands and examine them as to the mode of measurement, will find it hard to believe that such rules are in existence, and will see the propriety of the mode of measurement being distinctly specified in every schedule of mason work, and they will also find sufficient justification for the remark that "Tradesmen must know the measurer before they can know the mode of measurement." A departure has been made from the rule that all building shall be first measured as ruble work, in so far as all die walls, pedestals, and parapet walls composed of one stone only in thickness; also chimney stalks are not usually measured for ruble; but are described and rated to include building, and such departure simplifies the pricing of such items, as the contractor can at once determine the cost of the building of same, which is quite a different class of work from the building of hewn work into a ruble wall. In deducting arched apertures from ruble work, some take the height to spring of arch only, which is according to the rules of 1815; but this method cannot be commended, as it would take a very astute contractor or measurer to calculate how many shillings less per rod the work would cost on account of this extraordinary allowance. In measuring rustic work, some observe the rule by girding the channels in the bottom, while others measure over, but not into the channels, and then measure the channels separately by the lineal foot; the latter method is preferable, as it takes the work as it is actually executed, and suits for any kind of channel, whereas the former is liable to give the least allowance in measurement where the channel is most elaborate and difficult to work. Plain sills and lintels in ashlar walls are sometimes measured as extra over ashlar, and sometimes as extra over ruble, in which case they are deducted from the ashlar; the former mode is objectionable, on account of its liability to mislead in pricing, seeing there is the general rule for hewn work to be charged for extra value over ruble, and it is desirable to have as few exceptions to general principles as possible. In measuring the hewn work of cornices for labour only, where the stone has been taken by itself, some have separated the moulded hewing of front and soffit from the weathered hewing of top bed, and it is a deviation which will commend itself to the practised and unpractised alike, as it is absurd to measure as a unity things which differ so much in cost of production. In specifying cube material it is well to state the cubic content of each stone, if exceeding 15 cubic feet, and where they do not come under the note in price list, viz., "length not to exceed twice the breadth nor breadth twice the thickness," to give the specific sizes; as these particulars enable tradesmen to ascertain at once what the cost of the stone will be; and care should be taken not to measure stones by the cubic foot, which do not fall under that class in the quarry price list—for example, the stones in the upper and lower leaves of a main cornice, which may be only 7 or 8in. thick, are sometimes taken by the cubic foot when they are what are designated broad stones and are sold by the superficial foot: of course an intelligent offerer can calculate the price per cubic foot from the rate per superficial foot, if he is furnished with particulars of the thickness, breadth, and approximate length of stones required; but he may be saved this abstruse calculation by the measurer reporting such stones by the superficial foot, which he can do without additional labour. The difference in the cost of cube and broad stones is so great that where a cube stone containing under 20 cubic feet would cost 1s. 4d. per cubic foot, a broad stone 8in. thick and of the same cubic content will cost 4s. per cubic foot. A very important point in the specifying of cube material is to give the thickness or height of the stones, seeing that the common practice is to describe it so that the price shall include the dressing of beds; as in the case of ordinary piers of a shop-front, there may be only 1ft. of dressing to 2 cubic feet of material. In piers built in courses 1ft. high there is 4ft. of dressing to 2 cubic feet, and in the event of broad stones 8in. thick being measured as cube, there is 6ft. of dressing to 2 cubic feet. It is now the general practice to number stair-steps, stating length clear of wallhold and description of labour, in place of measuring them by the superficial foot; and some also deviate from the rules by measuring stair platts the full size including wallholds, as they consider it entirely misleading to state the superficial content of a platt which is 5ft. by 4ft. clear at 20 superficial feet, when with 9in. wallholds on two sides it requires a stone containing over 27 superficial feet, and costing more per foot than one of 20ft; and it also relieves an unscrupulous contractor from the temptation to scamp the work by giving the platt an insufficient wallhold. Having dwelt at such length on the measuring of mason work, which is the most important of all the departments of building, I propose to make a few remarks on the measuring of the other departments for which there are recognised but unwritten rules; and first in order comes brickwork. There are three modes practised in measuring brickwork. (1) There is the mode under which openings are not deducted; (2) that under which the openings are deducted less one scuncheon in width; and (3) that under which the work is measured *net*, and all plumbings, and such like, taken separately for extra labour. The first of these modes is so devoid of the principle of fairness that it is surprising that it should not have disappeared along with the similar mode which once prevailed in measuring mason-work, and it is a most extraordinary thing that it finds more favour in the eyes of contractors than either of the other two modes; while, if it be admitted that the amount of work executed oftener exceeds than falls short of the quantity estimated, it operates oftener against the contractor than in his favour. The second of these modes, viz., that under which the breadth of one scuncheon measured as solid work is allowed for the plumbing of two scuncheons, is likewise objectionable. What is its effects? Suppose, for the simplicity of calculation, an opening 13ft., and the allowance for plumbing the scuncheons at such an opening in 9in. wall to be 3s., at an opening of the same height in an 18in. wall, where the labour is less than the double, the allowance will be almost, if not altogether, four times the amount of that in the 9in. wall—viz., 12s. The third mode—viz., net measurement for brickwork, with the plumbings and such like measured separately for labour only, is the only method which is worthy of being practised by measurers, whose endeavour it is to make their measurements an exact representation of the work executed, and this is the mode that is prevailing over all others. In the measuring of carpenter and joiner work there are a great many conventional allowances given, and it is not usual to specify the extent of the allowances in the schedules for the work, so that the contractor has to take the risk of getting more or less according to the usual practice of the particular measurer who may happen to have the work in hand. Although

these allowances are merely matters of tradition, it is astonishing that they are so generally adhered to in practice; but still there are some differences; as, for instance, I have heard of cases where 3in. was allowed for angle cutting on lath, whereas 6in. is the allowance generally made, and I have been informed that sometimes there is no allowance made for angle cutting on deafening boarding.

The measuring of joisting has recently been a matter of public discussion, and certainly calls for adjustment; but if the present method, which is almost uniformly adopted, is to be altered, the alteration must be effected with general consent, as it will only make confusion worse confounded for a few measurers to adopt a different method at their own hand. The present method of measuring joisting which is placed 18in. centre to centre by the square yard, by taking the net inside length of the building by the full length of the joist, seems to have arisen from the recently prevalent practice of measuring joisting and flooring together, which is gradually and happily being departed from, as the allowing of a quantity of flooring of the value of, let us say, 1s. 6d. per square yard, for an equal quantity of joisting of the value of, say, 3s. per square yard, could not be considered either fair or reasonable; and it would be utterly impossible without the exact dimensions of the building being stated, to calculate what percentage additional should be put on the cumulo price to cover the loss that would be entailed by this method. There is no doubt that the measuring of joisting, as before stated, does not give the proper quantity in square yards, calculating 6 lineal feet to the square yard, as in a building 36ft. long, where the length of joist is 25ft., the mode of measurement practised would give the quantity of joisting at 100 square yards, whereas, calculating 6ft. to the square yard, the quantity would be 104⅙ square yards or 4⅙ per cent. more, which percentage the contractor, under the present system of measurement, must be held to put on the price. The allowance of one edge in the breadth and height of bound doors is also worthy of consideration, as it does not give equal or proportionate value for cleaning edges and fitting doors, for one door may be priced at 18s. per square yard and another door at 9s. per square yard, and thus the allowance in value is double in one case what it is in the other, while the labour for which the allowance is made may be the same in both cases; such allowances might be dispensed with and a charge per door made for fitting. Again, the mitring of bases and skirtings is a cause of complaint with the joiners, and it would be a decided improvement were mitres to be numbered, and such a method would only be fair and reasonable, and could not be looked upon as a concession wholly in favour of contractors, as it would deprive some of them, who, instead of mitring the skirtings to the window and door facings, put in base blocks, for which they get a separate item, while they are saved the labour of mitring. In the measuring of slater work there is not much scope for variation, and yet there is often unpleasantness arising about the deduction of windows and other points, on account of the generally recognised rules being still unwritten. The allowances presently given at eaves, valleys and piends are worthy of reconsideration; in fact, it would be well that the present system of including these allowances in the quantity of work should be given up, and that the several cuttings be stated separately by the lineal yard, as the value of such allowances varies with the different classes of slates; and with the best slates, where the value of the allowances is greatest, there is the minimum of extra labour and waste of material. In measuring plumber work there are, generally speaking, no allowances made, so that any differences that exist in practice are merely in the classification of the work. It might be both interesting, wholesome, and beneficial to the whole plumber trade, if the quantity of lead were sometimes ascertained by the use of scales and standard weights, in place of by tape line, foot-rule, and gauge, as it is not easy for one not up to the business to understand how work can sometimes be executed at the market price of the material. The measuring of plaster work and painting does not require much comment, the work being so much of a superficial nature that there are very few allowances required, and consequently the mode of measuring is much more uniform than in the more complex departments of work. In plaster work the allowance of one foot for each extra mitre on a cornice or moulding, seems a very arbitrary method of fixing the value of the extra labour required in its formation, and it would be much more satisfactory and reasonable to enumerate all mitres, intersections, and butt joints, so that they could be priced at their fair value, and would, at the same time, give the contractor, when offering for the work, a correct idea of the average length of stretches in which cornices and mouldings could be run, and such information would be an important factor in his calculations as to the price required for the work. It will be readily judged, from the foregoing remarks on the practice of measurers in regard to the modes of measuring the several departments of work, that each measurer has little or no relation with any other, and that there is uniformity, even to a limited degree, in their practice, can only be accounted for by the fact that all the measurers presently practising in Glasgow, have been trained in the offices of a very few firms, or by those who came out of these offices. But as the members of the profession have now increased numerically beyond the limits of a family circle, the variations in practice will also increase and lead to such confusion as will greatly deteriorate our usefulness as a profession. Nor should competition, however keen, provided it is straightforward and honourable, be a bar to our good relations one with another. It is not so in other professions or trades, who have their faculties, institutes, and associations, and we have evidence of this before us every day. We know how keenly all tradesmen compete with one another, and it is also within our knowledge that they fraternise and make common cause in the interests of their trade; and this same kindred feeling is not foreign to other professions, and why should it be to ours? It is to be feared that there are some who adopt practices, in order to secure work, which are neither honourable, legal, nor moral, and which will certainly bring their due reward to those who adopt them. For, how can a proprietor have confidence in a measurer who enters into an agreement with him to manipulate his fees, so that the proprietor's share will only be ⅓ or ½ of the whole expense, or perhaps nothing, in the face of the clause that "the contractor to pay one-half expense of measurements and schedules," and, inferentially, the proprietor will pay the other half. It seems the very height of folly for a measurer to offer such terms, and for a proprietor to accept of them; for by what process of reasoning can the one persuade the other that the manipulation of a measurement will only begin when the last item has been reached, and that manipulation arranged for before the work is in hand. The man who could so act in his relations with one party cannot expect but that that party will suspect him of entering into similar arrangements with others, for the purpose of defrauding him. It has been asked, Can a measurer not make any arrangement he pleases with a proprietor, provided the contractor is not charged more than the half of a fair fee? I answer "Yes and No." He may, if he states in the schedule what the amount of the fee is that the contractor is to pay the half of, for then the contractor knows what he has to pay, and can make provision for such a deduction off his prices. But if he only puts in the usual clause that the contractor is to pay one half of fee, then that must be understood to mean one half of a fair and reasonable fee; and the amount actually received by the measurer is the fair and reasonable fee in the circumstances. The pricing of schedules by measurers for contractors is a part of their practice which is of a very questionable nature, as it must be supposed that measurers get their knowledge of prices from offers which are placed in their hands for a specific purpose, and to give the use of the prices in these offers to other and competing tradesmen does not fall short of a breach of confidence, and is unfair to the contractor who has ascertained the value of work from his practical knowledge of its execution; and sometimes enables men, who know little or nothing of work, to take contracts out of the hands of the practised and skilled tradesman. And it is advisable that measurers should take nothing whatever to do with the making up of offers for work, the measuring of which is in their own hands. There is one other matter which has a baneful effect on the measuring profession, and that is the number of apprentices taken into our offices, and that sometimes without any regard to their general fitness for their work; and the result is that many spend what is the best training-time of their life at a profession for which they have neither liking nor capability; and whenever they attain the age that they require a salary sufficient to maintain them, they are set adrift to make room for more apprentices, and left to look out for some other calling which shall suit their peculiar tastes and abilities, and that at a time when their minds are naturally not so susceptible and may have been dulled by seven or eight years of drudgery work in a measurer's office; and no doubt the system of attempting to do all work by apprentices, and dispensing with the services of efficient clerks and assistants, tells on the reputation of the profession, as it will be readily admitted that a slovenly or badly written document, with all sorts of interlineations and erasures, is quite sufficient to deprive the most carefully drafted schedule or measurement of the confidence of both contractors, architects, and proprietors. I will now draw these, perhaps unduly extended, remarks to a close by endeavouring to answer one question, viz.—How are measurers to retain their status as a profession? Their status can only be retained by union and co-operation, in short, by the formation of a Measurers' Association; as without such it is impossible to have any approach to uniformity in the mode of measurement or attempt to reform any of the evils referred to in the foregoing remarks. In revising, amending or framing rules for measuring any department of work it will only make matters worse for any one to act individually, and having to confer with architects and contractors in their corporate capacity, the measurers must meet them in a similar capacity, otherwise they cannot and are not entitled to be heard. A Measurers' Association! what good will it do? some will say; well, if it does nothing more than settle the comparatively few questions now raised, it will do a good, needful, and beneficial work. Such an association can be formed more readily now than it will be in the future, as the difficulties will increase with the number of practitioners, and the basis will require to be broad enough to comprehend all those who are entitled to practise. What is to hinder the leading members of the profession to arrange for a general meeting of measurers in the City, to consider the propriety of forming a Measurers' Association? Nothing; everything is in favour of such a step being taken; the association of master slaters is already preparing to meet us to consider some questions in regard to the mode of measuring; the master masons have been waiting for a conference since 1858, and are now resolved to do their utmost to have a new and uniform mode of measurement; and the other trades' associations will be sure to follow suit; and last of all the members of the Institute of Architects, if not in a corporate capacity, at least individually, are loud in their condemnation of the present unsatisfactory state of matters, and may very soon take action to set matters right. I shall not presume, in the presence of so many of my seniors, to take the responsibility of the initiative step, but I trust some such steps as have been indicated shall be taken, and that none will hold back until they see what kind of association can be formed, and then consider whether they shall join it or not, but that all will come forward and assist in making it such an association as will be a credit to the profession, able to deal with all questions affecting its interests and enjoy the confidence of all kindred institutes and associations.

RIVER-BARS.*

A SMALL octavo volume, written by Mr. T. J. Mann, the Assistant-Engineer to the Dublin Port and Docks Board, a portion of which has appeared in *Engineering*, contributes some useful facts on the causes of river-bars and their treatment by induced tidal scour. Mr. Mann chiefly draws attention to the means which have been adopted in Dublin Bay to reduce the bar near

* River Bars: Notes on their Formation and Treatment, &c. By T. J. Mann, Assistant-Engineer to the Dublin Port and Docks Board. London: Crosby Lockwood and Co.

the entrance to the Liffey, and his own investigations into the formation and removal of the bar appear to corroborate certain views very substantially. The gradual reduction of the bar at Dublin Bay has been a work of time, and forms, as the author observes, one of the most remarkable in the history of harbour improvement. Two extensive sand-banks, called respectively the North and South Bull, are formed at the western extremity of the bay, and it is through these the Liffey discharges itself. In 1748 the great south wall was commenced, and carried in an easterly direction for about one and a-half miles, terminating at the Pigeon House fort. The cross-section furnished of this wall shows it to be from 37ft. to 48ft. wide. It consists of two parallel rubble walls, the space between being filled up with sand. This wall has had a beneficial effect, by protecting the river from the encroachment of one of the sand banks, but chiefly by confining the currents of the ebb and flow to a certain channel, has produced a tidal scour, which has directly led to good results. These are specified in detail by Mr. Mann, who enters into the various schemes, proposed, among them those of Sir Thos. Hyde, Page, Rennie, Bligh, Corneille, and other eminent engineers. The great north wall, of rough rubble stones, was ultimately formed, the stones were deposited so as to form a rubble mound, and made to find their own foundation. By reference to the charts and sections given by Mr. Mann, it is seen what effect these walls have had in inducing scour and so removing the bar. An increase in the depth of channel amounting to 20ft. in some parts has been the result. As regards the formation of the bar, the author attributes it to the "combined action of waves and the current of the flood tide," the former stirring up the fine sand of which the bottom of the bay is composed, and the latter carrying it along and heaping it up.

The author does not confine his book to a descriptive account of the treatment adopted at Dublin Bay, but enters into the theories which have been advanced for bar-formation. These are discussed in the earlier chapters of the book, and give a somewhat more permanent value to it. The author seems to support the view that bars are sometimes formed by wave-action alone, and evidence is brought forward which appears to confirm this view. The tendency of waves is to move sand towards a coast, simply because the effect of on-shore winds are not counteracted, and of course accumulation takes place. The artificial expedients that have been proposed to produce agitation at the bottom by stirring up the sand while the ebb tide is running over the shoal, are described, and the bars of the Rhone and other great rivers are mentioned to show what has already been accomplished in reducing bars. The conclusions drawn from the observations of the La Plata and Parana rivers, given by Mr. J. J. Revy in his "Hydraulics of Great Rivers" are quoted by the author, who thinks with some show of reason that the same laws hold in the case of tidal estuaries. As the scour is able to commence the deepening process, it is only reasonable to conclude that, in the absence of a modifying force, the deepening will continue. The chapters on "wave action," "currents and scour," contain a résumé of many leading opinions, and are interesting on that account alone; while the author brings evidence to show how conflicting some of these opinions are, as for instance the effect of wave action on the bottom of rivers. That wave-action is an agent in the production of sandbanks and shoals, there can be little doubt; and the author believes that in shallow waters wind-waves produce considerable effects, and should be taken into account in the design of works for the purpose of removing bars. The book has been well printed, and will be found a practical guide to those engaged in the improvement of rivers and harbours. Its author has been successful in bringing undoubted evidence forward to prove the value of tidal scour as an economical agency in such works.

PROFESSOR NEWTON ON GREEK ART.

"THE Frieze of the Parthenon" formed the subject of the fifth of the course of lectures on Greek Art in the Age of Pericles, by Professor C. T. Newton, C.B., and was delivered in the theatre at University College, on Friday afternoon. On the walls were hung a series of drawings, to a reduced scale, of the sculptures of this frieze, as they at present exist in the Elgin Gallery of the British Museum, and a few illustrations of horses and their riders, drawn to full size. The lecturer spoke in eulogistic terms of the manner in which the sculptor Phidias had overcome the difficulties, not only of the actual material, white marble, in which he wrought, but those inherent to an endeavour to combine on one plane, and in exceedingly low relief, representations of the poetic ideal and of actual daily life, of the visible and the supernatural. This frieze passed completely round the four outer sides of the building, within the range of columns, but at a high level; the subject was a procession, or rather two processions, starting from the south-west angle and arriving at a climax on the east front. Taking the northern and longest line of figures, the one which happened to be the less mutilated of the two, they saw the subject was opened with groups of men controlling and mounting spirited horses; then followed a tumultuous throng of riders, which gradually resolved itself into a cavalcade, succeeded by groups of chariots, with horses, first restive and then quietly proceeding, groups of men on foot, carrying various articles, oxen and sheep, women bearing various vessels. This order was followed on the southern side, both processions leading up, as the angles of the east front were turned, to a group of aged men on either side, to six seated figures, male and female figures standing, and in the centre a group of four standing figures, one of whom was handing and another receiving a folded fabric. What was the meaning intended to be conveyed by these groups? The idea originally propounded by Stuart and Revett was that this represented the Pan-Athenaic festival, and this conjecture seemed incontrovertible. Having sketched the progress of the festival, Mr. Newton reminded his auditors that it culminated once in five years in the public presentation to the chryselephantine statue of Athené in the Parthenon of a peplos, or veil, which had been embroidered in the interval since the preceding great festival by the principal maidens of Athens. This afforded a key for the interpretation of the sculpture, which he would proceed to apply. Returning to the south-west angle, they saw the noble youths of Athens preparing to take part in the great procession, first in the act of securing and mounting their horses, and then falling into the line, as an honorary armed escort to protect the treasures which were exposed to view on this occasion. Phidias overcame the danger of monotonous treatment of this part of the procession by giving varied attitudes to the horses, and by selecting typical portions of the clothing worn by the young aristocracy, putting some in armour, others in ordinary costume, others again as unclad, except by the robe which streamed behind them in the wind; had Phidias been an Assyrian artist, he could have faithfully carved every detail, but being a Greek, he studiously strove to give variety. In the south-side procession the young nobles were replaced by the regular troops. Next they had eight or ten chariots, which took part in the contests on this occasion; these were greatly mutilated, but enough remained on the two sides to show that at the rear the horses were rearing up, and were being restrained by attendants, but that as the head of the procession was reached the action was more restrained. There appeared to be an endeavour to suggest some of the games, including that of armed men leaping into a swiftly-moving chariot, and the armed warrior seated beside the charioteer. In front of these were the thallophori, men who had passed the age of military service, but were permitted to carry boughs in this procession; next were fragments of musicians, and then scaphephori, men bearing wine-jars to be used in the sacrifices. These were preceded by the victims themselves, sheep and cows, part of which would be offered to the gods, being consumed by fire, and the remainder, with the wine, would be actually feasted upon by the people. Before these animals were kanephori, maidens carrying sacrificial instruments, and then a few figures of aged men, who were probably archons or magistrates. These led up on either side to the culminating point of interest; the facing groups of seated figures and those standing in the centre who took part in the actual presentation of the peplos. That the seated groups, each of six persons of great dignity of pose, were those of deities, there could be no doubt. The unpoetic observer might ask, How could it be supposed that the gods should appear sitting in the midst of the venerable magistrates, who yet seemed utterly unconscious of their presence? The artist intended this unconsciousness, and endeavoured to represent the gods as coming from Olympia and, unseen of mortals, accepting the sacrifices offered on the altar and sharing in the honour paid to Athené. The same mingling of the natural and supernatural was exhibited in the works of Mediæval painters. As to who the deities were, there had been published twenty-nine theories, and the battle of the gods still remained an open one in which young German writers might try to win their spurs. That one of the figures represented Zeus there was a consensus of opinion, and the general idea was that perhaps as many as eleven of the Olympian deities were represented, but he thought every attempt to mix with these local heroes was unsatisfactory. What they must hope for was that some new discovery would be made of a replica of these seated figures, showing their attributes, or even possibly giving the names. Between the benches on which these deities were sitting, was a group engaged in the actual presentation. The outer female figure on either side carried a stool upon her head, and two others seemed to be presenting offerings, and between these, on the right of the composition, a tall female, attended by a servant, was standing, partly unfolding the peplos which was being received by a female, also attended by a female servant. This veil we knew was embroidered with the exploits of Pallas-Athené and the battles of the gods; it was folded and placed on the knees of the statue, which was afterwards clothed with it on special occasions, and had, they also read, been brought at the head of the procession upon a mast on a wheeled ship, but was carried by hand up the steep ascent to the Parthenon. The lecturer referred to numerous passages in Greek writers illustrative of the Pan-Athenaic procession portrayed on this frieze, and added that the whole surface was probably coloured—the background being of a deep ultramarine blue, like the sculpture he saw excavated from the site of the tomb of Mausoleus possessed when first uncovered. In conclusion, Pro. Newton spoke of the great beauty, dignity, and variety of this frieze, as giving it inestimable value, and urged those present to carefully study the original fragments in the Elgin gallery. He announced that he should give a supplemental free lecture on Friday, the 11th inst. (to-day), at 3 p.m., on the recent discoveries at Olympus.

SANITATION AS AN INCREMENT OF VALUE IN HOUSE PROPERTY.

A PAPER under the above title was read on Monday before the Institution of Surveyors by Mr. H. H. Collins. To a large extent, it was similar in character to recent papers read at the Institute and elsewhere, only the conclusion of the paper being specially devoted to the subject indicated by the title.

For the benefit of those who object that sanitary work is costly, the author has approximately calculated the additional expenditure which would be required in the construction of a London house of usual character, having, say, 25ft. frontage, 60ft. deep, and containing five floors, giving a total height of, say, 60ft. At liberal prices, the work would not entail an original outlay exceeding £60. To alter such a house would cost £150 at the least. Allowing the builder 10 per cent. on his outlay, it would demand only £6 per annum to be added to the rent, a small sum when compared with the immunity from danger to life and health which it would secure. Any ordinary-size house, say, of rental of about £100 to £200 per annum, can be altered so as to be converted from an insanitary to a sanitary condition for a sum not exceeding £300. This statement must, of course, be qualified to this extent, viz., that no extraordinary difficulties present themselves; but Mr. Collins unhesitatingly asserts that in every case the expenditure need not be excessive; that in most instances it need not be but moderate; that under all circumstances such expenditure will pay itself in a few years by the saving in doctors' bills, the preservation of furniture, &c., and the cheerfulness and happiness which it must and will procure.

A Wesleyan Chapel is to be built at Youghal from Mr. Hill's plans; Mr. Kelly is the contractor.

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SELECTED DESIGN FOR NEWBURY GRAMMAR-SCHOOL.—SECOND PREMIATED DESIGN FOR THE LIVERPOOL SCHOOL OF ART.—THE READER'S HOUSE, LUDLOW.—WALL PAPER DECORATION.—ARTISTS' HOMES: NO. 12, MR. WILLIAM EMERSON'S HOUSE AT LITTLE SUTTON.—DETACHED TOWER, PEMBRIDGE CHURCH.

OUR LITHOGRAPHIC ILLUSTRATIONS.

NEWBURY GRAMMAR-SCHOOL.

We publish, to-day, the selected design, by Messrs. Power and Hughes, for the new grammar-school at Newbury. We fully described the design in our notice of the competition on p. 118, ante.

LIVERPOOL SCHOOL OF ART.—SECOND PREMIATED DESIGN.

The selected design in this competition was published in the Building News for Feb. 4, 1881, and to-day we are enabled to illustrate the second premiated design, the author of which is Mr. C. O. Ellison, F.R.I.B.A., architect, of Liverpool and London. Much dissatisfaction has been expressed at the result of the committee's award, and Mr. Ellison has refused to receive the premium awarded to him, while he claims the position of selected architect, his design having been placed first by the Art-Master of the school, who, it seems, reported on the designs for the committee. Our readers will now be able to compare the two plans, and judge for themselves as to the relative merits of the two designs. Our illustration to-day is from a drawing specially made for us by Mr. Ellison, as the committee declined to lend him the competition drawings, or, indeed, to allow any of the competitors to see either of the plans submitted. The following is a short description of the design published to-day:—The arrangements are very simple, the entrance being placed on the level of the present buildings, from which the new school will be managed, and must have ready access, and the attendant's room is so placed as to supervise both old and new entrances, whilst the secretary is provided with an office (instead of using the board-room, as at present) and lavatory; w.c., &c., are provided for use of the staff. All these rooms are 11ft. to 12ft. high, utilising the great slope of the street, whilst placing the ground-floor of the art-school on the level stipulated in the conditions. The staircase is immediately opposite the entrance, and entirely under control from the attendant's room. The whole of the rooms required by the conditions are provided, and in the best relative positions to each other, with an excess over specified area of over 300 super. feet, in every case lighted abundantly by large windows, with north aspect only, and no cross-lights whatever—not even a skylight being used—vital points of art-school arrangements, the importance of which the committee do not appear to have realised. The cloak-rooms for the ladies and gentlemen are separated by the entire length of the building, the former being a comfortable room in which the ladies can take their lunch (a want much felt by the present students), and from which the w.c.'s are entirely shut off by a ventilation corridor, whilst the gentlemen's w.c.'s, &c., are placed in an *open* court, entered from their cloak-room, so securing the best possible sanitary arrangements. Another want much felt is that of convenient places for the washing of modelling tools, boards, palettes, &c., and for the mounting of paper, a room for which has been provided on each floor, besides retiring room and w.c., out of the life classroom, for use of the life model. It is proposed to warm the premises by the use of open firestoves in the rooms, and hot-water pipes round the walls, corridors, and main hall, the flue from the furnace being an iron pipe passing up the centre of a 5ft. air-shaft, having connection with every room, so securing a certain extraction of foul air, therefrom, and consequent drawing in of fresh air, through specially-prepared places; air-shafts also being provided in connection with the flue from each stove, rendering the ventilation certain. The exterior is designed to harmonise with the present institution, of which it is to form part; the fronts to be of white stone, with coupled columns of polished granite to the entrance-porch, over which it is proposed to place a group of statuary, indicative of the purposes of the building.

REFERENCES TO PLANS.

⊕ Office in existing premises, from which the entire institution will have to be worked.
A. Entrance to art-school from the street.
B. Entrance to art-school from institute.
C. Attendant.
D. Lavatory, w.c., &c., for use of staff.
E. Foul-air exhaust shaft for ventilation.
F. Secretary's office, or extra elementary classroom.
G. Boys' entrance to institute playground.
H. Architectural classroom.
K. Ladies' retiring room.
L. Second elementary room.
M. First elementary classroom.
N. Modelling room.
O. Room for paper mounting, palette-washing, &c.
P. Store-room.
Q. Gentlemen's cloak-room.
R. Painting room.
S. First antique room.
T. Second antique room.
V. Head master's room.
W. Life classroom.
X. Life model's retiring-room.
Y. Ventilation corridors cutting off the w.c.'s from main building. Plan No. 2.

THE READER'S HOUSE AT LUDLOW.

The Reader's House at Ludlow is a fair sample of the excellent half-timbered work abounding both in the town itself and neighbourhood. It is situate behind the church, and was the official residence of one of the clergy who held the post of Reader. The house is now used as a store for a tradesman in the town, having long since fallen into disuse as a dwelling. There is little or no detail worth drawing internally. The name of the original owner of the house, together with date of erection (1610) is carved on the head-beam of the upper window.

ROSE PATTERN WALL-PAPER DECORATION.

One of our plates to-day illustrates the last new decorative design prepared for Messrs. Jeffrey and Co, of Essex-road, Islington, by Mr. Walter Crane, who has thus described the design of the rose pattern: "'To those who have been long in city pent,' this wall-paper may perhaps help to recall the 'plaited alleys of the trailing rose' and other pleasurable places. The briar-rose on the wall is changed to the garden rose in the dado and frieze, having, in those positions, a more conventional form in accordance with the more strictly-defined limits of the pattern, as well as its figurative or emblematic intention. In the intermediate panels of the frieze and in the central panels of the dado, it will be noticed that the rose-tree springs from a heart-shaped root (perhaps its native soil), and bears, for central flower, the winged head of an Amorius (a personage not altogether unconnected with its culture), while the crossed arrows through the garland point to the moral of the old song:—'When I gather the rose so red there groweth up a sharp thorn there.'" The colourings are of the most delicate and harmonious kind, rendering the effect of the design hospitable in every way, and quite unobtrusive. This may be said equally of the executed work as of the original cartoon.

ARTISTS' HOMES: NO. 12—MR. WILLIAM EMERSON'S HOUSE AT LITTLE SUTTON, CHISWICK.

Little Sutton was an old house, parts of which were in existence before the time of Cromwell. It is situated in a picturesque old garden, surrounded by ivy-clad walls and fine trees, one of the cedars being extraordinarily large and perfect, its huge branches covering a space of over 90ft. in diameter. The greater part of the old house being uninhabitable through decay, was pulled down; the old parts are shown in black on the plan, and the new hatched. It is faced with red bricks, and red Corsehill stone dressings and covered with tiles. The plan was arranged so as to preserve the old kitchen, billiard-room, morning-room, and conservatory. The hall, entered from a verandah in connection with the entrance-porch, is surrounded by a dado, the height of doors; the lower panels are filled with tiles made to design, by the School of Art at Bombay. The woodwork is painted a mottled blue colour, harmonising with the general tone of the tiles, the whole being something the colour of lapis lazuli. The staircase is divided from the hall by three arches, through which is seen the staircase-window, representing, in stained glass, the Earth, Air, and Water. Under the central arch is the fireplace, on the hood of which will eventually be a bronze figure of Orpheus, on a ground of mosaic. The floor is of marble mosaic, and round the border are the various beasts listening to the music, the trees, and river, &c. Above the dado, and on the wooden panels of ceiling, will be the birds, &c. The woodwork of dining-room is plain American walnut, the panels of dado being filled with dark Japanese leather-paper. The panels and beams of ceiling are of stained and dull varnished fir. The drawing-room woodwork, and furniture throughout, is painted a mottled greenish blue, after the same manner as the hall. The decorations of this room, when complete, are intended to illustrate Chaucer's "House of Fame." The chimney-piece, of alabaster, is surmounted by a Caen-stone design, on a rock of glass, showing the entrance to the castle, with the various figures mentioned in the poem, carved in half-round relief, and the gateway itself also richly and quaintly carved; the rock of glass representing the ice on which the castle was supposed to be built, and on it are cut the various famous names of the world's history. In the frieze all round the room will be the figure of Fame and the various groups of suppliants, and the pillars with the groups upholding the renown of ancient cities and nations, &c., executed in very low relief, and painted on a ground of blue and gold. The panels of ceilings will have conventional designs and the heavenly bodies on ground of gold and blue. The morning and other rooms have no particular scheme of decoration prepared, and are simply painted and papered in quiet tones.

DETACHED BELL-TOWER, PEMBRIDGE CHURCH, NEAR HEREFORD.

We are unable this week to give a description of the picturesque belfry illustrated in this sketch.

The largest order for church furniture ever given out from New Zealand has just been shipped by the well-known firm of Jones and Willis, of London and Birmingham. It was intrusted to them by the architect, Mr. B. W. Mountford, and is for Christ Church Cathedral. It comprises nearly every requisite for the fittings of a church.

New schools are about to be erected at Slough-lane, and considerable additions to the Brasshouse-lane and Corbett-street schools for the Harborne and Smethwick School Board, from drawings by the architects to the board, Messrs. J. P. Sharp and Co., of Birmingham.

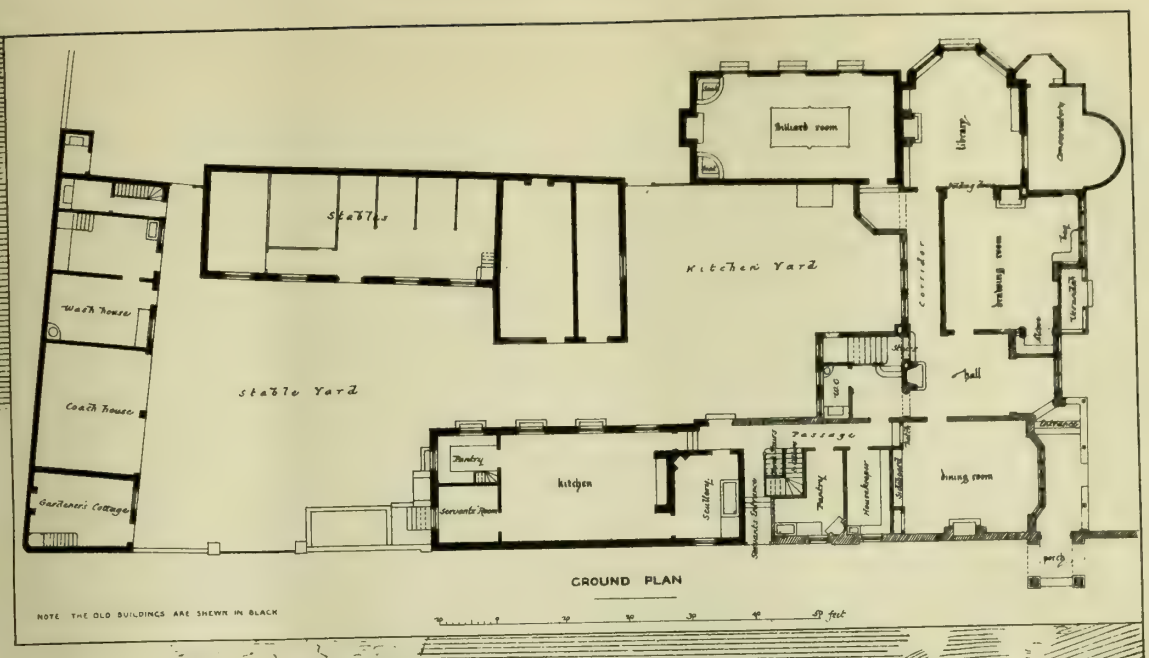
The Duke of Norfolk has commissioned Mr. G. Gilbert Scott to prepare plans for a large church in the Early English style, which he is about to erect in Norwich, in fulfilment of a vow. The site selected, and given by the duke, is one of the most commanding in the whole city, being that on which stood the old city gaol.

A new school chapel, dedicated to the "Holy Cross," was opened on the 1st of March by the Bishop of Nottingham, at Hucknall Torkard, Notts. It is a plain substantial building, in red bricks, with an open roof. The trusses, with the exception of principal rafter, are of iron, and possess a light, yet good appearance. The work has been carried out from the plans and under the superintendence of Mr. Richard Whitbread, architect, The Lodge, Burton Joyce, Nottingham. Mr. Chas. Houldsworth, of Hucknall, was the builder.

ARTISTS HOMES Nº 12

Mr WILLIAM EMERSON'S HOUSE, LITTLE SUTTON, CHISWICK

WILLIAM EMERSON F·R·I·B·A· ARCHITECT



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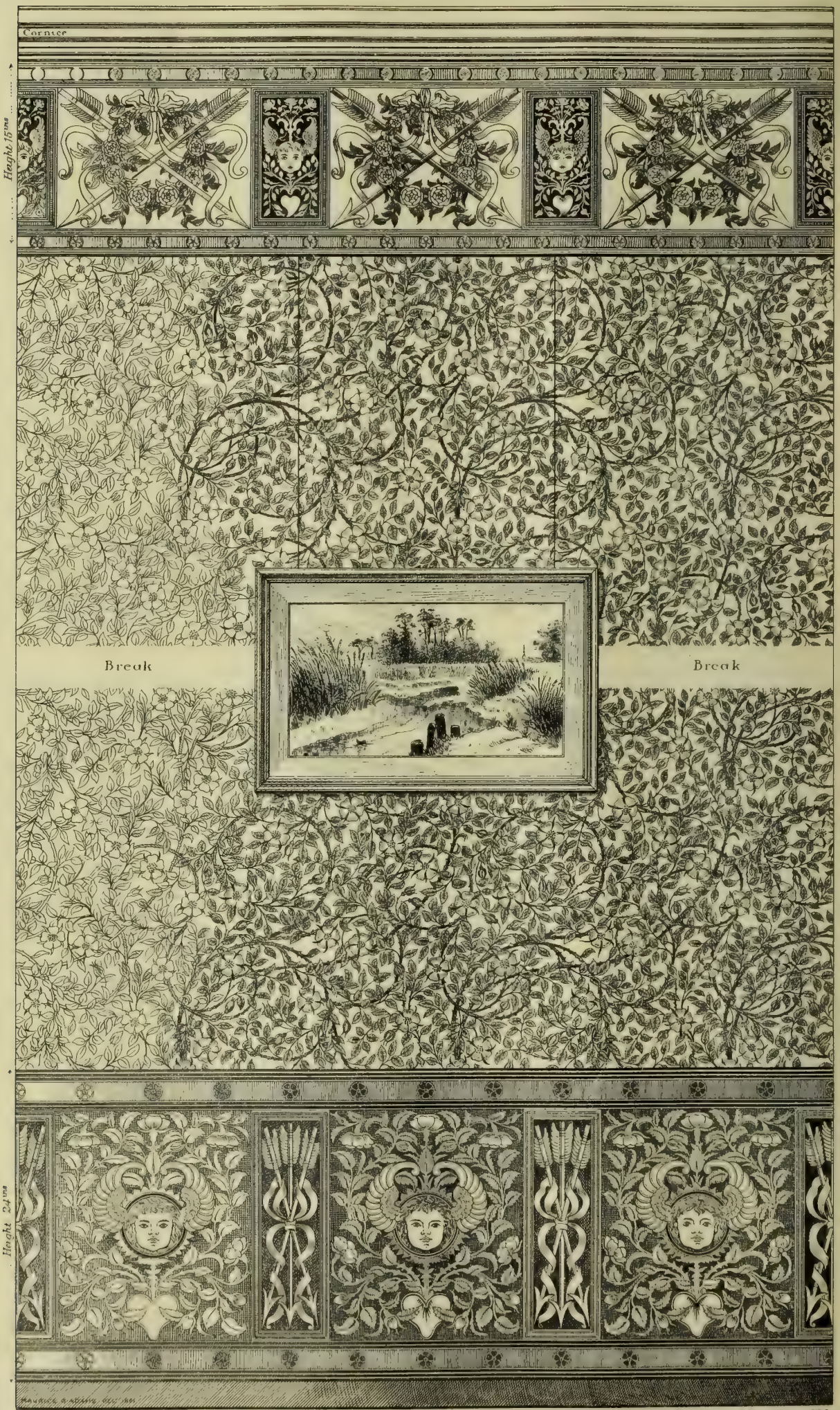
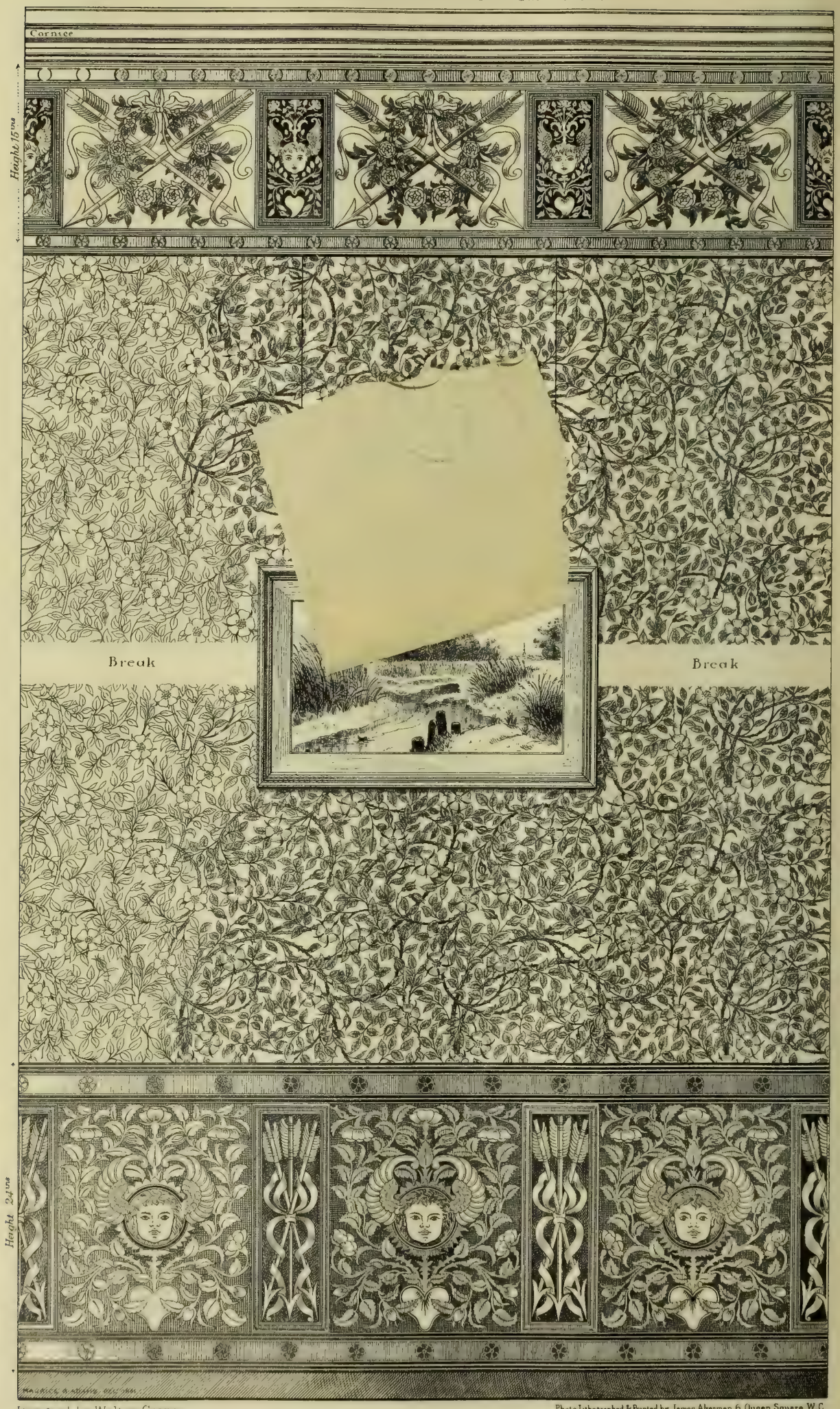


Designed by Walter Crane

Photo Lithographed & Printed by James Akerman, 6, Queen Square W C

ROSE PAPER, WALL DECORATION, MADE BY JEFFREY & Co



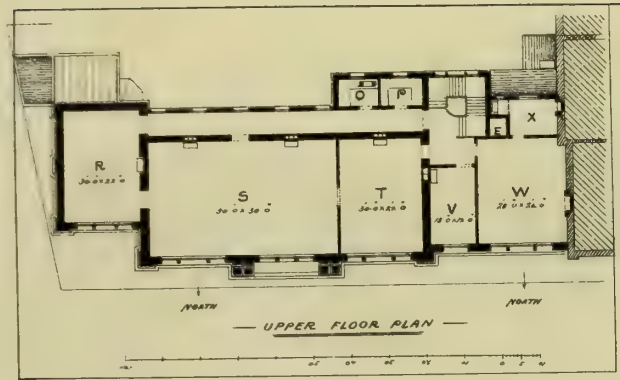
Designed by Walter Crane

Photo Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

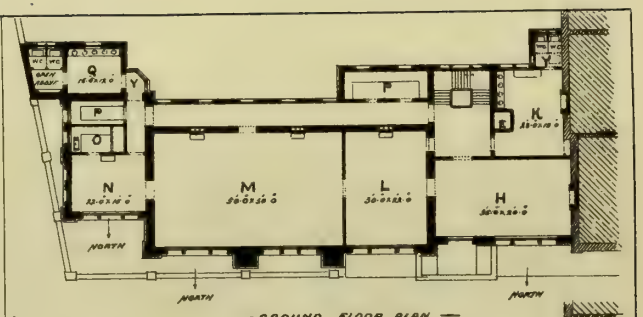
ROSE PAPER WALL DECORATION, MADE BY JEFFREY & Co.

SECOND PREMIATED DESIGN FOR THE LIVERPOOL SCHOOL OF ART.

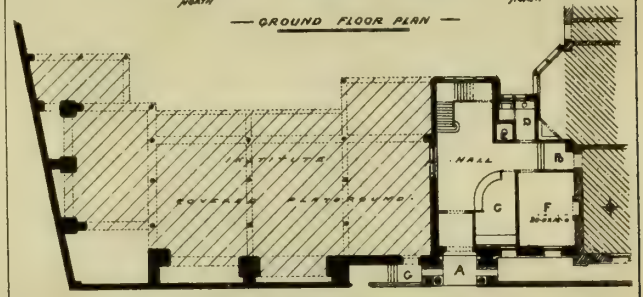
C.O ELLISON, ARCHITECT.



— UPPER FLOOR PLAN —



— GROUND FLOOR PLAN —



— PLAN ON INSTITUTE LEVEL —

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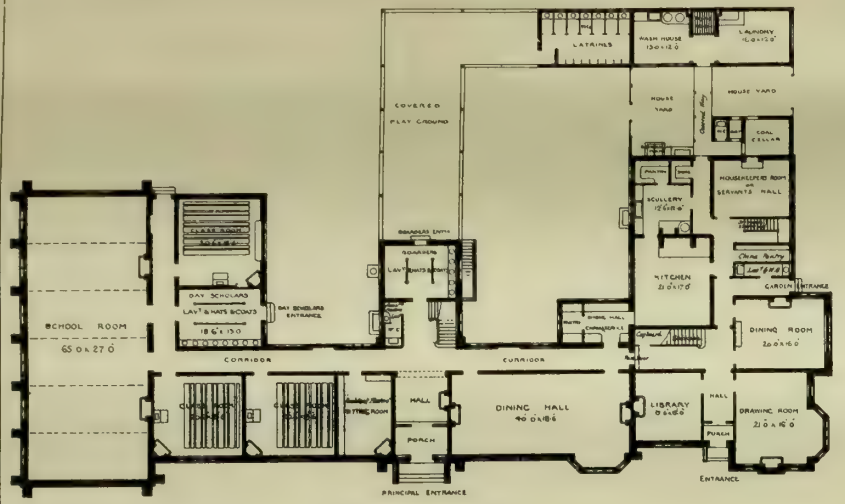
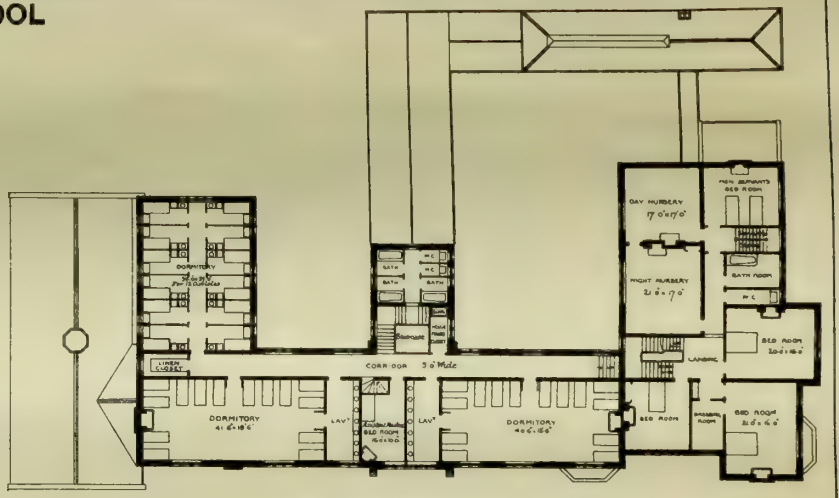
NEWBURY GRAMMAR SCHOOL

SELECTED DESIGN

POWER AND HUGHES
ARCHITECTS.



GROUND PLAN



FIRST FLOOR PLAN

Photo Lithographed & Printed by James Akerman, 6, Queen Square W C

The Reader's House

LUDLOW

MULLION THROUGHOUT

2"

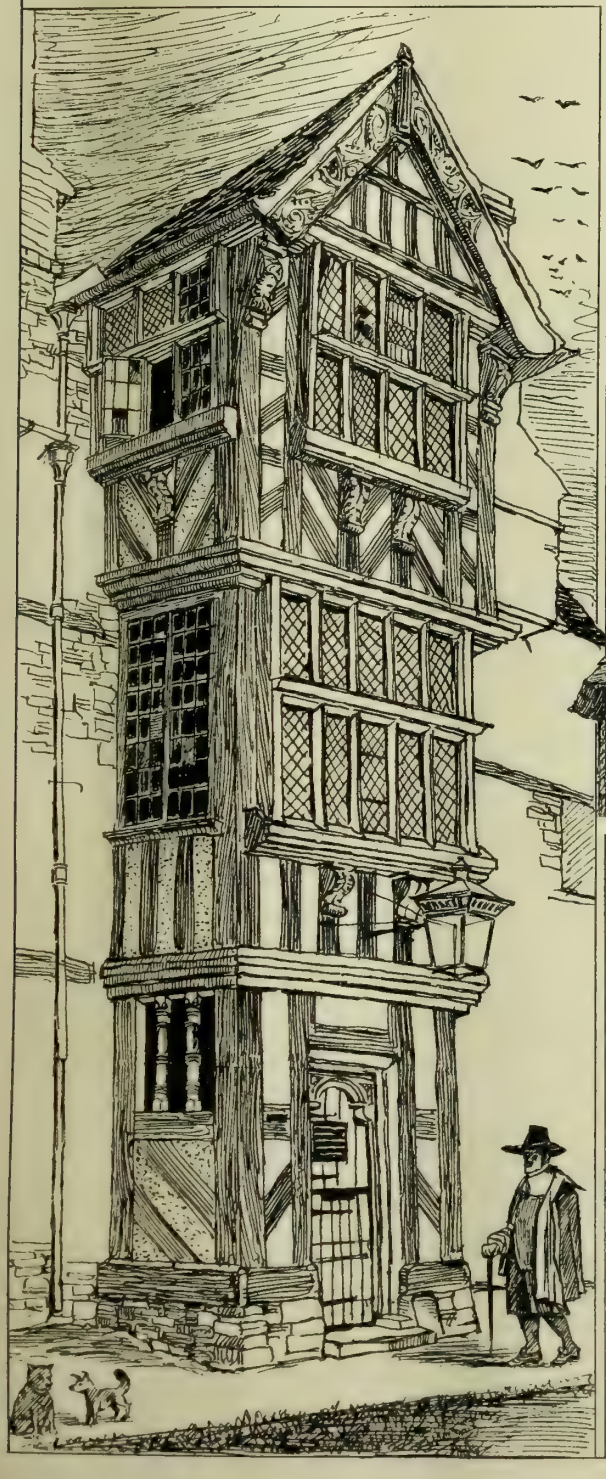
3"

SECTIONS OF MOLDINGS &C

DOOR JAMB

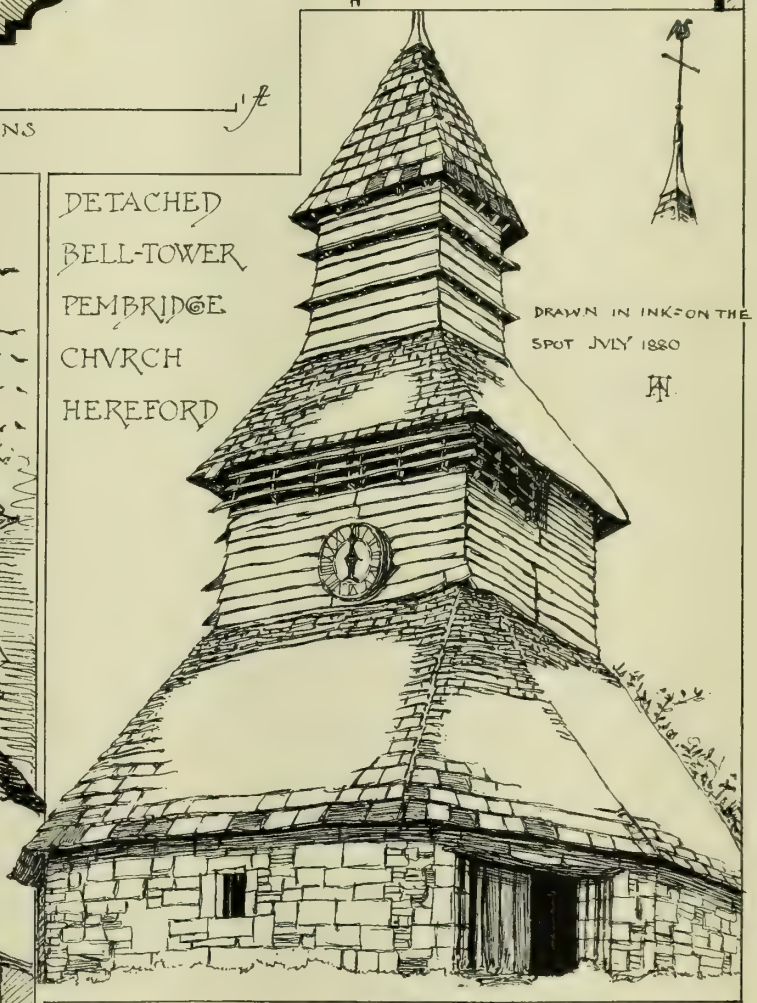
12 ins 9 6 3 0 1 ft

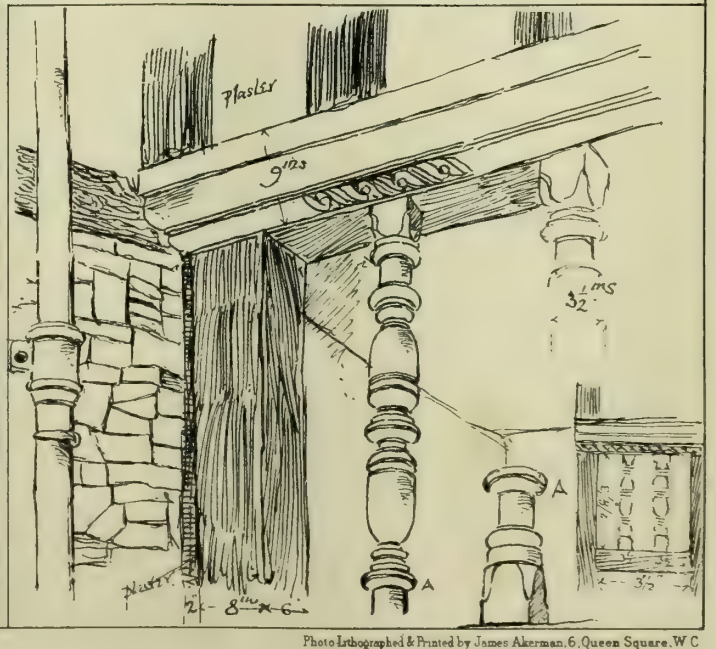
SCALE FOR SECTIONS



DETACHED BELL-TOWER PEMBRIDGE CHURCH HEREFORD

DRAWN IN INK ON THE SPOT JULY 1880





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THE FABRIC OF THE CHURCH AT THE PRESENT DAY.

At a meeting of St. Paul's Ecclesiological Society held at the Chapter House, E.C., on Thursday, the 3rd inst., Mr. Edmund B. Ferrey, F.R.I.B.A., read a paper on this subject. Having introduced his subject by a sketch of the revival of Ecclesiastical Gothic in this country, as a result of archæological research and the publication of architectural drawings, the author touched on the polychromatic decorations and other modifications rendered fashionable amongst architects by the study of Continental churches, and expressed his satisfaction that the rage for the exact reproduction of the details of Continental churches had passed away; adaptation and not importation was the true principle which should guide us in the study and use of old work. Proceeding to the immediate subject, Mr. Ferrey exhibited a series of ground-plans of Italian basilicas, and, alluding to the atrium often found in front of these, said: I have often thought that such a feature as these courtyards might, with advantage, be introduced in London churches, were ground not so valuable. The vaulted cloister walks round this court, with a fountain in the middle, would be a fitting preparation for the entrance of the worshipper into the church itself. Although unfortunately we have not a superabundance of sunshine in our climate, the arcades not only would, when necessary, shelter one from the sun, but more often from the less welcome rain. Of the basilican plan we have few modern examples in England—the arrangement does not seem to gain ground. There is, of course, the celebrated example at Wilton, built for the late Lord Herbert of Lea, and St. Barnabas, Oxford, and within the last year, St. Augustine, Stepney. The latter has, however, no Roman or Italian details—it is in the Gothic style. At the same time, the number of churches founded on the basilican type, which have no constructional arch or division between the nave and chancel, is on the increase, the limits of the latter being defined by a screen or by some ornamental treatment in the roof-truss over. The nave and chancel are, then, of the same width, which is an advantage in many ways, except in the point of art. If the chancel is broad, to be in good proportion, the length should also be great. But I think in a large church, to make no distinction externally between nave and chancel, or any break in the roof, is monotonous; whereas, in a small church it may do very well. A chancel-arch well treated may be made a very noble and dignified feature. The narthex or western porch to the ancient basilica was generally long and narrow, agreeably to the meaning of the word, "a rod." This adjunct is not often found in the Middle Ages, except occasionally in some of the cathedrals, such as Ely, or at Durham, where it is called a Galilee, supposed to be in allusion to Galilee of the Gentiles (really a Lady-chapel at the latter), and holding the same position to the remainder of the church as the narthex. The south, or sometimes north, porch, of a different form to the narthex, took its place. It is curious how, in the present day, the term "narthex" has become so popularised than even in Nonconformist chapels one finds it used, or rather misused. I, for one, therefore, rather now avoid the word. A vestibule of this kind is very useful. By contriving a baptistery in the centre, and porches to the north and south of it, with their entrances as shown, a feature in the church effective both externally and internally is obtained. The original type of basilica, of course, had no transepts. The space between the top of the columns or arches of the nave was greater than in Mediæval churches, and the range of mosaic figure-subjects is a feature I should like to see adopted in England—a triforium belt, as Mr. Fergusson well calls it. I do not pretend to say that it is equal in effect to a triforium, where depth of shadow and recess is necessarily obtained. But more height is required for the triforium, and it is difficult, as will be commented on presently, to make much use of it except on rare occasions. The ambones, or pulpits on each side of the entrance to the chancel, for reading the Gospel and Epistle (the old arrangement in the basilican churches), scarcely seem to suit the tastes of the present day; but the baldacchino, or canopy to the altar, is a feature many would like to see introduced. I speak of it from an architectural point of view, not from a theological. Then there is that striking feature in the later basilican churches, the confessio, or shrine of a saint, beneath the choir, with the ever-burning lamps in it. This gives us no help for our church. In our town churches, where space is so valuable, there is no reason why a morning-chapel should not be made under the chancel, with a flight of steps down to it in the centre, and access to the choir by steps up on each side. In several churches, where the ground slopes rapidly down towards the east, advantage has been taken thereof to make use of the extra height for a vestry, as at the parish-church, Yeovil, and at Worsham Church, North Wales. But in these cases there is only a spiral staircase of approach. For basilican churches the apsidal termination to the chancel is almost invariable. But there cannot be the slightest objection to a square end. An apse cincta, *i.e.*, semi-domed, needs, in order to be complete, decoration with mosaic or fresco. Moreover, an apse, whether semi-circular or polygonal in form, wastes room which is generally valuable, particularly in town churches. Like the narthex, the apse, so beautiful a termination to the chancel, has been so much travestied, either roofed over in the most clumsy manner with open timbers, or in make-shift manner into a wood panelled ceiling, that one is tempted to be tired of it. The apse ought either to be a semi-dome, executed in brick or in stone, or, better still, groined in brick or stone. In our Mediæval churches the east-window is generally a marked distinctive feature. But in an apse the eastern-most window is no more important than its fellows, and owing to the cornice or wall-plate being continuous at the same level all round the apse, there can be little height for a good reredos. In the square east end the extra height of wall obtained by the gable makes it possible in the first case to have an east window of some importance, and secondly, for the same reason, affords greater height for the reredos. Again, more space for the sanctuary is given, and the expense is undoubtedly less than in an apse, where the roofing and its adjuncts are always rather costly. At the present day the architect is frequently rigidly tied down to a small expenditure quite inadequate for the requirements. While I admit that no building, whatever its destination may be, is perfect unless suited to its uses, I plead for a little latitude in the treatment and ornamentation of the aisles and such accessories. To maintain, as has been said, that *every part* of a church, whether occupied by the worshipper or not, should be free from obstruction, is absurd. It is not absolutely necessary that there should not be a single column or interrupting pier of any kind. Though churches are erected to be used, they must not be regarded in the same light as a theatre or music-hall, where it is, or ought to be, a *sine quâ non*, that as each of the audience pays for admission to see the play, he must have his money's worth. A little mystery in the plan of a church is a good thing; so that any one entering in at the west door does not see the whole of the place without coming any further. But in small churches it may often be advisable to rest content with an aisleless nave, whilst aisles can be put to the chancel, one for the vestries, the other for the organ. In these cases, where funds are not much restricted, the morning-chapel (an almost essential feature in the large church of a town) might well be placed at the east end as a lower building separated from the chancel by an aisle, and the model of the Lady-chapels attached in this situation to so many of our cathedrals. Means of shutting off the chapel, when in use, by thick curtains, should be contrived, both for the sake of warmth in cold weather and for acoustic reasons. The arrangement of such a cathedral as Alby, France, having no aisles, but a series of small chapels separated by solid walls, or, in other words, internal buttresses, would be quite suitable to the worship of our communion, with only the slight modification of cutting archways through these partition walls. Such a plan has been carried out at St Augustine's, Pendlebury, near Manchester. I should add that the nave and choir at Alby Cathedral are of like width, with no marked break between them. A good deal has been said at different times about the absurdity of columns in churches of the ordinary nave-and-aisle arrangement. The objection has been surmounted to some extent by building wide naves and very narrow aisles, and this, to some extent, does away with the complaint that columns embarrass the worshipper, and are bad for sound. But it is very easy to theorise, and what looks very pretty on paper often breaks down in practice. For example, if it is agreed to build two chancels, the total internal width of which shall be the same, but differently divided as regards the proportional width of nave and aisles, thus: No. 1. Nave, 35 feet wide, aisles each 6ft.; No. 2. Nave, 25ft. wide, aisles each 11ft., the total internal width from aisle wall to aisle wall will be the same in each case, with the exception of a slight additional thickness to the 35ft. nave wall. But when the elevation is designed it will be found that at starting the great width of No. 1 involves increased dimensions in the whole church. The doors and windows must be larger, the porches more important, and the tower of greater size. Moreover, the wider the span of the building the stronger in proportion must be the strength of the roof-timbers, as they have to bridge a greater void than usual without any intermediate support. And if there is abundance of timber in the roof, care must be taken to make the walls sufficiently strong and rigid, while ample buttresses must be built to resist the thrust on high walls. For if the span is wide, to be in good proportion, the height must also be great. Care must also be taken not put too heavy a covering on such a roof. All these points have to be weighed when a church of this plan is to be built; but I believe from experience that these structures of great scale, although only to the extra amount of bricks and mortar used in them, they ask more in that particular item, yet altogether they are little more expensive than others containing about the same accommodation. I am not now speaking "without book," but from an investigation I made a short time since. Height and size are unquestionably powerful helps to dignity of architectural effect. As a broad general rule the larger the scale of the church the less adventitious ornament it absolutely requires in its details—the eye is impressed by the size. I do not mean to say but that the larger church will not be improved by or bear ornamentation. To illustrate my argument, take such opposite examples as the nave of Ely Cathedral, and Roslin Chapel. Were the latter as plain and even as the former, we should think nothing of it. On the other hand, were the nave of Ely Cathedral abounding with "apprentice pillars" and such like profuse ornamentation, we should not probably consider it much improved—we should say, "There may be too much of a good thing." Another important element of grandeur is repetition of parts. Suppose, for instance, a church of four bays of very plain design, and then another one exactly similar, but with eight bays—how far more handsome the latter would look than the former. There is no more remarkable example of this than in that most effective feature of Mediæval churches, technically called the trussed rafter roof. What could look plainer, almost poverty-stricken, than one pair of these trussed rafters. Multiply this by a forty, and how singularly effective! I regret that I cannot recommend this type of roof for our churches now. Sound gets swallowed up among the forest of timbers—that is one objection. Again, although it is possible to employ coloured decoration, the scanty width of one foot between each rafter and the necessarily limited space and the timbers themselves give little scope. If the under-side of the rafters and braces are boarded, and moulded transverse and longitudinal ribs fixed so as to form panels, abundant and unrestricted space is left for the brush of the decorative artist. Far be it from me to suggest any such treatment of subjects as in the ceilings of the Renaissance churches of France, or Italy, or like Michael Angelo's frescoes in the Sistine Chapel, Rome. No worse or more uncomfortable position for them to be examined could be devised. I would only suggest some species of figure-decoration appropriate to the distance from the eye, and to some extent conventionalised, and brought into harmony with the architectural surroundings, not like a canvas cut out of a picture-frame, and stuck up in the ceiling, on the chance of looking all right. The wood ceiling has further advantages: it gives a neutral space of air between the interior of the building and the external atmosphere, making the church warmer in winter, cooler in summer, in fact, far less subject to variation of temperature. It is also better, acoustically, not only for the clergy and congregation, but for the organ and choir. There is, however, rather a risk of echo in a barrel-shaped or arched ceiling, with only a few projecting ribs. I would, therefore, suggest the introduction of ornamental

as well as useful principals, which would tend to break the echo and give variety and richness to the roof. It is often alleged as an objection to churches of great span and height, that the preacher cannot be heard, and that in every way they are bad for sound. I cannot admit this, for the obvious reason that I believe large churches can be built free from this defect if only certain rules are followed. While admitting that in some cases the ordinary laws of accoustics seem to belie themselves, still the broad rule of avoiding large flat unbroken surfaces of wall (fertile sources of echo), the avoidance of cradle-shaped ceilings of great length of wood (or more particularly barrel-vaulting of stone), unless there are collar-beams or principals, to check the waves of sound, the introduction of arcades, or in other words, *aisles* to the nave, all help towards the desired result. I am also inclined to think that if pendant gas-lights be used, the long suspending rods are very helpful in preventing echoes. Wood screens are a valuable element in every way to a church; (1) for ritual reasons, (2) for protection to that part of the church adjoining the altar, (3) as giving an appearance of warmth and furnishing to the building, and taking away that cold and unfinished look which some churches have. We must all agree that churches ought not to look as if they *never* had any worshippers in them, except on Sundays and Saints' days. (4) Screens serve the function of mile-stones, by which, in imagination, to measure the length of a church, and thus in the most legitimate manner to make it appear longer. It has been sometimes proposed to build naves circular or octagonal in plan, upon the fashion of Aix-la-Chapelle Cathedral, or St. Gereon, Cologne. This is not only a *costly* arrangement, owing to the many breaks and angles in the wall, but also owing to the difficulty of roofing it. For this form to be really effective, it should either be vaulted or domed over, or have a kind of lantern. At All Saints', Harlesden, is a church with octagonal nave (the chancel is not yet built), designed upon the theory that every one should see and hear, so there are no columns or other interruptions to view. Owing to the large span, the construction had to be very strong, and there is almost a forest of timber employed, with a due allowance of bolts and straps. The effect is picturesque, but we cannot say dignified, being a little too suggestive of a secular building. In this instance the difficulty of vaulting over the space would have been the expense. Moreover, immense buttresses in very thick walls must have been built to resist the thrust of the vaulting. I admit that wood vaulting is sometimes used with the object of lessening the weight and consequently thrust. I admit also that there is Mediæval precedent for it. But, in my humble judgment, wood vaulting does not seem a natural use of the material; stone, brick, or tufa being more legitimate for that purpose. The plan of a series of small gables at right angles to the nave, instead of a lean-to aisle, though found in some German churches, is in every way expensive and destructive of that quietude and repose in design which should characterise an *aisle* necessarily subsidiary to the nave. Moreover, it is not a common-sense mode of roofing, whereas a lean-to roof is. Some fifteen years since this mode of roofing was very prevalent among architects, but happily did not last long.

(*To be continued.*)

THE NEW VIADUCT AT MOORSWATER.

A WORK of great magnitude—that of building a stone viaduct to take the place of an old wooden structure at Moorswater, on the Cornwall Railway—was on Friday week brought to a successful termination. Travellers on the Cornwall Railway cannot have failed to have observed the extensive railway repairs which are being carried out in connection with the numerous viaducts and bridges marking the course of the line between Plymouth and Falmouth. Between those two towns there are forty-one viaducts, varying from the level of low arches to the height of 150 to 160 feet, and the majority of this number are constructed of timber. These viaducts are a subject of special care, six separate gangs of workmen being constantly employed in no other duty than maintaining them in condition. Now, however, the company are replacing the old arches by works of more durable construction, and which, in the long run, are likely to effect a considerable saving in the costs of maintenance of the road. Most of the original viaducts are built of timber on stone piers, and they are so constructed that any one beam can be taken out without impairing the stability of the arches; but the new viaducts are constructed entirely of stone obtained from the company's quarries at Westwood in the Glyn Valley. Already a number of the bridges have been renewed, including those at Drawwood, West Largin, Clinneck, Westwood, and Penadlala, all between Bodmin-road and Doublebois, but the greatest undertaking of the whole was that at Moorswater. The date of the commencement of operations was April, 1878. Mr. T. H. Cole, a young engineer from the chief office at Plymouth, had charge of the works, and after his death, due to an accident sustained in the performance of his duty, Mr. T. H. Gibbons was appointed to succeed him as engineer in charge of the new works, and as assistant of Mr. P. J. Margary, engineer of the Cornwall Railway. The new Moorswater Viaduct is composed of eight lofty arches, the highest of the six inner arches being 148 feet above the ground, and those at the sides about seventy feet in height. The arches have a span of eighty feet, and thirty-four feet rise: their breadth is twenty-one feet, and they are full segments. There is a broad foundation of cement concrete forming the base of the piers supporting the arches. This foundation goes down about twelve feet to the solid rock. The thickness of the masonry in the piers is twelve feet at the base, with a batter of one in sixty, and they are built of dressed Westwood stone, in blocks of from three tons downwards. The arches are three feet thick at the crown, and five feet at the haunches. The soffits are of dressed Westwood stone, and the facing quoins of Cornish granite from Messrs. Freeman's Caradon quarries. Except the spandrels of the several arches, the whole work is of solid masonry, and thus strength and lightness are obtained by carrying up the casing walls to the level of the crown of the arches. At that level three dividing walls are carried the full length of the viaduct, and upon these two low, longitudinal arches are turned, which make the roadway. The full width of twenty-four feet given for the roadway is obtained by three overhung courses of picked stone, which affords an additional breadth of eighteen inches on each side. The massive slabs of Westwood stone forming these courses are each about a foot in depth. The ends of the viaduct are closed with masonry. The roadway of twenty-four feet leaves 2ft. 6in. clear of the rails on each side. The iron railings upon the viaduct are 3ft. 6in. above the rails, and the manholes, projecting slabs of masonry over all the piers, are 6ft. 6in. by 2ft. 6in. The structure is 802ft. in length, 148ft. in height, and practically straight, though the viaduct it has replaced was built on rather a broad curve. The quantity of stone used in the structure is about 50,000 tons, in blocks of from 2 to 4 cwt. each, and the total cost is £30,000.

THE WORKING OF SLATE QUARRIES.*

SLATE-QUARRYING is not one of those subjects which have been over-written about, and the little book now before us, from the pen of a practical quarryman and owner, Mr. Morgan Richards, of Bangor, comes to us, therefore, with a certain amount of freshness in a literary point of view. The writer in fact does not set up any claim to be considered an author; he writes simply a practical treatise for practical quarrymen and capitalists, and his object throughout is to inform those who invest in slate-quarrying, but who have no practical knowledge of the business. Many capitalists part with their money on the solicitation of adventurers who have nothing to lose, but all to gain. The author also exposes the impudence and assurance of pettifogging managers, who know little of slate-quarrying, though they cut a dash and speak the loudest. The first part of Mr. Morgan Richards' treatise deals with the defects and advantages of the present system of working slate-quarries in North Wales. He shows that money is often thrown away on places that can never prove remunerative, as well as on good quarries, worked in a defective manner. Even geological theories are sometimes at fault. The author relates how the devotees of geology, in their over-trust in deductions, become dupes to their blind belief. They overlook secondary causes in primary. A company was once started in London, where, says the writer "great bubbles are generally formed," for following and working the splendid slate veins of Lord Penrhyn's quarries. "Six great engineers, learned in Cambrian geology, started post-haste from the metropolis, duly arriving at Bangor;" they drove to Bethesda, ascended y Fronlwyd, and Carnedd, Llewelyn, and "after much levelling and surveying, came to the solemn conclusion that the Bethesda veins were running direct to Puffin Island, and the great Orme's Head. Thither they went to find, as they confidently expected, their grand theory realised; but, to their dismay, instead of finding slates, they only met the eternal hard gridstone, stretching out its sinewy arms to embrace the fawning waves of the billowy sea, that for ever come and go with awful grandeur that defies all description." The author says, truly enough, that the opinion of two or three practical quarry-managers is more to be trusted and valued than all the reports, drawings, and sections of learned geologists and engineers. Many failures in speculations are traceable to two causes: (1) "venturing at places that no honest experienced man would recommend; and (2) extravagance in the expenditure of money, and mismanagement in opening quarries that would pay well if judiciously and economically worked." What with extravagant boards of directors and non-resident engineers, the construction of grand tram roads and powerful engines, smart offices, and unfathomable shafts, a great show and stir is made; but the article wanted, slate, is not found.

The slate stratum of North Wales is described by the author, and will be found of practical value to those interested; the great beds of Carnarvon and Merioneth are its main divisions, but the author points out to those who are too often misled by the reports of new companies, that it is a fallacy to assume a slate stratum traceable for some miles is one continuous undisturbed body of the same size, hardness, colour, and cleavage, and that, because one quarry has a good yield and reputation, others on the same track must be the same. Instead of this, practical quarrying reveals numerous minor and secondary causes that affect a slate vein, even producing different textures and colours of the material in the same quarry. The author very strongly condemns "the bad effects of letting slate bargains partly by poundage, partly by the yard or ton, and partly by giving so much money in the pocket of the bargain," and illustrates it by actual figures, the prices paid for making, and the selling price per thousand. In short, it is recommended to adopt in letting, the "standard price and poundage system" pure and simple, and that no bribe money should be given over and above the standard price, and poundage paid for working the "bargain" for a month. The causes of waste in quarrying are summed up by the words "bad management," and the author shows that good management is the only way of avoiding waste. The causes of waste are briefly enumerated as follows: (1) By working quarries in one deep pit, instead of in galleries; (2) by working them underground without removing the top; (3) by working them irregularly, with a view of making immediate large returns; (4) by working them unskilfully, and by using machinery, plant, and tools ill-adapted for the work. These several causes are discussed at length. The great advantages of working quarries in galleries instead of pits are clearly pointed out. The crew commencing to work on the pit method has to throw all down to a depth of, say, 50 yards; but on the gallery system only about 10 yards has to be removed, a safe and convenient depth for the men to work at. Much waste also takes place in cutting slates by the ordinary method with chisel and hammer, which might be avoided by the sawing and dressing-machines used in the Festiniog quarries. The concluding part of Mr. Richards' treatise deals with the relation of landlords and quarry-owners, but we are restrained, by want of space, from alluding to the sensible remarks on the vexatious restrictions imposed by landlords, and their effect in paralysing speculation, and other observations on the relation between quarry-owners and their work men. We heartily commend the book as a practical guide to the working of slate-quarries

* Slate-Quarrying, and How to Make it Profitable. By Morgan Richards, Bangor. London: Watts and Co., Fleet street.

THE UTILISATION OF REFUSE.

A SYSTEM of destroying the noxious properties of refuse, and converting it into more or less useful matter, has now had a fairly extended trial at several towns in England, notably Leeds, Blackburn, Warrington, and Derby, and has been found fairly successful. Leeds has led the way in these improvements, and the municipal authorities are satisfied with the result. The furnaces and other appliances were designed by a Mr. Fryer, of Nottingham, and their first practical trial was made at Burmantofts, about two miles from the town-hall of Leeds, by the erection of a six-celled destructor and a carboniser. The destructor consists of six (or more) compartments or cells, built in brick, lined with firebrick, and tied together with iron rods. It occupies a space of 22ft. by 24ft., and is 12ft. in height. An inclined road leads to a platform over the top, and another incline leads from the level of the firing-floor to the adjoining road. Each cell is capable of destroying or carbonising seven tons of refuse in 24 hours, and to secure the greatest economy, the work goes on uninterruptedly. The cells consist of a sloping furnace, with hearth and firegrate covered by a reverberatory arch of firebrick, with one opening for the admission of refuse, another for the escape of the gases, and a furnace-door for the removal of clinkers. The refuse is emptied on the platform, and shovelled into the cell, falling first on the incline, thence reaching the sloping hearth, whence, when sufficiently dry, it is pushed on to the fire, where, owing to the radiant heat of the firebrick arch, it burns fiercely, the products of combustion being gases, a fine ash, and clinkers. Every other cell is provided with an opening large enough to take in infected bedding, mattresses, &c., as well as diseased meat. The gaseous products of combustion pass through a flue to a boiler, which supplies steam to a horizontal engine driving two mortar-mills. In these mills the clinkers are mixed with lime, and ground into an excellent mortar, which sells readily at 5s. a load; while the tin cans and iron are sold for old metal. No fuel of any kind is required, the cinders and other combustibles found in the refuse supplying all that is needed. During the year 1879 the following is an account of the work performed by the Burmantofts destructor:—14,000 tons of rubbish; 190 beds and mattresses; 264 carcases of pigs attacked by some fever; 1 cow, 10 sheep and lambs, 28 quarters, and 13cwt. of bad meat. The staff required for each "shift" comprises a foreman, who acts as engine-driver, four furnacemen, and one labourer. Besides the destructor there is also a carboniser, which is necessarily built in a different manner, as it is used to convert street-refuse and vegetable matter into a charcoal, which sells at the rate of 30s. a ton. The carboniser consists of a group of brick cells, each having a separate furnace. It is 26ft. long, 12ft. wide, and 15ft. 6in. high. The "shoot" is fitted with sloping plates, which project from its sides, and form a kind of spiral cave or ledge, which, near the bottom of the cell, takes the form of a fire-block, resting on a wall which divides the contents of the cell from the gases of the fire. The vegetable and other refuse to be converted into charcoal is filled into this shoot or well in a solid mass, the eaves, or ledges, forming on their underside a flue, so that the matter is gradually heated as it slips down the well, until, at the bottom, it is surrounded by nearly red-hot firebrick. The charcoal is withdrawn at the bottom, and is placed in a cooler worked by the steam-engine, and each cell is capable of treating 2½ tons of vegetable and street refuse in 24 hours. The cost of a complete establishment, with a six-celled destructor, an eight-celled carboniser, boiler, engine, mortar-mills, buildings, &c., is £4,500. No nuisance of any kind is experienced in the vicinity of the depots, and the refuse which might, under other circumstances, be deposited in places where it would become the hotbed of disease, is effectually destroyed or utilised.

New class-rooms added to St. Gabriel's School, Upper Easton, Bristol, were opened this week. The contract for constructing the new class-rooms was taken by Mr. E. M. Hodges, under the personal supervision of Mr. J. F. Trew. The style is Gothic, and the rooms are built of Cattybrook red and coloured-face bricks, with Westwood stone dressings.

Building Intelligence.

Halstead, Kent.—A new church, dedicated to Saint Margaret, was consecrated at Halstead, about four miles from Sevenoaks, on the 23rd ult. The church stands in the grounds of the cemetery, the chapel for which, erected about 30 years ago, being of suitable size and design, has been left intact, with the addition of an organ-chamber and vestry, and forms the chancel; a nave and aisle with south porch being now built to constitute the whole a parish church, supplying the place of the old one, which previously stood inside the park of Halstead-place. The church is in the style of the 13th century, accommodating a little over 200 persons. The reredos is executed by Mr. Griffiths, of London. Externally the walls are of faced flint, with red brick quoins, and dressings of Box Ground stone. The contract has been carried out at the price of £1,050 (the reredos and a few small extra works being additional), by Mr. Williams, of Harrington-square (formerly of Cardiff), under the direction of Mr. William Milford Teulon, architect, of 18, Upper Woburn-place.

Blackbrook, St. Helen's.—This neighbourhood has been long in want of school accomodation, &c. Messrs. Richard Evans and Co., of the Haydock Colleries, have erected on a prominent and advantageous site a large and substantial block of school buildings for boys, girls, and infants. The arrangements, besides the school-rooms, include class-rooms, galleries, lavatories, cloak-rooms, and spacious yards, &c. The latest improvements in desks, &c., have been adopted and supplied by Messrs. Colman and Glendinning. The schools are so arranged that meetings, otherwise than for school purposes, can be held in them if desired. The designs are by Mr. Edmund Kirby, architect, Liverpool, and the builder is Mr. William Owen, of that city.

Hillmaston, Wilts.—The parish-church was reopened on the 3rd inst., after having been restored from the designs of Mr. G. E. Street, R.A. The north aisle has been rebuilt 20in. wider than before, and the north arcade and its columns have been restored to a vertical position without being taken down. The under portion of the aisle-roof is of plain but massive pine, and it is covered with lead. The plaster ceiling and the roof of nave have been removed, and an open roof, covered with stone tiles, erected. The chancel has also a new open roof, and an organ-chamber has been erected, and the former oak sittings of chancel cut down and remodelled. The passages have been laid with tiles by Messrs. Godwin and Co., of Lugwardine. A new reredos, carved by Mr. Earp, of Lambeth, has been erected, and an elaborate altar-cloth has been worked by the ladies of 73, George-street, Portman-square. The Poynder family have promised to erect a memorial east window, by Clayton and Bell. The structural works have been carried out by Messrs. Smith and Light, of Chippenham.

COMPETITIONS.

Carlisle.—Several architects have, we understand, been selected to compete for the proposed new buildings of the Carlisle Grammar School, to be erected in Cuthbert's Close, Carlisle, under a new scheme. The instructions were finally settled last week, and provide that the school buildings are not to cost more than £10,000. The plans are to be sent in on or before the 20th April.

Brighton.—The new clock-tower competition at Brighton has attracted no less than thirty-nine competitors, and this number of designs have been received. The site of the intended structure is at the top of North-street, and the building is to include conveniences both for men as well as women, the latter to be on the first-floor. Above the first-floor, accommodation for a clock is to be provided in the tower, which is to be surmounted by a ball, 8ft. in diameter, arranged to be raised and lowered on a staff, 15ft. high, by means of electricity. A refuge is to be contrived outside the base of the tower, which is to be 25ft. from the ground to the central line of the clock-face. The clock is to have four illuminated faces, 5ft. in diameter. The total cost is restricted to £1,500, and the prizes are £20, £15, and £10 for the three selected designs, the drawings in these cases to become the absolute property of the Town Council.

Suffolk Lunatic Asylum, Melton.—The time for sending in plans for the erection of a new block of buildings at the Suffolk County Pauper Lunatic Asylum, at Melton, near Woodbridge, has been extended to April 1st. The plans are to provide accommodation for 150 patients, and are to be sent in to the committee at the County Hall, Ipswich.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

British Archæological Association.—The seventh meeting of the session was held on Wednesday week, the Rev. Dr. Sparrow Simpson, F.S.A., in the chair. Mrs. Jackson Gwilt exhibited a rubbing from one of the brasses in old Margate Church, executed by herself. It reprsents a priest of late date. Mr. R. Ferguson, F.S.A., described a painter's palette of Roman date, recently found near Maryport. It is a small flat slab of polished slate-like stone. Mr. Loftus Brock, F.S.A., described the progress of the discoveries at Leadenhall Market, where an extended length of Roman wall has been met with over 12ft. thick and going from east to west towards Gracechurchstreet. Some fragments of brilliantly-coloured fresco wall-painting were exhibited. Mr. T. Morgan, F.S.A., referred to the late Mr. Planché's report relative to Leadenhall, in which it is mentioned under the date 1315, some considerable time before it is referred to in the Histories of London. Dr. Phené, F.S.A., produced models in silver of two remarkably fine fibulæ recently discovered in Ireland. They are elaborately ornamented and have been jewelled. Some other Irish antiquities were shown, among which were some of crescent-like form, probably in reference to the worship of Astarte. Some neolithic stone implements bore evidence of use in war or the chase. The first paper was by the Chairman on "Representations of St. Paul's Cathedral in early MSS." The lecturer referred to a 14th-century MS. at Lambeth, where the lofty spire of the church is shown, and the ball on the summit, in which the relics were placed, in the belief that they would protect the spire from fire and tempest. A MS. in the Cottonian Collection shows the west front with fair details, as does also another MS. in the British Museum. The second paper was by Mr. J. Romilly Allen, F.S.A. (Scot.), on the early cross at Winwick, near Newton Bridge, Lancashire. Only the lateral arms remain of what was probably one of the finest of our ancient crosses. It is covered with elaborately-wrought fretwork patterns, similar to those of early date in Ireland and Wales. In the discussion which followed, Mr. Jas. Heywood, F.S.A., V.P., pointed out the frequency of Saxon and Danish names in the North of England. The proceedings were brought to a close by a paper by Mr. C. H. Compton on the Law of Treasure Trove, which was followed by an animated discussion. In course of the evening a communication from Mr. C. Roach Smith, F.S.A., was read, reporting the discovery of another "Honesta Missiones" inscription near Liège, and Mr. de Gray Birch, F.R.S.L., described the details.

SCHOOLS OF ART.

Penzance.—The group of buildings which have been erected for housing the Penzance school, which is taught by Mr. H. M. Geoffroi, were opened by the Mayor on Monday. They occupy a site on the Morral Fields, now being laid out for building purposes, and are Domestic Gothic in character. The external walls are of rubble masonry, with snail-creep jointing, and the dressings of cut granite. On the chief front are carved the badge of the Science and Art Department, and the borough arms. A vestibule leads to the principal room, which is 62ft. by 32ft., and 30ft. high from floor to ceiling. The lighting is from end windows to east and west, and from the north side. The walls are lined with pitch-pine dado, to a height of 4ft. from floor, and above this level are rough stuccoed. The main timbers of roof are open to ceiling, and are varnished. At the further end of the main room are the masters' and modelling rooms, each 15ft. square, and below these are store-rooms for casts, and heating-apparatus chamber. Mr. S. Trevail, of Truro, is the architect, and Messrs. J. N. Julian and Sons, of the same city, are the builders.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

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Received.—Capt. L.—H. and Co.—B. and S.—J. C.—W. S. and Co.—J. W. L.—R. S. W., jun.

One who Prefers to Submit his Work to Competent Men. (An isolated case of inefficiency is no argument against a system. The article you quote was not directed against individuals, but against the shortcomings of a system which renders such irregularities possible. Your proper course is to bring the case before the local board or sanitary authority of your district.)

"BUILDING NEWS" DESIGNING CLUB.

LIST OF SUBJECTS.

A. A cricket pavilion, containing, on the ground-floor, an assembly-room, refreshment-bar, conveniences, and an open verandah to be arranged in front. On the first-floor, provision to be made for a ladies' retiring-room, kitchen, pantry, and scullery, and a lift to refreshment-bar from kitchen. An external entrance to kitchen to be provided. Materials, brick and timber. Scale, 6in. to the foot.

B. A bedstead, a half-tester, in hard wood. 1in. scale and details.

Drawings Received.—Il faut Marcher avant du Courier, Juvenis, Nil Desperandum (2), Walter, Beta, Excel, Yarra Yarra, In hoc Signo Vinces, Ambition, Weaver, Jack, Fiat, Ogmore, Snow Flake, Norman, Tam O'Shanter, Per.

Correspondence.

STRATFORD-ON-AVON CEMETERY COMPETITION.

To the Editor of the Building News.

Sir,—In November last the Corporation of Stratford-on-Avon advertised for plans for laying out the grounds, and for designs for chapel and lodge for proposed new cemetery. In reply to the advertisement, there were 29 sets of drawings sent in. Probably some of the competing architects would like to know how the matter is progressing.

From the 29 sets of drawings sent, the one showing the most elaborate detail was chosen—certainly not for the arrangement of the plan, as no vestry was provided, and the waiting-room was nothing more than a porch. A place some 7ft. by 10ft., a door at each end, windows on each side with bench under, no fireplace. Second and third premiums were given to Stratford men, evidently by way of compliment, as the second premiated design showed the chapel and lodge in a line some 120ft. more or less from the road. There was about as much difference between the third and second premiated designs as between the first and second. Many very good designs were passed over.

Messrs. Wood and Kendrick, whose plans were selected, were instructed to obtain tenders for carrying out the work. This they did; but when these were laid before the Cemetery Committee, together with the working drawings, the latter could not be identified with the competition drawings. The handsome entrance-gates "which had been the admiration of all beholders," had been stripped of their attractiveness; in the windows the stone mullions had been omitted, and wood ones substituted; and many other alterations. From these drawings the quantities were taken; but the average amount of the tenders by far exceeded the amount laid down in the conditions. Under these circumstances the Cemetery Committee refuse to give the premium to Messrs. Wood and Kendrick. They in return complain of the harshness of the clause in the particulars relating to the sum proposed to be spent, and offer to obtain estimates from the competition drawings. This the committee are willing they should do, but Messrs. Wood and Kendrick refuse to do this, unless the committee put (as they say) a more reasonable construction on the cost-of-erection clause.

I think this is very unfair to the competitors, who took the trouble to prepare designs for a building that could be carried out for the sum stipulated in the conditions, and should very much like to see the opinion of other competitors. Cannot we league together, and do something to have the matter settled in a more just and satisfactory manner?—I am, &c.

£1300.

THE MANAGERS OF METROPOLITAN BUILDINGS.

Sir,—In your articles on District Surveyors you allege that they use their official positions to secure private business. I don't think that is correct. Speaking for myself, I may say that although I have been a district surveyor for nineteen years, yet I have never sought business; on the contrary, always refused it in my district. But were it otherwise, I could not act in a double capacity. I must report my engagement, and then another surveyor would be deputed to overlook my work; but it would be difficult to devise any system that should be so perfect, that no fault would be found with it.

Nor can I agree with you as to payment by salary: payment by results is much better, as it is a stimulus to activity and a fairer arrangement. In the years 1866-7-8, speculative building was very active; then came a panic from over-production, and it declined for several years. In 1873 it again began to revive, last year being the crowning year, and again we are on the eve of a panic—the largest that speculative building has ever passed through. Payment by salary would, therefore, be a mistake, as we may fairly expect a decline in production for some years to come. If all buildings supervised by the district surveyors were public buildings, payment to them from the public purse would be fair enough; but public buildings are few, private buildings numerous; and why A. should contribute to the district surveyor's salary, when, perhaps, he may never require his services, and B. and C. escape comparatively free, although employing him constantly, I cannot see. On the contrary, the incidence of taxation following services rendered seems to me a most equitable adjustment of burden; besides which, if men are disposed to go wrong, payment by salary would not stop them, and I cite as evidence a dismissal, not so very long since, of an important sub in Mr. Vulliamy's office. Then, as to collecting fees from the man whose work we survey, why not? Payment of fees is not a matter of favour, but an obligation; there need, therefore, be no concession.

The picture which you have drawn reads very much like an old quarrel about which some of us may have heard something before: but because two men at the west and two in the east fall out, I see no reason why fifty-eight others who keep the peace should be condemned; as amongst a body of men there will not be uniformity of temper and demeanour. The Metropolitan Board of Works has ample opportunity of choice whenever a vacancy occurs, and they appear to discriminate very well. But the world is living over again, and the satire of Aristophanes on Plato's Republic is yet applicable to our present daily life, "for they hate the old things"—that possibly is the gist of the whole thing. The institution works very well, but it's growing old, and so some say it should be destroyed.—I am, &c.,

T. E. Knightley.

2, The Grove, Hammersmith.

THE MOUNTAIN ASH LOCAL BOARD AND THEIR SURVEYOR.

Sir,—I am Surveyor to the above board, and engineer to their sewage scheme, which we have just completed.

I arranged to do the scheme for £120. After preparing plans and specifications, and submitting same for approval of the board, I recommended that they should advertise for an inspector, one that had acted as such on sewage works. The board dissented, having an old official as nuisance-inspector and rate-collector (who is a carpenter by trade); they selected him as inspector of the works at an additional salary of 24s. per week. I at once objected to the appointment, and publicly and emphatically stated that I would not take the responsibility of the work with such a man as inspector. After the works are completed, a certain member, who has a great animosity against me, makes an assertion that in many cases white lime is used instead of brown lime in the man-holes, and in many cases the joints of pipes have not fillet of cement on the clay; and wishes to make me responsible for anything that may be amiss. During the time that the sewage works were carried out, this board's boundary has been increased from 3,026 acres to 10,327 acres, which was strongly opposed before the Government Inspector and both Houses of Parliament. I have also carried a new road, through Parliamentary orders, all of which I have had to do without assistance. I therefore ask, even assuming I did not refuse to take the responsibility—Can a board hold an engineer responsible for the details of a scheme when he has more than he can do otherwise? If so, I utterly fail to see the object of appointing an inspector.—I am, &c. J. H. J.

Local Board Office, Mountain Ash, S. Wales, March 7th, 1881.

RE BOARD SCHOOL, ORPINGTON, COMPETITION.

Sir,—Though I have made inquiries in the locality, no one seems able to furnish me with any information as to the successful competitor in the above.

I may mention that the Board might have expressed their "thanks for competing" by returning drawings properly packed, correctly addressed, &c.

I trust the circumstances of this competition may be remembered when drawings are again advertised for by the same parties.—I am, &c.,

Competitor Dissatisfied.

A "PRACTICAL YOUNG ARCHITECT."

Sir,—Here is an advertisement, cut out of the *Church Times* of to-day:—

BUILDING.—A practical young architect will MAKE PLANS for NEW HOUSES, &c., or for Alterations, and superintend the work, if desired, for considerably less than the usual charge.—Address, Alpha, 18, Andover-road, Hornsey-road, London.

This young gentleman is on the high road to success, and we may live to see him President of the Institute, or at least a recipient of the gold medal.—I am, &c., Yankee Doodle.

March 4.

EXTERNAL SOIL-PIPES.

Sir,—Will you permit me to say that what Mr. Moxon mentions in his letter in your last issue as to the "spinning about" of a Banner Cowl, when it is improperly fixed, is quite correct. They ought always to be placed high enough, and so that eddies caused by projections, whether of chimneys or otherwise, are avoided. Then, as in the other case he alludes to, they will always act perfectly, though, even then, two near one another may not always be facing exactly the same way at the same time.

In your editorial, 18th ult., you say that cowls are not absolutely necessary. This, too, I can agree with in the same way, that it is not absolutely necessary to be rich in order to be happy; but we all strive to be the former in order the more completely to insure the latter. So in the case of

cowls: they render conditions which are otherwise of uncertain effect, and often unpleasant, to say the least, not only comfortable, but safe. In the words of many good authorities, "they undoubtedly help matters." In fact, if a proper soil-pipe be properly ventilated, it becomes practically a matter of small importance whether it be outside or, as mostly happens in existing houses, inside the house. The trap should be at the foot of the soil-pipe, and the inlet into the latter not less than 3ft. above the trap, and not less than 2½in. diameter.

In my opinion, the soil-pipe need never be more than 4in. for the largest house. At the Mansion House, I believe, one is 9in. diameter—about 5 times too large—and unventilated. The trap should be a close trap, and not a gully-trap in the drain, at a distance from the foot of the soil-pipe, as if so, we miss the cleansing force of water falling into it vertically from a height of several feet; besides which, in winter, ventilation is entirely suspended when the trap is covered with snow, &c., or the inlet with ice, in cases where the rain-water-pipe is improperly utilised for an inlet.

It is a fundamental error to suppose that there is a current of air up a vertical pipe, *per se*. The siphon action of water falling down a "long leg" is quite a different matter from that of air passing up a "long leg"; naturally air will as frequently pass down the long and out at the short pipe. Under proper arrangements the same air should not rest in the soil-pipe a minute.—I am, &c.,

Edw. G. Banner.

11, Billiter-square, E.C., March 8.

Sir,—Mr. White states that the explanations I gave on pp. 164 and 217 don't enable him to see how the inside soil-pipe can discharge more sewage-polluted air into the atmosphere than an outside one; nor how it can be worse in quality. Now in case he really does not understand this as yet, and as many more may be in the same condition, perhaps I may be allowed to give the following explanations:—

First. As to proof that the inside soil-pipe discharges the most bad air, the application of an anemometer to either the inlet or outlet end of the pipe shows that while the current is speeding through the inside pipe at the rate of from 100 to 400 lineal feet per minute, when we apply the same anemometer to the outside pipe we only get, at the most, perhaps, 20ft., and that irregularly; say, from no movement in the anemometer up to 20ft., or somewhat more or less, according to the position of the outside pipe and the motion of the wind, and whether or not it has an induced current ventilator upon it. It would be waste of your space to say more on this.

Second. In reference to the *quality* of the sewage-polluted air; that depends upon the contents of the interior of the soil-pipes, and their condition; and in this connection I find that Mr. White contradicts himself, for while at page 192 he admits that there are "accretions" upon the interior of the soil-pipes, yet at page 248 he says his "proposition supposes the pipe, whether external or internal, to be sound *and free from deposit*." Now this "proposition" of Mr. White that a soil-pipe from water-closets, after being some time in use, is "free from deposit" is a mistake. Vertical soil-pipes, after being a few weeks in use, begin to have a deposit within them, which deposit is not washed away by the ordinary flushing with water. To get it off, the soil-pipe would require to be swept by a special brush, as referred to by me in A.D. 1877 in one of my patents, where an illustration of such a brush is shown. Some soil-pipes accumulate deposit quicker than others, according to how they are used. A master-plumber in the South of England writes me that he had just taken out an old 5in. soil-pipe whose interior diameter was reduced to 3in., but this was in a hotel, and the beer would likely be to blame for 70 per cent. of this deposit. All Mr. White's arguments or ideas based upon soil-pipes being "free from deposit" are, therefore, fallacious.

As to Mr. White's assertion that "the more rapid the draught up the soil-pipe the less danger of the generation of foul air," I may say that I do not know what would be the effect if the draught were at the rate of thousands of feet per minute, but at the rate in soil-pipes *in actual use in ordinary houses* there is greater danger to the inmates from soil-pipe air blown into the house from an inside soil-pipe, especially if long, and the holes are near the upper bedrooms, than from an outside soil-pipe. An outside soil-pipe can be fitted up so that if a leak occurs inside of the house, only the air from three feet, or less, of the soil-pipe can come in; whereas with the inside soil-pipe, a leak inside the house means bad air from off 20, 30, or 40ft. of close, warm soil-pipe, consequently the danger is far greater with the soil-pipe inside than outside, *should an opening occur in the soil-pipe inside of the house*.—I am, &c.,

W. P. Buchan, S.E.

Glasgow, March 5.

P.S.—As to Mr. Charles F. Moxon's plan, page 248, of using his front soil-pipe as a fresh air inlet and his back soil-pipe as a foul air outlet, said plan is very dangerous *to the inmates* should a leak occur, because from his explanation both soil-pipes are in full connection with the drain passing through the house, and should his pipes go wrong the inmates of this house, altered by Mr. Moxon, are in danger of their lives. I know of a case something similar where the father and several of the family were taken ill, and the doctor blamed the up-cast soil-pipe, which was near the bedrooms and had a hole in it. The soil-pipe was put outside and trapped at its foot, and ventilated *per se* after this, while the drain passing through the house was ventilated by a special pipe put up outside at the back of the house. So long as the soil-pipe inside the house is sound, very bad sewage-polluted air may be flying up within it continually, and do the atmosphere of the house no harm, but so soon as one leak occurs, the poisoning of the inmates begins. So far as safety to the inmates is concerned, Mr. Moxon's style of ventilation is therefore a sham and a delusion, and for the good of the public the sooner this is understood to be the case the better for all concerned.—W. P. B.

DISTRICT SURVEYORS AND THEIR FEES.

Sir,—Permit me to offer an explanation in reference to certain remarks made by Alderman Sir Andrew Lusk, M.P., at the Mansion House Justice-room, upon the occasion of the withdrawal of a summons against Messrs. Trollope and Sons, and reported in your issue of the 5th inst.

The Alderman expressed surprise that I should have received fees in respect of works not within my district, and that I failed to attend the court to give evidence upon the summonses served upon me as a witness. The facts of the case are shortly as follows:—Last April, Messrs. Trollope gave notice of certain works in Nicholas-lane they intended erecting, on receipt of which, I referred to the District Map, and found the proposed works were clearly within my district. The buildings were surveyed during construction, and in November were completed, the account was rendered, and paid by Messrs. Trollope; subsequently, Mr. Collins claimed the fees, and much correspondence ensued; in the result he took out a summons against Messrs. Trollope for neglecting to give him, as district surveyor, the legal notice; this summons being heard on the 23rd ult., when the Ward Beadle of the adjoining Ward of Langbourne proved that the main portion of the buildings were within that ward. This evidence I accepted as against that of my map, and paid Mr. Collins his proportion of the fees.

In regard to the summonses and the alleged non-attendance to give evidence, allow me to remark that the first summons only came into my hands on the afternoon of the day the summons was returnable, and too late to enable me to give evidence. I attended the court on the second occasion, and met Mr. Collins, who expressed his willingness to settle the case. Together we proceeded to Mr. Wontner's office, where we met Mr. Trollope, and then to my office, where I paid Mr. Collins his proportion of the fees, upon the understanding that the summons against Messrs. Trollope was to be withdrawn, and my attendance as a witness dispensed with.

I regret having to trouble you with this letter, and must trust entirely to your sense of fairness to insure its insertion. On two occasions I have attended, with Mr. Morten, my counsel, the court to make this explanation, but both Sir R. W. Carden and Sir Andrew Lusk, while expressing sympathy, could hardly see their way to making the court a vehicle for a personal explanation.—I am, &c.,

Edward Power,

District Surveyor of the Southern Division of the City of London.

63, Queen Victoria-street, E.C., March 10.

CHIPS.

The annual exhibition of the Irish Fine Art Society was opened in Dublin on Monday. The pictures are not so numerous as last year, but are stated by the Irish papers to show an improvement in quality, while the society is now placed financially in a better position than at any previous period.

The Okehampton Local Board received last week draft plans for the sewerage of the town, prepared by Mr. Martin, C.E., of Exeter, and instructed him to prepare detailed plans and specifications; the estimated cost is £1,270.

An inquiry was held at Enniskerry courthouse on Saturday, before Mr. C. P. Cotton, inspector to the Local Government Board of Ireland, respecting a scheme of water supply for the village of Enniskerry. The plans have been prepared by Mr. Price, C.E., and will replace a supply from shallow wells by one from a deep bore in a solid bed of rock applied by a main. The scheme was opposed by the Dublin Corporation, who offered to supply their Vartry water, but it was objected that this would not reach the higher levels.

Intercommunication.

QUESTIONS.

[6423.]—**Chapel.**—In erecting a cemetery chapel, should it be set to Polar or magnetic compass point? The building is to be used for all religious denominations. If Polar, what is the present deviation?—Alpha.

[6424.]—**Plate Girder.**—Will some reader please give the dimensions of a plate girder to carry a distributed load of 12 tons over a 22ft. opening? Also for a cast-iron beam of the same span. The rules for above will greatly oblige.—W. McF.

[6425.]—**Sir George Gilbert Scott, R.A.**—In reply to Mr. Fred J. Freeman's question on "Cathedrals," some time ago, Mr. Irvine mentions the names of one or two gentlemen as likely persons to furnish a complete list of ecclesiastical and secular buildings on which Sir Gilbert was engaged. I am sure such a list would be most interesting to the readers of this valuable paper. The Editor has kindly promised to publish such a list. Will no one supply it?—Ecclesiologist.

[6426.]—**Bursting of Water-Pipes.**—In your paper of the 26th Feb. last is a letter from Mr. T. E. Julian, giving particulars of the means of preventing the bursting of water-pipes. I shall be glad if Mr. Julian or any of your readers can say whether the process he suggested is not the same as a Mr. Lyon has a patent for, and, if it is the same, has an owner of house-property the right of using the process for his own pipes if he has the work done by his own workmen?—An Estate Agent.

[6427.]—**Perspective of Shadows.**—Will any reader kindly explain the theory of the perspective of shadows, or recommend a simple and concise work on the subject?—H. A.

[6428.]—**Oak Fittings.**—What is the best kind of oak to use for internal fittings, such as bench seats, dados, counters, &c. I recently had some work carried out in British oak, which I vainly thought was the best. It was for some bank fittings, counters and desks and dados. I was greatly disappointed, and scarce could fancy it was oak. When fixed it was quite white, no grain or feather, coarse and raw-looking, and it splits and warps badly. I am told that English oak always looks bad at first, but this is now four years finished, and no improvement in appearance. They say Dantzic oak should have been specified, but I have no experience of it. What oak do cabinet-makers generally select?—B.

[6429.]—**Town Sewage Filters.**—Will some person kindly inform me, through the Building News, the best material for forming filters to sewage tanks, in order to make effluent fit to pass into a stream of water without being a nuisance?—Beta.

REPLIES.

[6395.] **Oak Paling.**—"X." has got a Riga oak paling exposed to weather, and wants to know the best way to preserve it, and retain at the same time the grain of the wood. A good plan is to oil it twice or thrice with linseed oil, and leave the rest to Providence. It is a pity that he did not use English instead of Riga oak. Our native oak will resist atmospheric influences far better than the softer-natured and more expensive Riga.—Harry Hems.

[6400.]—**Staining Pitch-Pine Green.**—Mr. Lascelles, of Bunhill-row, E.C., possesses an excellent receipt for doing this, which some little time ago, through the professional journals, he offered to impart to anyone interested—for a consideration.—Harry Hems.

[6406.]—**Felting a Roof.**—Referring to the answer of your correspondent "F.," I cannot see that it is absolutely necessary to board a roof first before laying felt, though it is certainly better work to lay boarding, and it is usually done.—Hugh McLachlan.

[6408.]—**Architectural Tour.**—Pettit's "Architectural Studies in France," Pugin and Le Keux's "Normandy," also Viollet le Duc's "Dictionnaire Raisonné de l'Architecture."—Hugh McLachlan.

[6410.]—**Clerk of Works.**—A contractor may order his clerk to make out the accounts of extras at the conclusion of works without employing a surveyor. An architect also may require the clerk of works to measure all extras during progress of works to check the contractor's account.—Hugh McLachlan.

[6413.]—**Green Slates.**—Elterwarter are the best both for colour and wear. They are used in many large buildings in London, including *The Times* office. In colour they are a splendid contrast to the darker kinds of slate, and look specially well on a red brick building. The address is—The Elterwater Green Slate Co. (Limited), Ambleside, Westmoreland.—Charles Bell.

[6414.]—**Trigonometry.**—The subject is treated in Baker's "Land and Engineering Surveying." Also in "Mr. Jackson's "Aids to Surveying Practice," both published by Messrs. Lockwood and Co. A very good book of mathematical tables is "Rules and Tables," by Professor Rankine, published by Griffin and Co.—G. H. G.

[6418.]—**Smoke Cure.**—I should prefer the pipe of admission of air to be introduced below the fire-grate. The plan suggested would tend to weaken draught. I should suggest contracting the throat of flue just above the register.—G. H. G.

[6419.]—**School-Boards and their Architects.**—"H. W. L.'s" question, if founded on an actual case, suggests inquiry. I believe, however, an amateur can prepare the design, and that it is only necessary to pass the rules of the Education Department.—G.

[6420.]—**Maintenance of Roadway.**—In reply to this question, there would be little or no saving to the ratepayers by reason of the centre of the roadway being kept up by a tramway company, as practical evidence may be adduced to prove that a tramway occasions extra wear in the sides or between the granite pitching and the gravelled parts. The objections made to new lines of

tramway appear to show this pretty plainly, as when the tramway is under repair the traffic is diverted to the sides, and ruts are thereby formed, besides other inconveniences. —G. H. G.

[6421.]—**Builder's Claim for Increased Depth in Foundations.**—The lateral and longitudinal slope of the ground ought to have been either shown or specified, in default of which a builder might make a claim for the difference in depth, as it would be clearly an extra. The acceptance of a tender does not compel a contractor to perform additional work. As regards the second question, the brickwork ought to be measured, and any extra labour to verge-pointing might be claimed. —G. H. G.

[6421.]—**Builder's Claim for Increased Depth in Foundations.**—A builder can claim, and should be paid, on all extras ordered during the progress of works by the architect or client. Also on work required to ensure safety of works, or to comply with legal demands of local authorities, should it be proved that such extra works were unforeseen, or have been omitted in the drawings or specification. It is usual to insert a clause in the general conditions of the specification to the effect that no extras will be allowed for unless ordered in writing by the architect, in which case a client's orders are nullified should the builder have signed the specification and initialed the pages where such clause occurs. Unforeseen necessary works must still, however, be paid for. Any works shown in drawings or specification, and not carried out, should be allowed for on the credit side of the account, and deductions made accordingly. A clause is usually further made in the general conditions providing for the rate at which extras and omissions shall be valued. The direct answer to your correspondent, therefore, is that the builder can legally claim for the extra excavation and concrete in foundations, for the extra thickness of gable wall, verge-pointing, and roof-flashing, also extra projection to slating or tiling of roof with cutting. On the other hand, deductions may be partially set against these, owing to the lower height of two last cottages.—Hugh McLachlan.

PARLIAMENTARY NOTES.

Subways.—Sir H. Verney last week asked the member for Truro whether, when a new street was formed, it was the habit of the Metropolitan Board at the same time to make a subway for containing gas, water, and other pipes, and whether the Board would use their endeavours to have subways made whenever they had the opportunity of doing so. Sir J. M'Garel Hogg: I beg to state that in forming new streets the Metropolitan Board have, when considered advisable, made subways for containing gas and other pipes, as in the case of the Victoria Embankment, Queen Victoria-street, Northumberland-avenue, Commercial-street, Whitechapel, Garrick-street, and Southwark-street. The great inconvenience, however, of disturbing existing arrangements would not, I think, justify the formation of subways in all cases, and I am not, therefore, prepared to say that the Board will on all occasions use their endeavours to have them made. Power is usually taken in the case of long and continuous improvements to form subways, and such power has been taken with regard to the new streets proposed from Charing-cross to Tottenham-court-road, and from Piccadilly-circus to New Oxford-street.

WATER SUPPLY AND SANITARY MATTERS.

Rostrevor, Co. Down.—On the 28th ult., the guardians of the poor of Kilkeel Union, as the rural sanitary authority, received tenders for the construction of waterworks in accordance with the plans and sections prepared by Mr. W. J. Watson, C.E., of Newry, for the supply of water to the village and district of Rostrevor. Eight tenders were received, and that sent in by Messrs. Gregg, Mooney, and Co., contractors, of Dublin, being the lowest, was accepted. The works will be commenced at an early date, and are to be carried out under the supervision of the author of the adopted scheme.

Water Supply at Prudhoe.—A Local Government Board inquiry was held at Prudhoe, Northumberland, on the 2nd inst., by Captain R. C. T. Hildyard, late R.E., respecting the granting of compulsory powers to enable the Hexham rural sanitary authority to carry out their Minsteracres water scheme for the supply of a population of 5,000 in the eastern portion of their district. Mr. J. S. Hodgson, C.E., engineer of the scheme, stated the estimated cost to be £11,216, inclusive of land purchase, engineering, and contingencies. The supply would be obtained from springs, and a drainage area of 280 acres, 1¾ miles from the nearest point to be supplied, and would be wholly by gravitation. The scheme provided for twenty gallons per head per day, or 100,000 gallons in all. The drainage area was on the millstone grit, beyond the area of the coal workings, thus insuring the permanence of the proposed supply. The scheme was opposed by the Duke of Northumberland and the Mickley Coal Company, and a counter-scheme, proposed by Mr. F. Rich, architect, Newcastle-upon-Tyne, was submitted in opposition to the authority's proposals. The cost of this was estimated at £7,130, a supply of 15 gallons per head per day being taken as the basis. The sources are on the coal formation, and, being at a considerably lower elevation than Minsteracres, it was proposed to supply the highest village (Mickley) by windmill power, by which that portion of the supply would require to be lifted 223ft. The inspector stated that the open service reservoirs in the opposition scheme would have to be covered, and announced his intention of going over the ground with the various parties interested after the disappearance of the snow. The inquiry lasted over six hours, considerable interest being manifested in the proceedings.

LEGAL INTELLIGENCE.

District Surveyors' Fees.—On Monday, Mr. Moreton, barrister, attended at the Mansion House on behalf of Mr. Power, a district surveyor of the City, to ask the Court to hear an explanation in answer to some remarks made in reference to his conduct in the case of Collins v. Trollope, recently before the Court. Sir Andrew Lusk said he was glad to hear that Mr. Power had an explanation, but as he did not put in an appearance before the court he could not enter into the matter then. He had no doubt that the explanation was a satisfactory one, and he advised Mr. Power to write to the newspapers.

Architects' Charges.—Paraire v. Loibl.—This was an action tried at Nisi Prius, before Lord Coleridge and a special jury, on Tuesday, which arose out of the improvements now being carried out by the Metropolitan Board of Works in Tichborne-street, and was for work done and services rendered by the plaintiff for the defendant, for which he now claimed £1,191 0s. 1d. The defendant paid £221 13s. 8d. into court as a sum sufficient to meet all the plaintiff's claims against him. It appeared that the plaintiff, who is an architect, was at various times employed by the defendant, M. Emil Loibl, the proprietor of the London Pavilion, to prepare certain plans and specifications for the alteration and improvement of his music-hall. In 1878 the Metropolitan Board of Works gave notice to Mr. Loibl that they intended to take and purchase these premises. The defendant's claim for compensation on this account was referred to Sir Henry Hunt and two umpires for arbitration, and he was finally awarded £109,000. This large award, the plaintiff alleged, was in some part due to the careful plans and drawings made by him of the premises, and also his valuable evidence on the case as an expert in such matters. He based his charges on the prevailing practice of his profession in like cases at 10s. 6d. per cent. Lord Coleridge observed as to this basis he would not hear of it, it was merely a question of *quantum meruit*. No body or society had any right whatever to fix their charges at certain sums and say they were to be paid. The more he saw of this case the more he felt it was one which might be settled. After a conference between the learned counsel, Mr. C. Russell said he would take a verdict subject to a reference. Verdict accordingly.

STAINED GLASS.

Cambridge.—Stained-glass windows have recently been placed in the chapel of Corpus Christi College, Cambridge: one on the north and one on the south side of chancel, immediately next the large east window (subjects: Christ Crucified and the Entombment). Each window is divided into panels, following the example of the glass as seen in the fine old window in the same chapel. The subjects represented are, on the north side, Christ bearing His Cross, in upper panel, and the Betrayal beneath; and on the south side, Christ's Appearance to Mary Magdalene in the Garden (Noli me tangere), and beneath, the Incredulity of St. Thomas. The windows were designed and executed by Messrs. Heaton, Butler, and Bayne, of London.

CHIPS.

On Friday last, at the Central Criminal Court, George Andrews, a master builder, of Nottinghill, was sentenced to four months' imprisonment for obtaining shortly before bankruptcy property of the value of £150 with intent to defraud a creditor.

On Sunday week the premises of Messrs. Lewis Brothers, Nottingham, were on fire. The utility of fireproof-floors was shown to great advantage in the fire, for there is no doubt whatever had it not been a gypsum cement concrete floor (Dennett's patent) in the room where the fire occurred, the entire stock and machinery of Messrs. Lewis Brothers, including the valuable horses, would have been destroyed. As it was, the damage done was not great.

Mr. William Hitchin, who for ten years past has been district surveyor to the Newark-on-Trent highway board, has been remanded by the local magistrates on a charge of forgery.

Our Office Table.

The House of Lords has confirmed the decision of the Court of Appeal that the Managers of the Metropolitan Asylums District have no authority under their Act of Parliament to set up at Hampstead a Smallpox Hospital, which is a nuisance infringing private rights. The Managers are thus made to feel more than ever the difficulty of discharging their duties towards sufferers from infectious and contagious disease in London. This case, which has been before the law-courts with varying fortune for many years, illustrates in a remarkable manner the difficulty of reconciling necessary care for the health of the whole community with sanctity of private rights. The result manifestly affects other large centres of population no less than London, and now that attention has been pointedly directed to the anomalous state of the law, it is likely that Parliament will be moved to put it on a different footing.

It is not often, probably, that prison-warders cultivate decorative design, or seek their inspirations from burglars under their care. An instance, however, took place a few months ago, in one of our London prisons, in which no less a personage figured than the notorious housebreaker who now awaits his trial in connection with the celebrated South Kensington burglary, committed a few weeks ago. This man, when in prison, was found to be an admirable housepainter, and was employed to paint the Governor's house, and other similar works. During this time one of the warders took part in a public competition for a decorative panel design, and finding the above prisoner was clever in such matters, the warder engaged his charge to prepare the competitive design for him. The drawing was sent in and won a prize for the warder, who was, of course, supposed to be the designer of the work. A disclosure, however, was made, and an appropriate punishment was inflicted on the competitive warder, who nearly lost his place. A more perfect example of "art needlework" has seldom been seen than one executed by a woman who has spent the best part of her life in London prisons for drunkenness. It was made entirely in prison, with a common pin, a piece of an old shirt, and the woman's own hair. The hair ornamentation was in every way good, and equal to the work of the most refined and cultivated designer. It was, however, only the work of a commonplace London "prison bird."

One of the handiest things we have seen for a long time is the "Fellows" file, invented and made by Mr. Charles Fellows, of Wolverhampton, for sorting, binding, and indexing letters, cards, invoices, orders, and other business documents. There are no springs, wires, or screws to get out of order. The documents are not perforated or damaged, and are kept quite clean. They need not be folded or endorsed, so that much office-work is saved. The "file" is durable, the arrangement for indexing simple and easily followed, and no man of business should hesitate to send to the inventor for a specimen of this simple but most convenient and indispensable help to order and regularity.

On Thursday week, at a meeting of the Court of Common Council, a report was brought up by Mr. Day from the City Lands Committee on the subject of the Temple-bar Memorial. It gave the history of the structure, the entire cost of which amounted to £10,696 6s. 7d.—namely, to Messrs. Mowlem and Co., for preliminary works, foundations, laying foundation-stone, scaffolding, granite work, masonry, boasting, carving, and modelling, £5,266 4s. 3d.; Mr. Boehm, A.R.A., for the two Royal statues, £2,152 10s.; Mr. Birch, A.R.A., for the griffin, £1,081 10s.; Mr. Mabey, for the models and bas-reliefs, £1,218 15s.; Mr. Kelsey, for a bas-relief, £385; Messrs. Baily and Son, for lamps, £450; Mr. S. A. Walker, for photographs, £39 9s. 6d.; and for draughtsmen, clerk of the works, and expenses, £102 18s. In addition there was a sum of £327 13s. 3d. for paving the street, which the committee thought should be paid by the Court of Sewers. Of the sum of £10,696 they had paid £5,650, leaving a balance of £5,046 to be paid. After much mutual recrimination between members of the Court, who begin to see how ridiculous they have made themselves, and others who are too deeply involved to admit their mistake, the report was received and referred back for execution.

AFTER much litigation, the Baroness Willoughby D'Eresby becomes the possessor of the famous signboard whereon David Cox painted an oak-tree, and which formerly hung in front of the inn of that name at Bettws-y-Coed, North Wales. The inn had been held by several tenants, and on an assignment by the last tenant, Lady D'Eresby, as the freeholder, claimed the painted panel. The Judge of the local County-court awarded it to her; the Chief Judge in Bankruptcy reversed the decision; and last week the Lords Justices decided that as the picture had not been removed by the original tenant, on a new lease being granted, it became the property of the landlord.

A NEW "Patent Window Sash-Lifter and Fastener," combined, manufactured by The Keighley Timber and Saw Mills Company, of Keighley, Yorks, appears to be a thoroughly good and practical invention. A want has long been felt by architects, builders, &c., for a cheap, simple and durable arrangement whereby sliding sashes may be opened and closed without having to resort to the primitive, insecure, and ultimately costly method of weights and cords. The K. T. and S. M. Company claim for their method that it entirely does away with the annoyance and expense of broken cords, as there are no cords used. It requires no fastening further than is contained in the "Lifter" itself; as in whatever position the sashes are left, whether open or closed, they are always perfectly locked—in fact, it is an automatic fastener, and the sashes may be left open a few inches during the night for ventilation with perfect security, it being impossible to move them up or down from the outside without breaking the window. The arrangement is simple, strong, and compact, each lifter being capable of lifting over 500lb.; it only occupies a space of about 3in. by 3in. by $1\frac{1}{4}$in. at the back of the frame stile of windows; it is next to impossible for it to get out of order, and being entirely constructed of metal, it will last for a generation without repair.

THE patented system of water-softening and purifying, invented by Messrs. Atkins and Co., of Fleet-street, is being taken up by a limited company, under the auspices of an influential directorate, with Lord Ashley, Sir George Innes, and others thereon. The company has also the option of taking over that part of Messrs. Atkins' business which consists of the manufacture of cistern-filters. Both undertakings are of a thoroughly sound and genuine character, and if properly managed, there can be no doubt a lucrative business is to be done by the new company. The capital is £100,000, in pound shares, of which 13,750 shares have been allotted to the patentees, as part payment, and the remainder are offered to the public. The patent has been successfully applied in many important buildings, and is about to be adopted at H.M. Dockyard at Portsmouth. The apparatus is simple and cheaply worked, and of great public utility.

Epps's Cocoa.—Grateful and Comforting.—"By a thorough knowledge of the natural laws which govern the operations of digestion and nutrition, and by a careful application of the fine properties of well-selected Cocoa, Mr. Epps has provided our breakfast tables with a delicately-flavoured beverage which may save us many doctors' bills. It is by the judicious use of such articles of diet that a constitution may be gradually built up until strong enough to resist every tendency to disease. Hundreds of subtle maladies are floating around us ready to attack wherever there is a weak point. We may escape many a fatal shaft by keeping ourselves well fortified with pure blood and a properly nourished frame."—*Civil Service Gazette.*—Sold only in Packets labelled—"JAMES EPPS and Co., Homœopathic Chemists London."—Also makers of Epps's Chocolate Essence for afternoons

CHIPS.

At a meeting held at Westwell, Kent, on Thursday week, it was decided to restore the parish church, a 13th-century structure in a decayed condition, in accordance with plans to be prepared by Mr. Ewan Christian, and committees were appointed for this purpose.

The fourth annual dinner of the Portsmouth and South Hants Builders' Benevolent Association was held on Monday week at Portsmouth, the President, Mr. W. Pink, mayor of the borough, in the chair.

Mr. Henry Hatfield, of Blackheath-hill, died on Wednesday week, aged 56 years. For 35 years he had been in business as a builder and decorator, and was a churchwarden of Holy Trinity, Greenwich, and a member of the Greenwich Vestry and Board of Works.

The town council of Bath discussed at their last meeting the special charges made by Mr. Davis, city architect and surveyor, of 5 per cent. commission on the drainage work recently carried out at the baths. A committee's report recommended the payment of the commission, amounting to £150, in addition to £21 for plans, to which an amendment was moved that a grant of £200, plus the £21 for plans, be made. Some members opposed the making of any extra payment, but on a division being taken the committee's recommendation that £171 be paid Mr. Davis was carried by 20 votes to 5.

At yesterday's meeting of the London School Board the works' committee reported that as a result of the interview between Mr. Robson, architect to the Board, and the architect to the Education Department, the Department had agreed that for the schools in the metropolis the cost of boundary walls and the tar-paving of playgrounds need not be included within the £10 per head limit, to which expenditure has been restricted since August, 1878. This will enable the London School Board to again insert some of the items in contracts which they consider necessary, but which were omitted when the cost was limited by the Department.

Lamplough's Pyretic Saline is refreshing, most agreeable, and the preventive of FEVERS, BILIOUSNESS, SMALL POX, SKIN DISEASES, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill. *Use no substitute* —[ADVT.]

Holloway's Ointment should be well rubbed upon the pit of the stomach and region of the heart in that particular form of indigestion which gives rise to palpitation, shortness of breath, and a suffocating sensation. Every distressing symptom soon yields, digestion becomes easy, the spirits light, and good health returns.—[ADVT.]

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—London Institution. "The Gold and Silver Mines of the World." By G. Phillips Bevan. 5 p.m.
Royal Institute of British Architects. Special meeting for the award of Prizes. 8 p.m.
Society of Arts. Cantor Lecture No. 2, on "The Scientific Principles Involved in Electric Lighting." By Prof. W. G. Adams, F.R.S. 8 p.m.

TUESDAY.—London Institution. "Sanitary Assurance." By Dr. F. de Chaumont, F.R.S. 8 p.m.
Institution of Civil Engineers. Discussion on Sir W. Thomson's Tide Gauge, Tidal Harmonic Analyser, and Tide Predictor. Paper on "The Comparative Endurance of Iron and Mild Steel when Exposed to Corrosive Influences." By D. Phillips, M.I.C.E. 8 p.m.

WEDNESDAY.—British Archæological Association. "Recent Discoveries at Reading." By Dr. Jas. Stevens. "Roman Pottery Kilns at West Stow." By H. Prigg. 8 p.m.

THURSDAY.—Royal Institution. "Ornament." By H. H. Statham, F.R.I.B.A. 3 p.m.
London Institution. "The Combination of Voices with Instruments." By Dr. W. H. Stone. 7 p.m.
Civil and Mechanical Engineers' Society. "House Drainage and Sewerage." By R. E. Middleton, A.M.I.C.E. 7 p.m.
St. Paul's Ecclesiological Society. "Ornaments of the Altar in Western Europe." By Major Heales, F.S.A. 7.30 p.m.

FRIDAY.—Architectural Association. "Holland." By R. Phené Spiers, F.R.I.B.A. 7.30 p.m.
Royal Institution. "Musical Pitch." Dr. W. H. Stone. 9 p.m.

Doulting Freestone and Ham Hill Stone of best quality. Prices, delivered at any part of the United Kingdom, given on application to CHARLES TRASK,
Norton-sub-Hamdon, Ilminster, Somerset.
—[ADVT.]

McLACHLAN & SONS, 35, St. James's-street, S.W. Builders, Decorators, and House Painters. Designs and Estimates.
General Repairs and Alterations Executed. Experienced Workmen always in readiness, and sent to any part of the country.—[ADVT.]

BATH STONE.
SUMMER DRIED,
CORSHAM DOWN,
100,000 Feet Cube.
PICTOR & SONS, BOX, WILTS.
[ADVT.]

TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender—it adds to the value of the information.

BRIGHTON.—For premises, King's-road and West-street, Brighton, exclusive of the doors, and dressings, and chimneypieces of the one, two, three, and four pair floors and of the shop-fronts. Messrs. Lainson and Son, architects. Quantities supplied by Messrs. Fowler and Hugman:—

Colls and Sons	...	...	£12,800 0 0
Cheeseman and Co	...	...	12,500 0 0
Crockett	...	...	12,392 0 0
Kirk and Randall	...	...	11,343 0 0
Jones and Co	...	...	10,840 0 0
Barnes (accepted)	...	...	10,344 0 0

BERMONDSEY, S.E.—For the enlargement of the Monnow-road school, Bermondsey, by 400 places, and for various additions to the existing school, for the London School Board. Mr. Robson, F.S.A., architect to the board:—

Atherton and Latta	...	...	£6,300 0 0
Chappell, J. T.	...	...	5,980 0 0
Shepherd, W.	...	...	5,930 0 0
Cox, C.	...	...	5,899 0 0
Williams, G. S. S. and Son	...		5,838 0 0
Roberts, L. H. and R.	...	...	5,819 0 0
Nightingale, B. E.	...	...	5,781 0 0
Jerrard, S. J.	...	...	5,743 0 0
Grover, J.	...	...	5,672 0 0
Higgs and Hill	...	...	5,590 0 0
Kirk and Randall, Woolwich*	...		5,584 0 0

* Accepted.

[Cost of (*a*) new classrooms, £2,002: (*b*) tar pavement and playgrounds, £210; (*c*) boundary walls and gates, £178; (*d*) covered playgrounds, £400; (*e*) cloakrooms for whole school and new staircases, £1,030; (*f*) rebuilding w.c.'s for boys and infants for existing school, and also coalcellar, £334; (*g*) works to existing buildings, new corridors, &c., £1,430; total, £5,584. Cost per head of (*a*) to (*d*), £6 19s. 6d.; total cost per head of enlargement, £13 19s. 2d.; total cost per head of complete school, £10 12s. 10d.]

BRISTOL.—For the erection of stables, warehouse, and dwelling-house, Back-street, for Mr. Jeptha Feltham. Mr. W. Cloutman, surveyor. Quantities by the surveyor:—

Gorvett, W.	...	...	£1,190 0 0
James, J.	...	...	1,170 0 0
Wilkins and Sons	...	...	1,150 0 0
Eastabrook and Sons	...	...	1,115 0 0
Davis, J.	...	...	1,115 0 0
Humphries, G.	...	...	1,111 0 0
Hatherly, E. and T.	...	...	1,094 0 0
Pitt, B.	...	...	1,080 0 0
Beaven and Brown	...	...	1,077 0 0
Cowlin and Sons	...	...	1,075 0 0
Davey, R.	...	...	1,074 15 0
Dubin, W.	...	...	1,058 0 0
Hill, T.	...	...	1,056 0 0
Veals, W.	...	...	1,044 0 0
Church, W.	...	...	1,043 0 0
Parrott, J.	...	...	1,035 0 0
Hodges, E.	...	...	1,030 0 0
Hayes, C.	...	...	1,025 0 0
Cowlin, S.	...	...	1,020 0 0
Banner, W.	...	...	1,010 0 0
Tucker, T.	...	...	979 10 0
Beaven, T.	...	...	920 0 0
Sharp and Graham	...	...	838 4 6
Crick, J. (received too late)		...	994 0 0

CAMDEN TOWN, N.W.—For the enlargement of the Brecknock school in York-road, Camden Town, from 600 to 1,000 school-places, for the London School Board. Mr. E. R. Robson, F.S.A., architect to the board:—
Wall, Bros., Kentish Town (accepted) ... £2,484 0 0

[Messrs. Wall Bros.' tender was accepted in April last at £5,236, for the erection of this school to accommodate 600 children, and the present tender is based on the contract schedule of prices. Cost of (*a*) new rooms, including closets, £2,382; (*b*) tar pavement, playground, and drains, £48; for special expenses chargeable to site: (*c*) additional depth of foundations, £54; total, £2,484. Cost per head of enlargement, £6 4s. 2d.]

CARDIFF.—For the erection of a school in Stacey-road, for the Cardiff School Board. Mr. Peter Price, of Cardiff, architect:—
Purnell and Fry (accepted) ... £7,150 0 0
[Cost per head for school-buildings, including covered playground and caretaker's house, but not purchase of site, £17.]

CARDIFF.—For the erection, in the Broadway, Roath, near Cardiff, of a public hall:—
Lewis, of Roath (accepted) ... £2,000 0 0

CORK.—For main drainage works, Cork District Lunatic Asylum. Mr. William H. Hill, architect:—
O'Flynn, E. and P. P. (accepted) ... £759 0 0

COSHAM.—For alterations and additions to board school at Cosham, Hants, for the Widley and Wymering School Board. Mr. George Rake, Portsea, architect:—

Burbidge, Southsea	...	...	£1,102 0 0
Light, Bros., Landport	...	...	1,095 0 0
Whiting, Gosport	...	...	1,058 12 0
Earwaker, Southsea	...	...	879 0 0
Stallard, Havant (accepted)		...	869 10 0

DEWSBURY.—For the erection of Bridge Mills, Savile Town. Messrs. John Kirk and Sons, architects, Huddersfield and Dewsbury. Accepted tenders:—
Masons:—
Brier, Sons, and Wilson, Savile Town.
Joiner:—
Edward Chadwick, Staincliffe.
Plasterers:—
T. Johnson and Son, Mirfield.
Plumber and Painter:—
W. Summersgill, Ravensthorpe.
Slaters:—
Rawsthorne and Co., Dewsbury.
Ironfounders:—
G. and J. Horsfield, Dewsbury.

DURHAM.—For the improvement of Flass-street, for the city council:—

Ainsley, R., Durham	...	...	£196 2 0
Carrick, J., Durham	...	...	175 0 0
Simpson, J. T., Newcastle-on-Tyne*			169 1 8

* Conditionally accepted.

EASTBOURNE.—For "Shone's Sewerage System" at Eastbourne. Mr. Charles Tomes, surveyor:—

Fowler, G.	...	...	£2,290 14 3
Hayward, J. (accepted)		...	2,077 7 4
Crowe (informal)	...	...	1,830 0 0
Repairs to sewer outfall:			
Hayward, J. (accepted)	...	...	£403 9 6

EPSOM.—For house, Worple-road, Epsom, for Joseph J. Caney, Esq. Mr. J. Hatchard Smith, A.R.I.B.A., architect, 41, Moorgate Station-buildings, E.C.:—
Pyke (accepted) £1,140 0 0

EAST DULWICH.—For the erection of new house and stables in the Barry and Underhill Roads, for Dr. Lockhart Lawson. Messrs. H. H. and R. Francis, architects:—

	House.	Stables.
Yerbury	£2,166 0 0	£346 0 0
Heather and Laws	1,180 0 0	170 0 0
Wilkins* (Peckham)	1,165 0 0	160 0 0

(*Accepted)

EPSOM.—For boundary wall, stable gates, front fencing, &c., Downs-road, Epsom. Mr. J. Hatchard Smith, A.R.I.B.A., architect, 41, Moorgate Station-buildings, E.C.:—

Jeal (accepted)	£245 0 0

FOREST GATE.—For additions and alterations at Forest Gate school. Mr. W. A. Longmore, architect. Quantities by Messrs. Goodchild:—

Coulter, W. H.	£6,145 0 0
Barton	5,436 10 2
Wood, G. J.	5,300 0 0
Jones, D. C. and Co.	5,170 0 0
Wood, H. F. J.	4,994 0 0
Ward, R. and Lamble	4,932 0 0
Little	4,820 0 0
Hunt, J. R.	4,759 0 0
Nightingale	4,741 0 0
Cass and Beldon	4,720 0 0
Harris and Co.	4,696 0 0
Judd	4,679 0 0
Gregar, W.	4,639 0 0
Hearle	4,569 0 0
Gentry	4,540 0 0
Bentley, J. (accepted)	4,450 0 0

FOREST GATE.—For alteration, &c., Princess Alice publichouse, Forest-gate. Mr. Wesley, architect:—

Page	£860 0 0
Shurmur	725 0 0
Johnson	720 0 0
Taylor and Parfitt	709 0 0
Walker	695 0 0
Palmer	665 0 0
Beale	648 0 0

GELLIGAER.—For scavenging the district of Pontlottyn, during one year, for the Gelligaer highway board:—

Davies, Wm. (accepted)	£60 0 0

HACKNEY.—For additions and stables to Sutton Lodge, Hackney. Mr. John Hamilton, architect:—
Shurmur (accepted).

HACKNEY.—For internal fittings and partitions, &c., to Nos. 22, 24, 26, 30, and 44, Bank-buildings, Hackney. Messrs. W. Waymouth and Son, architects:—
Shurmur (accepted).

HAMPSTEAD.—For alterations and additions to Burgh House, Hampstead, for G. Rooth, Esq. Mr. J. T. Newman, architect, No. 2, Fen-court, Fenchurch-street, E.C.:—

Reed, A.	£697 0 0
Berry, B.	684 0 0

HOLSWORTHY.—For the second and last portion of the drainage works, for the rural sanitary authority of Holsworthy, Devon:—

Gibson, W., Exeter	£574 0 0
Harris, T., Okehampton	480 0 0
Beckley, W., Holsworthy	369 0 0
Lish and Penwarden, Holsworthy*	325 0 0

* Accepted.

HOXTON.—For alterations and additions to the "White Hart," Hoxton, for Mr. E. J. Rose. Messrs. Wilson, Son, and Aldwinckle, architects:—
Shurmur (accepted).

HOYLAND.—For improvements to Field-lane, for the Hoyland highway board:—

Hague, Josh	£237 10 0
Hemingway, H.	185 0 0
Parr, John	180 10 0
Heywood, John	125 14 9
Hague, John (accepted)	109 9 0

ILFRACOMBE.—For the new waterworks. Amended tenders:—

Craws, Bridgewater,	£2,251 0 0
Collins, Ilfracombe (accepted),	2,039 0 0

KENTISH TOWN.—For the erection of stabling, &c., for the London General Omnibus Company, at Cathcart-street, Kentish Town. Mr. A. Josh, architect. Quantities by Mr. Bolton:—

Drake, Bros.	£3,750 0 0
Frost and Co.	3,725 0 0
Steed, Bros.	3,500 0 0
Ashwell	3,469 0 0
Lucas and Son	3,266 0 0
Higgs	3,098 0 0
Coulter	3,079 0 0
Crockett	3,069 0 0
Richards	2,979 0 0
Niblett	2,959 0 0
Parker	2,880 0 0
Hammond	2,800 0 0
Ward and Lamble	2,797 0 0
Judd	2,777 0 0
Garrud	2,751 0 0
Beale	2,718 0 0
Richeirs and Mount (accepted)	2,660 10 0

LAMBETH, S.E.—For the enlargement of the East-street, Lambeth, school, by 400 places, and for additional cloak accommodation for the existing school, for the London School Board. Mr. E. R. Robson, F.S.A., architect to the board:—

Hobson, J. D.	£4,139 0 0
Brass, W.	3,979 0 0
Kirk and Randall	3,953 0 0
Jerrard, S. J.	3,949 0 0
Higgs and Hill	3,792 0 0
Nightingale, B. E.	3,773 0 0
Tongue, W.	3,772 0 0
Shepherd, W.	3,676 0 0
Grover, J.	3,644 0 0
Atherton & Latta, Poplar (accepted)	3,630 0 0

[Cost of (*a*) school buildings only, including closets, &c., £2,803; (*b*) tar pavement and playground, £60; (*c*) boundary walls and gates, £95; (*d*) additional cloak accommodation for entire school, £437; special expenditure chargeable to site; (*e*) works to existing buildings, £180; (*f*) making good adjoining property, £55; total, £3,630. Cost per head of (*a*) to (*c*), £7 7s. 11d.; total cost per head of enlargement, £9 1s. 6d.]

LEICESTER.—For lodges and entrance-gates to the Abbey Park, Leicester, for the Corporation. Mr. J. Tait, architect:—

	Lodges.	Entrance gates, &c.
Cox	£1,369 0 0	£416 3 6
Hayes	1,367 0 0	364 9 0
Bass	1,270 0 0	167 13 0
Stirk	1,260 8 6	365 15 0
Jewsbury	1,214 0 0	319 0 0
Hewitt, H.	1,210 0 0	347 0 0
Elliott	1,198 17 0	335 0 0
Major	1,167 17 0	310 0 0
Hutchinson	1,163 0 0	359 0 0
Hewitt, G.	1,139 0 0	325 0 0
Kellett (accepted)	1,113 10 0	303 10 0

LONDON.—For rebuilding the "Half Moon," Gracechurch-street, for J. T. Porter, Esq. Messrs. Taylor and Larke, architects, St. Michael's House, Basinghall-street, E.C. Quantities by Mr. William Birdseye:—

Kirk and Randall	£12,657 0 0
Gill, F.	11,963 0 0
Bangs, W. and Co.	11,820 0 0
Merritt and Ashby	11,713 0 0
Brass, W.	11,685 0 0
Ashby and Horner	11,590 0 0
Conder, R.	11,510 0 0
Boyce, T.	11,440 0 0
Morter, J.	11,089 0 0

LONDON.—For various small works. Messrs. Ebbetts and Cobb, architects, Savoy House, 115, Strand, W.C.:—

At Kensington:—	
Steel Bros.	£84 8 0
At Kensington (mantel-piece):—	
Wilkins	35 0 0
Steel Bros.	29 0 0
At Hornsey:—	
Steel Bros.	42 18 0
At Islington:—	
Fullbrook	30 0 0
At City-road:—	
Steel Bros.	28 0 0

MABLETHORPE, LINCOLNSHIRE.—For alterations to the Wesleyan chapel at Mablethorpe:—

Moore, Louth	£387 10 0
White and Wood, Alford	355 0 0
Kidd, Alford	349 0 0
Sargeant, Mablethorpe	335 0 0
Holmes, Wainfleet	317 0 0
Horton and Dabb, Mablethorpe*	294 0 0
Hobson and Harrison, Hogsthorpe	280 0 0

(*Accepted)

MANSFIELD.—For the erection of a gas-holder, for the improvement commissioners:—

Horsley and Co., Birmingham*	£2,000 0 0
Smedley, Bros., Belper	1,900 0 0

* Accepted.

NEWPORT.—For new offices, for the Newport harbour commissioners. Mr. E. A. Lansdowne, architect, 26, High-street, Newport, Mon.:—

	In Free-stone.	In Forest stone.
Stephens and Bastow, Bristol	£1,799 0 0	£1,929 0 0
Eastabrook and Sons, Bristal	1,772 0 0	1,924 0 0
Firbank, Newport	1,772 0 0	1,924 0 0
Jones and Son, Newport	1,587 0 0	1,835 0 0
Hatherley, Bristol	1,694 0 0	1,831 0 0
Burgoyne, Blaenavon	1,750 0 0	1,800 0 0
Thomas, G.	1,689 0 0	...
Moulton and Brownscombe, Newport	1,635 0 0	1,745 0 0
Wilkins, Newport	1,550 0 0	1,740 0 0
Thomas, R. L., Newport	1,650 0 0	1,720 0 0
Miles	1,494 0 0	...
Blackburne	1,433 0 0	1,655 0 0
Linton	1,455 0 0	1,645 0 0
Richards	1,439 0 0	1,599 0 0
Martin	1,413 0 0	1,573 0 0
Orphan	1,391 0 0	1,541 0 0
Francis	1,479 0 0	1,519 0 0
Williams, J.	1,310 0 0	1,380 0 0

NEWPORT.—For alterations to offices, for Newport Dock Co. Mr. E. A. Lansdowne, architect, 26, High-street, Newport, Mon.:—

Linton	£230 0 0
Miles	194 0 0
Francis	160 0 0

ROSTREVOR, Co. DOWN.—For construction of waterworks for supply of village and district of Rostrevor. Works comprise storage reservoir, regulating tank, and supply and laying of iron pipes. Mr. Wm. James Watson, C.E., architect, Newry. Quantities supplied:—

Simpson, R., Dublin	£3,933 3 9
Carlisle, R., Belfast	3,446 7 0
Daniels and Co., Dublin	3,082 0 0
Collen Bros., Portadown	3,050 0 0
McAlcanan, J., Castlewellan	3,027 15 0
Mahood and McMurray, Newry	2,974 18 0
Wheelan, A., Newry	2,753 0 0
Gregg, Mooney and Co., Dublin*	2,734 0 0

* Accepted.

SHARDLOW.—For the erection of stables for the Shardlow board of guardians:—

Brooks, Sawley	£190 0 0
Dean, W. and J., Derby	181 15 0
Saunders and Co., Derby	149 0 0
Rimington, T. Derby	144 15 0
Wood, Jno., junr., Derby (accepted)	131 17 6

SHEERNESS-ON-SEA.—For a new boiler for the Well Committee of the local board:—

Butler and Co. (accepted),	£170

SIDCUP.—For ironmongery, smiths' and plumbers' work to finish three houses at Sidcup for Mr. Wells. Messrs. Ebbetts and Cobb, architects, Savoy House, 115, Strand, W.C.:—

Eddowes, Old Kent-road	£235 19 5

ST. GEORGE'S-IN-THE-EAST.—For the cleansing, dusting, and scavenging work of the parish, for the vestry:—

	For 1 year.	For 3 years.
Harris	£4,150 0 0	...
Parsons	3,980 0 0	£11,940 0 0
Abbott*	3,890 0 0	11,600 0 0

* Accepted at £3,850 for one year.

ST. GEORGE'S-IN-THE-EAST.—For watering the streets of the parish, for the vestry:—

Harris	£320 0 0	...
Parsons	280 0 0	£840 0 0
Abbott*	250 0 0	740 0 0

* Accepted.

STRATFORD.—For the erection of "The Three Choppers" Coffee Tavern, Stratford, E., for Andrew Johnstone, Esq., J.P. Mr. J. T. Newman, architect, No. 2, Fen-court, Fenchurch-street, E.C. Quantities supplied by Messrs. R. L. Curtis and Sons:—

Hosking, G.	£1,212 0 0
Morter, J.	1,198 0 0
Reed, A.	1,183 0 0
Norton and Son	1,175 0 0
North, Bros.	1,125 0 0
Hearle and Son	993 0 0

TOOTING, S.W.—For the erection of a school to provide accommodation for 600 children on the site in Merton-road, Tooting, for the London School Board. Mr. E. R. Robson, F.S.A., architect to the board:—

Marsland, J.	£6,996 0 0
Nightingale, B. E.	6,991 0 0
Tyerman, J.	6,897 0 0
Higgs and Hill	6,840 0 0
Stimpson and Co., Brompton-rd.*	6,682 0 0

* Accepted.

[The cost of this school will exceed £10 per head, owing to the fact that, although provision will only be made at present for 600 children, the building has been planned with power of extension; and cloak-rooms will be provided for a school for 1,000 children. Cost of site (area 22,335 square feet), £3,834 17s. 4d.; cost of (*a*) school buildings only, including closets, £5,200; (*b*) tar pavement and playground, £247; (*c*) boundary walls and gates, £255; (*d*) teachers' rooms, £300; (*e*) schoolkeeper's residence, £350; for special expenditure chargeable to site, viz.: (*f*) extra depth of foundations, £280; (*g*) repairs to adjoining proprerty, £50; total, £6,682. Cost per head of (*a*), (*b*), and (*c*), £9 10s.; total cost per head, £11 2s. 8d.]

WEST HAM.—For the erection of new coal stores and Retort House, at West Ham Gasworks, Stratford. Mr. H. Harman, engineer. Quantities by Messrs. Franklin and Andrews:—

Lawrence	£8,250 0 0
Bangs	8,078 0 0
Cox	8,073 0 0
Wood Bros.	7,863 0 0
Fish	7,847 0 0
Ashby	7,500 0 0
Perry and Co.	7,226 0 0

WEST HAM.—For construction of and fixing iron roof to Retort House, at West Ham Gasworks, as above:—

Fraser Bros.	£975 0 0
Thames Ironworks Co.	960 0 0
Howard	896 0 0
Cutler	888 0 0
Appleby Bros.	875 0 0
Horseley Iron Co.	825 0 0

For remainder of TENDERS, *see p.* XVIII.

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THE BUILDING NEWS.

LONDON, FRIDAY, MARCH 18, 1881.

FAÇADES.

A STRANGER making notes of our London street architecture must be smitten by confusion of ideas with respect to style, for he must soon observe we have no settled principles of design, even as regards one school. What are called, somewhat vaguely, "Classic" buildings, will be found to comprise such widely-different modes of treatment, that it would be hard to say which features could be really designated Classical. This difficulty is increased by the freedom assumed by those who work in the later phases of English Classic, and follow semi-Dutch or Queen Anne models, and we have to look for some apparently trivial feature to distinguish the work of such architects from Late Gothic. We are not going to complain of this wide divergence of style; it shows, at least, a certain amount of life and vigour, and a throwing off the shackles of mere academicism, always a blighting influence on art, as on life and thought. The use of brick for buildings in this Semi-Classic style has rather widened the breach between it and the purer forms of the school, and we have already noticed the bearing of this fact. It may be well, too, to take note of another fact, namely, the facilities afforded by the low-relief features of this style for the employment of moulded brick and terra-cotta, and the importance of making our ordinary street façades depend chiefly on features that will not harbour soot and dirt in irregularities of surface.

A walk through many of our streets will show how steadily the employment of brick has advanced from the crude idea that all relief in it was to be obtained by surface ornament, tiles, and stone dressings, to the recognition of a more substantial style, depending on the free use of cut and moulded brickwork. In Farringdon-street, one or two massively-built façades have been erected, which show a bolder handling of the material; but, turning from these more prosaic buildings to Messrs. Howell and James's new façade in the Haymarket, it will be seen how the material can be used in the more elaborate forms of street architecture. The new façade is of red brick and terra-cotta, the latter being used in the window mullions, transoms, pilasters, and pediments of the third-floor windows. The design is, perhaps, more in the spirit of Renaissance; the relieved ornament in the pilasters and panels is delicate, yet rich, though the proportions and some of the features are more Old English or Jacobean in character. We may instance this façade as an example of what may be accomplished in the fronts of commercial buildings in good thoroughfares without the use of stone. In New Bond-street a few new façades may be noticed, built entirely of brick, in a similar style, with Semi-Classic features. It may be said, and justifiably, that some of these betray an ephemeral fashion which will never survive even some of the more modest buildings by their side, that they are dishonest imitations of an age in which small panes of glass and Dutch fancies prevailed; but we draw attention not to their style, but the freer use of brick in the formation of features which architects once thought could not be wrought in it. Less elaborate than the new façade in the Haymarket, but effective and solidly carried out, is a narrow front in Maddox-street, to the New Museum of Building and Sanitary Appliances. The style is Semi-Classic but more English; the windows are carried up in vertical continuous bays, and the façade is terminated by a gable of curvilinear form in cut brickwork. The only stonework is the corbelling of balcony and the mullions below. Next door is another new front of red brick, in a rather purer form of Classic, the windows in this instance being marked by moulded projecting architraves and cornices, and the façade by a dentil cornice of cut brick and a balustrade.

In the three buildings we have named, the same Semi-Classic style has been carried out, though in different manners. Very decided Classic details may be seen in all three instances, but these have been turned to very different accounts; in one case verging upon Late Gothic by the adoption of mullioned windows, and upon Italian in another.

In studying the architecture of street façades it is easy to see a struggle is going on between the wall and the window element. When Italian became the prevailing style, the window was the prominent feature; the wall was reduced to a dead flat plane, and had a sort of negative existence, upon which the windows appear as framed openings. Such buildings have generally two or more tiers of windows, each supported by columns or pilasters carrying either a pediment or an entablature; the wall is quite plain, sometimes rusticated between the ground-story windows, and a horizontal string-course cuts off the rusticated from the ashlar-work above. In contradistinction to this kind of elevation was the columnar façade which preceded it, in which the windows were mere apertures in the wall, while upon the wall a screen of columns or pilasters was planted, as it were—a style which prevailed during the age of Sir W. Chambers and his school, and of which parts of Somerset House may be taken as admirable examples. There was more monumental grandeur and impressiveness in the use of columns and porticoes, but the style fell into disuse for common purposes as soon as the age began to look upon every-day architecture in a more common-sense manner, and as soon as it became apparent that it was a mere mockery to have large columns composed of brick, cemented over to make them look like stone. The fenestral style was decidedly an improvement, but it led to a monotonous kind of façade in which the wall was a mere blank surface. Latterly the wall has again come into prominence; the columnar style has, however, for ordinary façades, given place to a treatment in which the piers are pronounced and made to assume projecting vertical faces or pilasters between the windows, and many conspicuous developments of this mode of dealing with our fronts may be noticed. Three distinct expressions of the style may be noticed in some new buildings in Throgmorton-avenue, London-wall. Here we have the columnar style typified in the new Carpenters' Hall, the new offices of the Submarine Telegraph Company on the opposite side in a florid Italian Renaissance, in which the windows are the chief ornamental features, and near to the last, in a plainer but similar style, the façade of the new Provincial Bank of Ireland, another recent building. "Drapers-gardens," lower down, shows a flat, pilaster treatment, in which the fenestration is set back, but made a prominent feature. It is easy to see which is the mode likely to become employed in our towns. The columnar has been given up for general commercial purposes as an unbending pompous expression; the fenestral style of the Italian or Florentine school is also rather inflexible, though very well suited to Pall Mall, where it is planted, or to private residences like Bridgwater House; but the architecture of our streets, to adequately express a variety of wants, must be capable of making use of a vernacular material in a pliant yet architectural manner.

EXHIBITION OF SWISS ART.

THE artists of Geneva have opened an exhibition at 168, New Bond-street, which is the first of the kind held in London. The collection is representative of the works of living and deceased artists, and as such will repay a visit from all connoisseurs. From the catalogue of the pictures, illustrated by pen-and-ink sketches made by the artists' themselves, and annotated by Mr. Lawrence Harvey, architect and medallist of the Ecole des Beaux Arts, Paris, to which is added an historical sketch of art in Geneva, by Robert Harvey, Ph.D., a brief biographical account is furnished of the leading artists who have developed the art of Geneva, especially the school of Swiss landscape painting. The present exhibitors are, in fact, the artistic descendants of De La Rive, who died in 1817, and was the first Genevese painter of Swiss scenery. It would be impossible in a rapid glance at the pictures to do more than point to some characteristic paintings, chiefly confined to the land of Alp, and lake, and valley. In the lower gallery are to be seen a few striking pictures of the Alps, as No. 13, by Ed. Metton, "Le Dome," in the chain of Mont Blanc, is a grand piece of Alpine scenery, though the high lights may strike the eye accustomed to the colourless and hazy atmospheres on this side of the Alps as being very harsh. The most striking of the large pictures is Arthur Calame's "Wreck at Sea," a view from Boulogne pier, remarkable for its fine colour, and the crowd of animated figures on the pier-head, painted in a vigorous manner. A portrait (No. 16) by Ch. Vuillermet, is a wonderful piece of execution and worthy of a high place in portraiture; there is a Rembrandt-like force in the face combined with the finish of a Wilkie. No. 17, by A. Lugardon, is a fine view of the "Eiger Group of Mountains, from the Great Bernese Oberland," giant mountains from 10,000ft. to 13,000ft. above the level of the sea; the painting, however, suffers from a crude sharpness in the lights and colouring a little too "stagey" for an easel picture. A grand ravine such as can only be seen in Alpine passes, is painted by Jules Hébert, whose works evince force and decision of handling. It is the Via Mala (22). A. Veillon's "Morning View of Monte Rosa," an isolated peak with its winding glacier, is clearly painted; and a very forcible picture is A. Beaumont's "Sunrise on the Wetterhorn" (32), with its dark foreground of mountain; "Drying Nets on the Savoy Shore of Lake of Geneva," by F. Bocion, is painted with a good deal of French feeling. The grey tones of Miller or Daubigny are depicted in shore of the lake, and the handling is quite different from the simple unaffected treatment of English landscape. No. 40, a view of the Jungfrau, by A. Lugardon, is a clever study of light and shadow, and we must also name F. Furet's "Lake of Geneva" (47), and "View of the Eiger" by A. Veillon (49), as effective studies of sunshine and brilliant colour in which breadth and poetic sentiment are combined. "The Village Engine going to a Fire" (52), is the subject of a large picture by Eugène Burnand, powerfully painted in the dashing spirited group of men and horses; and we must cursorily note N. Lemaitre's "Mont Blanc," a fine study of gradation of colour from a dark rocky foreground to the purple and roseate tints of the distant mountain-crest; and the clear blue mountain scenery of Lake Leman (60); nor can the visitor fail to notice, before quitting this gallery, a few pictures of incident, one by Henri Hébert (19), a spirited study of a christening, thoroughly French in manner; also Nos. 30,

and 37; "Crossing the Frontier" by E. Castres (53), "A Soldier's Yarn" (61), by B. Vautier, a picture of almost Teniers-like fidelity in detail; and a case of enamel paintings showing some spirited figure subjects.

The upper galleries contain a few striking landscapes, lakes, and mountain-pieces by J. Hébert and A. Veillon. The last-named artist's Lake of Engstlen (73), is a vivid study of transparent lake scenery with the rising Titlis in the background. The artist has depicted the lake famed for its transparency and blueness with realistic truthfulness. No. 69, "The Matterhorn at Daybreak" is a fine view of the magnificent valley of Zermatt, with the over-towering heights of the mountain tipped with bright orange. L. Mennet's view of Mont Blanc (77), and another by the same artist (82), are very graphic paintings of lake and picturesque scenery, but the most noticeable picture in the room is by E. Castres, "Changing Horses at the Hospice du Simplon" (78), a village just below the summit of the mountain, showing a diligence arriving at the hotel, the snow-clad landscape being relieved by the figures of tourists and the hospitable refuge of the Augustine monks. The scene is truthfully told and impressive in simple contrast of the dark dress on the white landscape. "The Troubadour" by E. Robellaz, is clever in composition, and animated in the figures. E. Sordet's "Wetterhorn" is a wildly grand picture of barren crags and fruitful valley; and there is decidedly French handling in the colour and treatment of "A Village Farm" (No. 87). We must also glance at a work by E. Metton of rock and pine; another by Albert Gos (90), a fine view from the upper end of the lake of Geneva, the mountain background of Le Gramont rising from the dreamy lake, the whole a wonderful piece of atmospheric painting. If the collection fails in the more refined touch and execution of the French and English schools of landscape, it shows, nevertheless, a vigour and freshness that is a hopeful sign of a growing art. The visitor may see Alpine scenery depicted only as native artists can depict it; the snowy Alp, the glacier, lake, and plain are rendered with all the reality of nature, and with a boldness of handling characteristic of an untrammelled race of artists.

The water-colours are not less remarkable for these qualities. S. Clift's "Castle of Chillon," Mr. H. Terry's "Temple of Augustus at Pola," a tetrastyle portico, and the same artist's view of court in the "Bey's Palace at Constantine" (105), are distinguished for truthful drawing and colour. Two frames of sketches by F. Furet of Genevese views (117) are bright and sparkling studies, partly obtained in body colour, evincing a keen sense of natural freshness and sunlit effects, mellow and soft in tone. The fresh green and the breadth in "Spring" and "A Field of Flowers," are particularly striking, and the artist has not lost in the general effect the finish of smaller details. We cannot omit to notice the great glacier d'Aletch by J. Way (114); nor the beautifully sharp and brightly-coloured sketches by H. Silvestre (Nos. 119, and 115), both true in architectural drawing and colour; nor the series of admirable water-colour sketches executed by the late H. Terry, placed round the room and now for sale by his widow. These are studies of Swiss, Italian and English landscape. A few spirited charcoal drawings are also in the collection.

ENGINEERING IN SOUTH AFRICA.—II.

IN the last article we gave a short and sketchy history of the system of railway-making at the Cape. We now purpose to give young members of the profession, who intend going abroad—as many of them do—the benefit of our experience, obtained by many years of professional toil, both at home and abroad.

We will suppose a young engineer has been appointed as assistant in one of the colonies on a salary of £300 per annum, with 7s. 6d. per diem as a "field allowance" whilst in camp. The Government of the Cape usually find food for a horse which they supply. And if there are three or four young fellows living together in camp—as is usually the case—on survey, they can live well on their "field allowance," and save their salaries. Before leaving England, the following instruments should be purchased, and the very best makers chosen:—A 5in. transit theodolite, a 12in. level and staff, a large aneroid to read up to 10,000ft., a prismatic compass, a box sextant, a steel (Gunter's) chain, a few well-selected books of reference, a small but good box of drawing instruments, also railway curves and scales. This is all we consider absolutely necessary, and as transport is often difficult to obtain, more becomes a nuisance. There is little shooting in South Africa, consequently a gun is not much use. The ordinary clothing of England is suitable for the Cape; many people make the great mistake of bringing with them far too much. However, an indiarubber bath and waterproof sheet should not be omitted; but a silk hat and a supply of gloves are advanced luxuries. When all these things named are provided, if our assistant has still money to spare, he should purchase the apparatus and books necessary to enable him to pursue his favourite non-professional subject, such as astronomy, or botany, for unless a man has some sound resources within himself, he will often find time hang intolerably heavily on his hands, especially in up-country places. And the *ennui* thus produced is too often disposed of by Cape brandy; but we must say that out of eighty or ninety engineers we met with in South Africa, very few fell victims to drink, whereas, with the medical profession the reverse is the rule, and we can account for it in no other way but that the former had plenty to occupy their time and were always within a short distance of a colleague, whereas the medical man, living in a small and obscure village, having, as a rule, no kindred spirit for an associate, becomes disheartened, and then, if there is no mental resource, his downfall follows.

Up to the present we have spoken of Government appointments, which are in many respects desirable, and as, in the course of a few years—perhaps less—men will be required for various proposed works, we would recommend any engineer, who is desirous of service abroad, to try to obtain an appointment at the Cape, the Transvaal (where, before long, they must have railways on an extensive scale), Natal, or the Orange Free State—the climate of all is good, excepting a small portion of the Transvaal near the coast, which is low-lying and swampy.

The Government do not, however, monopolise the professional field; there is room in abundance for private practice, which is growing every day, and is now in the hands of the unlicensed adventurers we spoke of before. Except in the Government service there are few—very few—qualified architects; in fact, we know of none. But there are several who, year after year, expend thousands on buildings the most hideous that ignorance and vulgarity can conceive. This is one great field for private practice. Let any architect who comes abroad, learn, before he leaves home, how to take and book continuous levels and use a theodolite, as he may be required to build reservoirs, dams, weirs, or filters, in connection with mills and wool-washes, &c., where the use of an instrument is indispensable, and where the services of an engineer cannot be obtained. In most colonial works, an architect will be expected to give good practical results rather than æsthetical effect.

As to an engineer arriving out with the intention of entering into private practice, if he follows the advice which we give, he may do well; but we must first point out a difficulty he will meet with in the laws of the country, and then show him a way out of his troubles. Of course, as at home, any man, be he a tinker, a tailor, or anything else you please, can advertise himself as an architect or engineer, or both; he can build all sorts of structures, and make railways or canals, and he meets with no legal difficulty. But he must not survey; for, the moment he enters the field of the land-surveyor, he is face to face with a hard and fast law, that completely ignores him and his work, unless he has passed an examination for, and obtained the licence of, a "Government surveyor." And as this examination is open to all, on payment of a small fee (£15), and as any young engineer with ordinary qualifications could easily pass it with a little rubbing up, he should make it the initiative step to his professional career at the Cape. At the present moment there are about sixty Government surveyors in practice, the total list embracing only one hundred and two, and the area of the British possession in South Africa is somewhere about seven hundred thousand square miles, which is ridiculously out of proportion to the number of surveyors; the result being, they obtain more to do as a rule than they can execute, and their work is vastly different from what an engineer would expect to see. They no doubt can give the correct acreage of a piece of country, but as their qualifications do not include drawing of any kind, their maps (or diagrams as they call them) are of the most meagre and school-boyish character. For these and other reasons, we have no hesitation in saying that an engineer, having passed the examination, and being expert (from previous experience) in getting up plans, &c., would soon monopolise the most paying portion of the surveyor's practice, such as townships, locations, &c. The examination we do not consider a difficult one, consisting as it does of pure mathematics in the first instance; and when this is passed, some actual work must be executed to the satisfaction of the "Surveyor-General" of the colony. We must not be understood to say that an engineer should give up his profession altogether for surveying—far from it; but he should most certainly combine them. And a much more satisfactory combination would be found than that of architecture and engineering, if we are allowed to judge from the eye-sickening buildings erected by the latter profession all over the world. An engineer has no time to devote to architecture, whereas surveying is a vital part of his early education; therefore, the combination with the latter is natural and wise, but with the other, for the most part highly unsatisfactory to all. R. H. H. H.

CENTRE OF GRAVITY.

IT has been demonstrated, both experimentally and by mathematical deduction, that in every solid body there is some point at which, when it is acted upon only by the attraction of gravity, the body can be supported by a upward force, all its particles being in equilibrium about that point so that no other force is required to keep it in its place. Thus, for example, if a long plank of uniform width and thickness is rested at one end only on the edge of another plank, the force of gravity will cause the opposite end to fall to the ground; but if the plank rests at its middle, then both ends will be kept off the ground, and the whole plank can be supported at the middle

point only. Should it happen, however, that the plank is thicker or wider at one end than at the other, it will no longer be found to balance about its middle point, but about some other point which is nearer the heavier end. The point about which the body balances in either case is called its "centre of gravity," and is that through which passes the resultant of all the forces which the earth's attraction exerts upon the particles of the body. The weights of all the particles may be considered as a number of parallel forces, whose respective moments, taken about the centre of gravity, balance each other. In a homogeneous body, or one in which the particles have all the same size, weight, and distance apart, the centre of gravity coincides with the middle point of the body or mass; and although this condition is seldom if ever found to exist in any known substances, yet we shall, for the sake of simplicity, consider in what follows that all bodies are homogeneous, so that instead of the mass of any body, or the number of particles it contains, we may substitute, in our investigations, its length, area, or solidity, as the case may be; since these are, upon that supposition, proportional to the mass or weight of the substance.

The term "centre of gravity" has been applied for the sake of convenience to the point described above, but its position is quite unaffected by any variation in the actual force of the earth's gravity or attraction, or by any change in the position of the body with respect to the earth; thus the centre of gravity of a plank remains in the same place whether the plank is in a horizontal, vertical, or oblique position; and this property affords us a rough and ready method of finding experimentally the position of the centre of gravity in flat surfaces such as triangles or polygons; for if we suspend the triangle A, B, C (Fig. 1), loosely

FIG. 1.

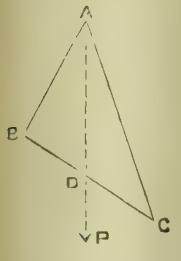
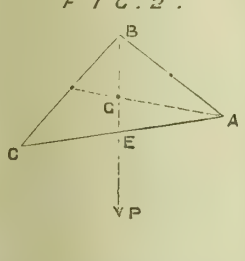


FIG. 2.



from an angular point A, and drop a plumb-line, A P, from the same point, marking the line, A D, where it passes over the figure, and then do the same thing with the angular point, B, marking the line B E (Fig. 2), we shall find that the point G, where A D and B E intersect, is the centre of gravity required.

The importance of knowing the position of the centre of gravity of any body will be seen when we consider that in any investigation of the force which the body exerts, we may suppose its whole mass or weight to be concentrated at that point, and to produce the same mechanical effect as the weight of the body itself actually produces, so that in all problems in mechanics we have only to consider the weight of a body as acting at the centre of gravity. Thus, in calculating the resistance of a wall of solid masonry to any force tending to overturn it, we take its weight acting vertically at the centre of gravity of its section multiplied by its perpendicular distance from the outer edge of the wall as the moment of resistance which has to balance that of the applied force taken about the same point. Suppose A B (Fig. 3) to represent the section of a wall, column, or pier, resting on level ground; it will not fall over by its own weight so long as a vertical line from its centre of gravity, as g, passes within the outer edge, A; but if the structure is raised or loaded at the top with a heavy weight, so as to raise its centre of gravity to G, the vertical line from

FIG. 3.

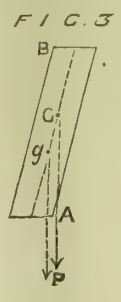
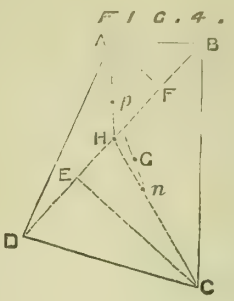


FIG. 4.



which passes ever so little outside the base at A, the body will then fall over about that point by the action of gravity. In the former case, the weight has a moment about A tending to draw the mass inwards, while in the latter the moment of the weight tends to pull the wall outwards.

We shall now proceed to show how the position of this important point can be determined with more or less accuracy in the various figures commonly used in construction. In simple geometrical forms the centre of gravity can be readily found by ordinary geometry; thus, in a uniform straight rod or cylinder, its position is evidently at the middle point; and if two heavy particles of equal weight are connected by a thin rod, their common centre of gravity will be half-way between them; but where their weights are unequal, that point will be nearer the heavier particle, its distance from each being inversely proportional to their weights. In a parallelogram the centre of gravity is the point of intersection of the diagonals. In any plane triangle its position is found by bisecting any side A C in E (Fig. 2), drawing the line B E and taking E G equal to one-third of B E, then G is the centre of gravity of the figure.

The position of the centre of gravity of a triangle being determined, we can readily ascertain that of any other plane polygonal figure by dividing it into triangles. For example, in the trapezium A B C D (Fig. 4), representing the section of a retaining wall, its centre of gravity, G, is required to be found; draw BD and bisect it in H, draw AH and CH, and take Hp one-third of HA, Hn one-third of HC, p and n will be the centres of gravity of the two triangles. Join $p\,n$, and draw AF and CE perpendicular to BD; then these lines can be put to represent the areas or masses of the triangles respectively, which may be considered as concentrated at p and n, and the centre of gravity, G, will be in the line $p\,n$, so that

$$\begin{aligned} \text{AF} \times \text{G}p &= \text{CE} \times \text{G}n \\ &= \text{CE} \times (p\,n - \text{G}p) \\ \therefore\ \text{G}p\,(\text{AF} + \text{CE}) &= \text{CE} \times p\,n \\ \text{or, } \text{G}p &= \frac{\text{CE}}{\text{AF} + \text{CE}} \cdot p\,n \end{aligned}$$

In order to investigate the strength of an iron beam, it is requisite that the centre of gravity of its section should be determined, as the neutral axis passes through that point, provided that the strain to which it may be subjected does not surpass the limit of elasticity. The simplest form of section is that of "angle" iron (Fig. 5) Let p and n be the centres of gravity respectively of the two arms, join $p\,n$, and let a be the area of section A B, b that of A C; then the centre of gravity G is in the line $p\,n$, and is determined by the equation—

$$\begin{aligned} a \times \text{G}p &= b \times \text{G}n \\ &= b\,(p\,n - \text{G}p) \\ \text{or G}p &= \frac{b}{a+b} \cdot p\,n \end{aligned}$$

In the case of the "tee" section (Fig. 6),

FIG. 5.

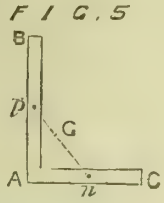
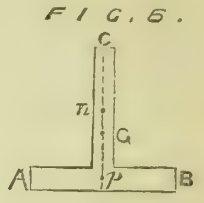


FIG. 6.



let Cp be the central axis, p and n the centres of gravity of the flange and web respectively, a the area of the flange A B, b that of the web or vertical portion; then, as before, we find b from the equation—

$$\begin{aligned} a \times \text{G}p &= b \times \text{G}n \\ &= b\,(p\,n - \text{G}p) \\ \text{or, } \text{G}p &= \frac{b}{a+b} \cdot p\,n, \text{ and } \text{G}n = p\,n - \text{G}p. \end{aligned}$$

As an example of T-iron, let us take the length of A B as 6in., and its thickness 1in., that of the vertical part 5in., and thickness $\frac{3}{4}$in., then $a = 6$, $b = \frac{15}{4}$, and p being the middle point of the section of A B will be $2\frac{1}{2} + \frac{1}{2}$ or 3in. from n;

$$\text{G}p = \frac{\frac{15}{4}}{6 + \frac{15}{4}} \times 3 = \frac{15}{13}\text{in.}$$

$$\text{G}n = 3 - \frac{15}{13} = \frac{24}{13}\text{, or 1·846in.}$$

Another common form of section of an iron beam is shown by Fig. 7, which may be

FIG. 7.

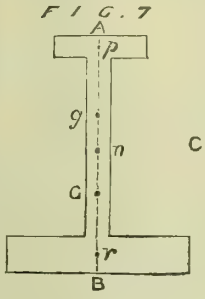
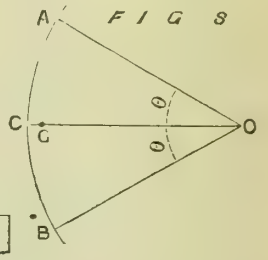


FIG. 8.



divided into three rectangles, of which p, n, and r are the centres of gravity respectively, situated in the central axis AB. First find the common centre of gravity g of the web and top flange, taking a for the area of the flange, b for that of the web; then we have

$$\begin{aligned} b \times g\,n &= a \times p\,g \\ &= a\,(p\,n - g\,n) \\ \therefore g\,n &= \frac{a}{a+b} \cdot p\,n \\ g\,r &= g\,n + n\,r. \end{aligned}$$

Let c be the area of lower flange, then, since the mass of the web and upper-flange are concentrated at g, we have

$$\begin{aligned} c \times \text{G}r &= (a+b)\,\text{G}g \\ &= (a+b)\,g\,r - \text{G}r) \\ \text{or G}r &= \frac{a+b}{a+b+c} \cdot g\,r \\ \text{and G}n &= n\,r - \text{G}r. \end{aligned}$$

Suppose, for example, that we have beam whose top flange is 5in. × 1in., the web 10in., × 1in., and the bottom flange 10in. × 2in.; then $a = 5$, $b = 10$, $c = 20$, $p\,n = \frac{11}{2}$

$$\therefore g\,n = \frac{5}{5+10} \times \frac{11}{2} = \frac{11}{6}\text{, } n\,r = 6,$$

$$g\,r = g\,n + n\,r = \frac{47}{6}\text{ ins.}$$

$$\text{G}r = \frac{5+10}{5+10+20} \times \frac{47}{6} = \frac{47}{14}\text{ ins.}$$

$$\begin{aligned} \text{G}n &= 6 - \frac{47}{14} \\ &= \frac{37}{14} = 2{\cdot}643\text{in.} \end{aligned}$$

In order to determine with exactness the position of the centre of gravity of curved lines, or of surfaces bounded by curves, or

of solids whose section is some known curve, it is necessary to employ the rules of the integral calculus. Thus, in the case of an arc, ACB (Fig. 8) of a circle whose centre is O, and C its middle point, the centre of gravity G of the arc will be on the line OC, which bisects the angle AOB; and if θ be the half-angle, AOC, then the formula for finding the distance of G from the centre of curvature is

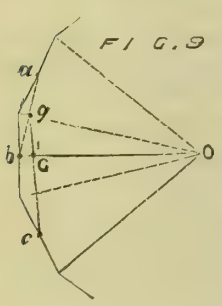
$$OG = OC. \frac{\sin. \theta}{\theta}$$

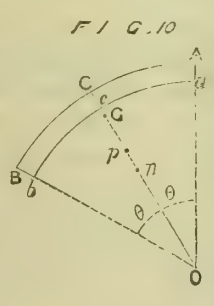
the angle θ in the denominator being measured in "circular" units and not in degrees. The position of the centre of gravity of a circular arc is required to be known in the investigation of the strength and thrust of arched ribs in which the depth of the rib is small as compared with the radius, so that the centre of gravity of the line passing through the middle of the section of the rib may be taken without material error for that of the rib itself. To facilitate such calculations we give below a table showing the values of θ and $\frac{\sin. \theta}{\theta}$ for different lengths of arc.

Value of θ in deg.	Value of θ in circular units.	$\frac{\text{Sin. } \theta}{\theta}$
5	.0873	·9987
10	·1745	·9949
15	·2618	·9886
20	·3491	·9798
25	·4363	·9686
30	·5236	·9549
35	·6108	·9389
40	·6982	·9207
45	·7854	·9003
52½	·9162	·8658
60	1·0472	·8270
67½	1·1781	·7842
75	1·3090	·7379
82½	1·4399	·6886
90	1·5708	·6366

To find G by this table we have only to multiply the radius of the arc by the number in the third column, which corresponds with the half-angle AOC, subtended by the half-arc at O, and we get the distance of G from O. For example, let A B subtend 60° at O, then θ = 30°; and if O C = 20ft., then O G = 20 × ·9549 = 19·098ft., so that the point G is very nearly 1ft. from the middle point C.

We can, however, find approximately the centre of gravity of an arc by considering it as made up of a number of small straight lines, or by taking the chords to represent the arcs. Let a, b, c (Fig. 9) be the centres





of the chords of a number of small arcs; draw $a\,b$, and bisect it in g; then g is the centre of gravity of the two chords, and very nearly of the two arcs which they cut off. Then draw $g\,c$, and take G g to G c in the ratio of the length of the chord c, to the sum of the lengths of a and b; G will be the centre of gravity of the three chords, and very nearly of the arc of the curve. If the chords are equal, and the curve a circle, then G will be on the radius O b, and Gg is equal to one-third of $g\,c$. In the same way we can proceed for any number of chords.

For the purpose of investigating the stability of circular stone arches it is necessary to find the centre of gravity G of a portion of the arch such as A C B (Fig. 10). In order to do this we must determine the position of the centres of gravity respectively of the two sectors, A O B and a O b, namely, p and n, which are situate in the radius, O C, bisecting the arc, A C B. If R and r are the radii of the outer and inner curves, and O the centre of curvature, 2θ the angle, A O B; then we find by help of the integral calculus that

$$Op = \frac{2}{3} R \frac{\sin. \theta}{\theta}$$

$$On = \frac{2}{3} r \frac{\sin. \theta}{\theta}$$

and $$pn = Op - On$$

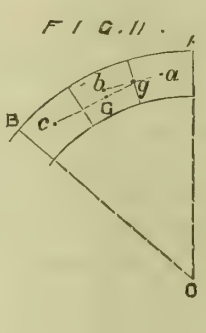
Now, since the masses or areas of the sectors vary as the squares of their radii, we have

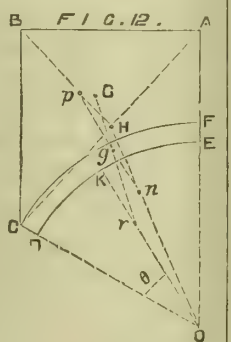
$$Gp . R^2 = Gn . r^2$$
$$= r^2 (pn + Gp)$$
$$\therefore\ Gp = \frac{r^2}{R^2 - r^2} . pn$$
$$\text{and } OG = Op + Gp$$

For example, suppose the arch to subtend an angle of 60° at O, then θ = 30°; let the arch be 9in. thick, and the inner radius 10ft.; then r = 10, R = 10¾, and by the foregoing table we have $\frac{\sin. \theta}{\theta}$ = ·9549, so that

$$Op = \frac{2}{3} \times \frac{43}{4} \times ·9549$$
$$= 6·8435\text{ft.}$$
$$On = \frac{2}{3} \times 10 \times ·9549$$
$$= 6·366\text{ft.}$$
$$pn = 6·8435 - 6·366 = ·4775$$
$$Gp = \frac{10^2}{\frac{43^2}{16} - 10^2} \times ·4775$$
$$= 3·0683\text{ft.}$$

O G = 6·8435 + 3·0683 = 9·9118ft., or 9ft. 10 9-10in., which places G 1·06in. below the intrados of the arch. The centre of gravity of an arch can also be found approximately by considering the section of each voussoir as a trapezium of which a, b, c (Fig. 11) are the





centres of gravity. Join $a\,b$, and if the voussoirs are equal the point g bisecting $a\,b$ will be their common centre of gravity; or if unequal, then $a\,g : b\,g$ in the ratio of the area of voussoir b to that of voussoir a. Join $c\,g$, and in the case of equal voussoirs the common centre of gravity G will be found by taking Gg one third of $g\,c$; or if unequal, then G c : Gg as the sum of the areas of a and b to the area of voussoir c; and so on for any number of voussoirs.

In the case of a surcharged arch, A B C D E, (Fig. 12), in order to determine G, the centre of gravity of the section of the solid portion, we have first to find those of the trapezium A B C O, and of the sector E O D. Divide the trapezium into two triangles by the diagonal A C bisected in H, and draw B H and O H; take Hp one-third of H B, H n one-third of O H; join $p\,n$, and in the line $p\,n$ take $n\,g$ to $p\,g$ in the proportion of the area of triangle A B C to that of triangle A O C; g is the centre of gravity of the trapezium. Let the radius O r K bisect the angle D O E, then, as before, we get the centre of gravity r of the sector from the formula

$$Or = \frac{2}{3} OD \frac{\sin. \theta}{\theta}$$

θ being half the angle D O E.

Let a be the area of sector, b that of the trapezium, then $a = O D^2 . \theta$, θ being taken in circular measure from the second column of the foregoing table—

$$b = \frac{OA + BC}{2} \times AB$$

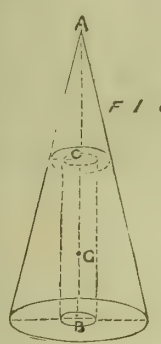
and the area of A B C D E is $b - a$

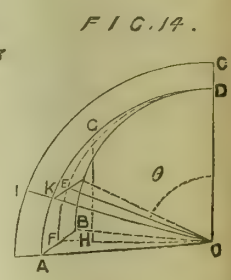
Draw the line $r\,g$, and produce it to G, so that—

$$a . gr = (b - a)\, Gg$$
$$\text{or } Gg = \frac{a}{b - a} \times gr$$

which determines the position of the point G.

The position of the centre of gravity in solid bodies such as the parallelopiped, cylinder, cone, &c., cannot be determined by an experimental method, as in the case of planes, and we must, therefore, rely entirely upon geometrical investigations for obtaining it. In the case of a cylinder whose top and bottom are circles or regular polygons, the centre of gravity is in the central axis and half way between the top and base. In a solid right cone or pyramid having any number of equal sides, the centre of gravity is in the vertical line A B (Fig. 13) drawn from the vertex to the





centre of the base and at one-fourth of the height above the base. In a hollow cone or pyramid where the surface is a very thin shell, the centre of gravity is at one-third of the height from the base.

To find the centre of gravity of the frustum of a cone cut off by a plane at C parallel to the base, let B C = h, a the radius of the base, b the radius of the top at C; then we obtain G, the centre of gravity of the frustum from the formula

$$BG = \frac{h}{4} . \frac{a^2 + 2ab + 3b^2}{a^2 + ab + b^2}$$

In the case of a pyramid the same formula will apply, by taking a and b, as corresponding sides of the base and top, or as radii of the inscribed or circumscribed circles respectively.

Suppose it is required to find the centre of gravity of a solid round column, 30ft. high, with a radius of 2ft. at base, and of 20in., or 1⅔ft., at the top. In this case we have—

$$h = 30,\ a = 2,\ b = \frac{5}{3}$$

$$BG = \frac{30}{4} . \frac{4 + \frac{20}{3} + \frac{25}{3}}{4 + \frac{10}{3} + \frac{25}{9}} = \frac{2565}{182}$$
$$= 14·0934, \text{ or } 14\text{ft. } 1\tfrac{1}{8}\text{in.}$$

Now let a circular cylinder or flue of radius r be cut out of the middle of the column, and having its axis coinciding with that of the column, as shown by the dotted lines (Fig. 13), as in the case of a chimney shaft; it is required to find the position of the centre of gravity g of the solid part that remains, which will of course lie in the

common vertical axis. Let n be the centre of gravity of the cylinder, then $Bn = \frac{h}{2}$. Let M and m represent the masses of the solid column and of the cylinder, M − m will be the mass of the remaining solid portion. Then we have, by geometry—

$$M = \frac{\pi \cdot h}{3}(a^2 + a \cdot b + b^2)$$

$$m = \frac{\pi \cdot h}{3} \cdot 3r^2$$

$$M - m = \frac{\pi \cdot h}{3}(a^2 + a \cdot b + b^2 - 3r^2)$$

$$\text{Then } B\,g = \frac{M \cdot BG - m \cdot \frac{h}{2}}{M - m}$$

In the foregoing example let r = 9ins = ¾ft., then we have,—

$$M = \frac{\pi \cdot 30}{3}\left(4 + \frac{10}{3} + \frac{25}{9}\right)$$

$$= 10\pi\frac{91}{9}$$

$$m = 10\pi\frac{27}{16},\quad M - m = 10\pi\frac{1213}{144}$$

$$\therefore B\,g = \frac{\frac{91}{9} \cdot \frac{2565}{182} - \frac{27}{16} \cdot 15}{\frac{1213}{144}}$$

$$= \frac{16875}{1213} = 13{\cdot}9118\text{ft.}$$

$$= 13\text{ft. } 10{\cdot}94\text{in.}$$

In the case where the column has an entasis, the position of the centre of gravity will be rather higher than where the sides are perfectly straight; but the difference is so very trifling that it will be quite near enough to take the centre of gravity as found above, since the determination of its exact position when the outline is a curve involves very intricate formulæ.

In the investigation of the stability of domes of stone or brick, it is required to determine the position of the centre of gravity G (Fig. 14) of a thin slice or "lune" which is cut out of the dome, as C D K I. Let H G be the vertical line dropped from G on the horizontal line O F, where O is the centre of the dome, supposed to be spherical; then it is sufficient for the purposes of the investigation to find the value of O H. When the angle A O B is small, we obtain by help of the integral calculus the formula—

$$OH = \tfrac{3}{8} \cdot \frac{R^4 - r^4}{R^3 - r^3} \cdot \frac{\theta - \frac{1}{2}\sin.2\theta}{1 - \cos\theta}$$

Where O I = R, and O K = r, and θ is taken in circular measure as in the second column of the above table. If, for example, we make the angle θ equal to 70° or 1·2216 from the second column of the table, then

$$OH = \tfrac{3}{8} \cdot \frac{R^4 - r^4}{R^3 - r^3} \cdot \frac{1{\cdot}2216 - {\cdot}3214}{{\cdot}65798}$$

$$= {\cdot}513\,\frac{R^4 - r^4}{R^3 - r^3}$$

When θ is a right angle, we have

$$OH = \tfrac{3}{8} \cdot \frac{R^4 - r^4}{R^3 - r^3} \times 1{\cdot}5708$$

$$= {\cdot}589\,\frac{R^4 - r^4}{R^3 - r^3}$$

If we take r = 10 and R = $10\frac{3}{4}$, we find

$$\frac{R^4 - r^4}{R^3 - r^3} = \frac{214700}{15507} = 13{\cdot}845$$

In which case OH = 7·1 for θ = 70°, and OH = 8·155, when θ is a right angle.

The height HG of the centre of gravity is determined by the formula

$$HG = \tfrac{3}{8}\,\frac{R^4 - r^4}{R^3 - r^3}(1 + \cos.\theta)$$

which becomes, when θ = 70°,

$$HG = {\cdot}503\,\frac{R^4 - r^4}{R^3 - r^3}$$

and when θ = 90°,

$$HG = \tfrac{3}{8}\,\frac{R^4 - r^4}{R^3 - r^3}$$

With the above values of R and r, we have HG = 6·964 for θ = 70°, and HG = 5·192 for θ = 90°.

It is very desirable that the architect in designing a structure should take into consideration the position of its centre of gravity, since its stability is much affected by the position of that point. The most stable and durable buildings are undoubtedly those of a conical or pyramidal form, in which, as we have seen above, the position of the centre of gravity is very low down; and next to these we may put such buildings as taper upwards from the base like many of the towers of old English churches where the base is made broad and strengthened with projecting buttresses, the upper part being much narrower than the base and often terminated by a conical spire. On the other hand, we sometimes meet with buildings which are made wider as they get higher, and having overhanging angle turrets or oriels corbelled out, or with heavy projecting cornices, all of which tend to raise the centre of gravity and reduce the stability of the structure. Lofty chimney-stacks are often made with the upper part nearly twice the width of the lower part next the roof, so as to resemble in form an inverted cone in which the centre of gravity is the highest possible, so that it is not to be wondered at that such structures are often blown down by the force of the wind in heavy gales.

ROYAL ACADEMY LECTURES ON ARCHITECTURE.*

THE DEVELOPMENT OF STYLES.

TO-NIGHT I propose to speak to you on the development of styles in architecture. It is a subject which everyone is bound to study who wishes to know anything at all about the meaning and history, not only of the various orders or styles of architecture, but, one may almost say, of every detail of their ornament. In art, it is true, there are periods of progression and retrogression. We see a style gradually and patiently developed to perfection, and then, after a more or less prolonged reign, we see it deteriorate, either in the hand of the very nation by which it had been perfected, or, more commonly, by the influence of another nation, who, by right of conquest, have been the masters, and have destroyed or modified the style which they found existing.

The modes in which styles are developed one out of the other are numerous. There is, first, the gradual progress towards perfection. There is the change caused by transplanting a style invented in one country to another, whose religious, political, and, more than all, whose climatic conditions are different. There is, again, the influence of new processes or new modes of construction, of new materials, or the absence of the materials by the use of which advance has hitherto been secured. There is the potent influence of religion; the influence, again, of individuals, either of great sovereigns or of skilful architects; and—greatest of all—that of military conquests, and the intercourse of traders with foreign countries. All these and many minor causes have contributed to the changes which have from time to time occurred in the history of our art, and to understand them all thoroughly some acquaintance is required with the history of various countries, with the growth and consolidation of states, and the connection which has existed between them at various periods. But, even without this knowledge, it is possible to derive great gain from a merely general and summary study of the question, and it is in this that I wish to guide you to some extent to-night.

For our purpose it will be sufficient to go back so far only as the most perfect period of Greek art. With few and minor modifications, all existing European art may be traced back directly to Greece. The more ancient civilisations acted upon Greece, and, through Greece, upon Europe. Almost all Greek forms are derived from Assyria and Egypt; and, great as is the antiquity of Greek art, it is almost to be regarded as modern by the side of that of the East. We begin, therefore, with Grecian art after it had formed itself into a well-defined style, some six or seven centuries before the Christian era. At this date we find the Doric order in so well-defined and perfected a state in, *e.g.*, the Temple of Corinth, that for many centuries the variations from the type then established are only slight alterations from time to time in the proportions of the various parts, with a determined adherence to the general form and design as it was first seen. Some examples, as, for instance, the Lycian tomb in the British Museum, are, beyond all question, imitations of a wooden construction; but the question whether the design of the Doric order is or is not so also, has always been open to much discussion. The evidence of the entablature with the triglyphs above it is strongly in favour of a wooden origin; but, on the other hand, it is in the earliest examples that the columns are most clumsy and as unlike as possible to wooden posts. On the whole, however, this seems a not unlikely fault to have been committed in using a new material, whilst it is at least possible that the original wooden construction was confined to the roof resting upon stone or brick piers. And if the development of wooden construction into stone resulted in some of the grandest buildings for ages, showing the same adherence to the primitive type from first to last, it would be impossible to conceive a more singular survival of features, some of which had nothing whatever to do with the construction of the building. The Temple of Corinth, and probably the Temple at Assos in Asia Minor, date from the seventh century B.C. The Theatre at Girgenti was begun *circa* 480 B.C., the Temple of Theseus in 469, whilst the Parthenon was finished in 438. In a comparatively short period all the best examples of Doric were erected, but for 200 years before the Parthenon was built, if not for more, architects had been building in the same way; whilst for centuries later the style was still persevered in, until we see one of its latest examples in the Forum at Pompeii—probably a work executed under Greek influence—within a few years of the birth of our Lord.

At the same time, we have the interesting fact that other styles co-existed with the Doric during the greater part of the period referred to. The Ionic Erechtheium on the Acropolis was built in about 420 B.C., and is, therefore, as nearly as possible of the same date as the Parthenon. The Corinthian is a later order, and generally under Roman influence, but even this co-existed with Doric and Ionic. We have here, therefore, the remarkable fact that in Greece at the same time three styles of architecture were deliberately practised, and that the only alterations were modifications of proportion. There was absolutely no development of a new style, no combination of the features of the three styles, and the Doric never, as time went on, underwent any modification or improvement from contact with the Ionic, or the Ionic from the Doric. Indeed, it is probable that architects confined themselves each to one style even if the adoption of the style did not depend—as it did later, in the times of Guelph and Ghibelline in Italy, and of the Moors and Christians in Spain—upon the politics or the blood and the race of those who built.

The Greek mode of construction was so dependent upon the use of single blocks of stone that it was all but impossible to attempt the erection of buildings of vast size. A remarkable evidence of this is afforded by the Temple of Jupiter at Girgenti. Here the dimensions are vastly in excess of anything ordinarily built by them, the height being absolutely more than twice that of the Parthenon, and the architect ventured on the device of building up his columns with small stones and attaching them to the wall in a way which shows how limited the application of the style of architecture was, and with a result which must have been as unpleasing as it was, happily, unusual. But even such an example as this has its interest, showing as it does that among the Greeks there was no such thing as impatience and fretfulness because new things were not perpetually being invented. A beautiful thing once done could not be too often repeated. Men never tired of seeing it.

The handmaid of Architecture—Sculpture—in the same way, was just as deliberate, and when a really beautiful work had been done there was no hesitation as to repeating it over and over again. The Venus of Praxiteles is said to have been repeated at least a hundred times; and the same thing may be said of many of

* By George Edmund Street, R.A. No. 3, delivered Monday, Feb. 21, 1881.

the finest works of the greatest Greek sculptors.

The great virtue of the Greek artist was his appreciation of refinement of line, and his intense admiration for the noblest possible representations of man and beast. Compare Greek sculpture with Assyrian or Egyptian, and you see the gap which separates a perhaps dignified but always conventional figure from one in which the fire of the living soul is made to light up the well-wrought stone; and it was this temper which made him—possessor as he was of almost unmatched skill—content to labour on from one century to another in the reproduction of what he had once for all found to be very good.

From the Greek we turn naturally to the Roman, who was influenced by the magnificent remains of the Greek buildings in Southern Italy and in Sicily on the one hand, and by the even older work of the Etruscans on the other. He never realised the necessity of development in architecture, but the introduction of the arch, which he used freely in all his constructions, soon modified, and rapidly changed, the whole character of his art. He must be said, I fear, to have spoilt what he borrowed from the Greek, having little of his acute sense of beauty. He never observed that all Greek art was a reasonable adornment of a reasonable construction, and proceeded to treat the orders as mere ornaments to be added to the face of a wall, without any serious consideration of the purposes of the wall itself. He put the three orders one above another, three or four in height, pierced arches between them—having discovered the value of the arch without discovering how it ought to be used—and retained to each order and each stage of his building the heavy cornice, which had its *raison d'être* only in being the finish of a wall. In its larger works it is the brute force of the work, the vast thickness of the walls, the immense span of the arches and vaults, the trusting to size and solidity rather than to refinement or grace for the result to be achieved, that strike us, and not the beauty, imagination, or architectural fitness of the work. The architecture and the building were, to a great extent, wholly independent the one of the other. In some of the vastest Roman works—as, *e.g.*, the Basilica of Constantine and the Baths of Caracalla—the architecture has disappeared, and yet the walls remain. The architecture was *appliqué*, like a garment which had little to do with the body it covered, save to follow, in a general way, its outlines. The development (if it may be so called) which is seen in great orders piled one on another in the Flavian Amphitheatre, may well be compared with the Greek mode of treating a two-storied erection, as we see it in the *cella* of the Temple of Neptune at Pæstum, where the upper range of columns is simply a prolongation of those below, without entasis (for that would have been fatal to the continuity which was the essence of the design), and divided not by a cornice aping the top of a wall, but by blocks of stone forming a string-course and binding the whole together,—a construction strictly analogous to that of Gothic buildings, and wholly opposed to the Roman succession of orders.

I have said that the Roman used the arch without showing that he knew at all how it ought to be used. But it is in his capacity as artist, not as constructor, that I mean to make this statement. As a constructor he certainly had advanced far beyond the Greek, but his constructions are remarkable mainly for their vastness, and for the impression they convey of being the work of men who regarded the labour of hordes of untutored workmen with as much satisfaction as the work which could only be wrought by skilful hands. Or rather, I should perhaps say, they regarded the two things as entirely distinct,—built their walls, their arches, and their vaults first, and then brought their columns, their mouldings, and their statuary to adorn them. So that,—to take a good example,—the Villa of Hadrian, near Tivoli, is in its ruin a mass of rough brickwork with hardly one single evidence of art in its design, whilst the museums of Rome have been richly endowed with statues and sculptures which existed in it without being architecturally part of it. The arch was used as a servant to do good work, and no more, for the Roman never perceived that if it were to be a feature in the building it must, almost of necessity, be the chief feature. His one development was to construct his arch in a wall which was divided into panels by imitations, more or less exact, of columns, with their entablatures and cornices. His endeavour was evidently to make it seem still as if the column and the entablature had something to do with the construction, though, in point of fact, they were absolutely independent of it, and were decorations of the face of the wall, regulated in their position, and in no other way, by the size of the arch required. Then the column, with all its belongings, being found to be an ornament and no more, it was natural to see it at last placed away from the wall, connected with it by a returned plinth and cornice, and at last, carrying on its summit a statue or group which, by an after-thought, gave a kind of excuse—and a very lame one it is—for a piece of architectural feebleness which is almost unique. The development of the Roman upon what the Greek had given him was, therefore, nothing less than the destruction of the whole virtue of the original. That had been accurately constructed and well designed, whilst this was constructed with reference to design, and treated as no good architecture can possibly be,—as though the wall and its decoration were two wholly distinct and separable entities. For the first three centuries of the Christian era I see no evidence of anything that can properly be called an architectural development, or that even seemed to pave the way for one,—with one notable exception. This is the fondness of the Roman builders for circular arrangements either of rooms or of alcoves in angles of rooms, and of alcoves placed *dos-à-dos*. Of all these, good specimens are seen in the Palace of the Cæsars on the Palatine Hill, and in the double temple of Venus and Roma hard by, where the two temples are identical in plan, each finishing in an apse placed back to back. In the Pantheon, the enormously thick wall is planned with recesses, some coved and some square on plan, and with detached columns carrying the entablature above them,—an arrangement which we shall see somewhat later distinctly suggesting the design of the circular recesses under the dome of SS. Sergius and Bacchus at Constantinople, and San Vitale at Ravenna; whilst in the so-called Temple of Minerva Medica, a circular domed central space is surrounded by a series of ten recesses, nine of which are circular. The Greeks had shown their sense of the beauty of circular buildings, and the Romans followed in their steps, as we see in this example in the Pantheon at Rome, the little Temple at Tivoli, and in the Temple of Vesta at Rome. But the necessity for enormous supports to their skilfully-constructed domical roofs led the Roman architects to make these recesses in the walls where they could safely be introduced, and thus to pave the way for the introduction of buttresses, and of the apsidal terminations and circular chapels around them, which played so large a part in much latter developments.

It was in about A.D. 289 that the great step in advance was made in the building of Diocletian's Palace at Spalatro, on the eastern shore of the Adriatic. Here a range of arches was carried—probably for the first time—on the capitals of columns, without the interposition of any sort of entablature. The same sort of construction had, it is true, been suggested long before in such erections as the portico of the Pantheon, where semicircular arches are turned over the lintels above the columns in order to take the whole weight to the capitals, instead of on to the entablature. This apparently simple change was one which at once revolutionised all existing architectural laws. The column was no longer a mere ornament. It became at once the most useful, the most conspicuous, and in every way the most important, as it had always been the most beautiful, feature in a building. And from that time forward it was impossible ever again to construct a building as before with the post and lintel only, without deliberately ignoring the most useful and convenient discovery which has ever been made in the art of building. From that time the arch became master of the position, just as before the beam had been. The old system had lasted one can hardly say how many centuries, and it is needless to declare that nothing can ever make the use of the arch, round or pointed, absolete in the same real sense as the use of the lintel or beam has become.

The Greeks, who, if they did not invent, at least perfected the orders, never in later times seem to have sympathised at all with the Roman modifications of them, most of which were consequent on the use of the arch. Their Byzantine art owes but little to Rome. It was, in truth, a genuine invention of a style developed out of Greek, but in which the arch was an essential feature, and in which the cornices and mouldings, the columns and their capitals, were all modified to suit it. Their decoration was almost entirely Eastern, both in its *motif* and in its mode of execution. Their development was a radical one; for in place of the old Roman and old Greek construction of plain walls and columns carrying only a dead weight, Byzantine art is remarkable for the extent to which it treated construction in a new fashion as an affair of weight and counterpoise. This was provided for in the arch and pier, in the dome and its supports. The Roman basilica required no great scientific skill for its erection, whilst the Byzantine buildings dealt with some of the most difficult problems of construction, and really foreshadowed the triumphs achieved in the scientific and delicate constructions of the Middle Ages. During this period, *i.e.*, between the time of Constantine and that of Charles the Great, the Roman buildings were not undergoing any development. The long series of Popes, from the beginning down to 774, the time of Charles's conquest, had done more in the way of conversion of existing buildings, or re-using old materials, than in attempting to erect new buildings. The basilica, with its long ranges of columns, ended with a throne or apse, afforded just the accommodation that was needed for Christian worship, and the multitude of old fragments available led for ages to the construction of buildings in which the whole of the details are antique, and in which the general form is founded also on an ancient one. The long ranges of columns of all sizes and sorts are often very imposing, but the interest of the churches is rather archæological than architectural. The interest of the fragments of which they are constructed is great. They afford evidence of the slovenly execution of much Roman work, but at the same time of the freedom from all rule as to the exact dimensions, proportions, and decorations of the various orders. It is hardly too much to say that no two capitals in one of these buildings are alike, whilst the remains are, with few exceptions, of Ionic, Corinthian, and Composite, and not of Doric. Not the less were these buildings important links in the chain of development. The long lines of columns; the simple wall pierced with a clerestory above; the apse at the east end projected from a cross nave or transept, out of which other and smaller apses were formed on either side of the central one, formed a model which, as we shall see, was one of the principal foundations for the complete Romanesque buildings of the eleventh and twelfth centuries. And the buildings,—which still remain substantially on the old lines, as St. Paul Without the Walls of Rome, San Lorenzo, and St. John Lateran,—were repeated with more or less closeness at Ravenna, in the two churches dedicated to St. Apollinare at Aquileia, in San Miniato, Florence, San Zenone, Verona, and, last of all, in the ground plan of Pisa.

But if Rome was thus, as before, uninventive, this cannot be said of the city of Constantinople, where Constantine the Great established the seat of government in A.D. 330, *i.e.*, about fifty years after the erection of Diocletian's palace. Here the Romans were going back again to the East, and with an architectural result which has been one of the most remarkable in the whole history of development. Greek art had now for some centuries been all but completely thrust on one side by Roman, after the latter people had become the conquerors, and it was not until the foundation of Constantinople that it once more raised its head. The Greeks again exhibited their powers of invention in the Byzantine style, in which we see so many evidences of acquaintance with the architecture of Palestine. The churches—now converted into mosques,—still existing in Constantinople are of various dates and of various stages of development. Constantine's first church was a Roman building, like the old Basilica of St. Peter at Rome, a long building, with wooden roofs, an eastern apse, and probably an atrium. All the ornamentation was internal, in place of external. It was burnt down in A.D. 531, in the time of Justinian, and so vigorous was the architect of the new church,—Anthemius,—that in forty days from the fire he laid the first stone of the new basilica, and completed the whole church in five years and ten

months. The cupola is about 104ft. across, about a fourth less than the Pantheon; but, then, it is carried on arches instead of on a continuous wall, and in constructive skill its architect was far before the man who built the Pantheon. At the same time (*circa* A.D. 530) SS. Sergius and Bacchus was built, and this has special interest, seeing that San Vitale at Ravenna, consecrated in 547, is on exactly the same plan and design; whilst in the somewhat late Church of St. Theodore, we have a plan copied almost exactly in Sta. Fosca Torcello. And here, though it is a little out of place, you must notice how completely Constantinople gave her art to Venice, not only in these early days, but down, at least, to the thirteenth century, when the Venetians attacked and sacked the city, and carried off as spoil most of the exquisite decorative work which we now see there, and, not least among this, the four antique Greek horses which stand over the portico of St. Mark's. Indeed, it is impossible to look at any part of the original work of St. Mark's without realising that scarcely a feature is indigenous, and that all is absolutely and wholly Byzantine in plan, in elevation, in detail, and in coloured ornament and decoration.

The construction of these Constantinopolitan domes is as interesting as their design. The cupolas are ingeniously buttressed and strengthened by semi-domes below the tambour, by cross arches and vaults and domes in the enclosing aisle. And the domes, instead of being constructed of heavy stonework, were built usually of hollow pots; and in the case of SS. Sergius and Bacchus, with eight great vaulting ribs rising from the centres of the arches to the centre of the dome, the spaces between the ribs being filled in with wagon-vaulting resting on them. This extreme constructive skill would alone deserve our highest respect, even if, at the same time, all the decorative details had not been, as they are, of a very refined character. No merely architectural carving of conventional foliage has ever excelled in effect or in technical skill the best works of this school, in which, for some four or five centuries, the same detail is very closely adhered to.

Another parallel stream of art must also be noticed,—in Syria. The examples of this, dating from the first to the seventh century of our era, are numerous, very perfect, and of the profoundest interest to the student. You will find a full and admirably illustrated description of them in Count de Vogüé's "Syrie Centrale," and I advise you to consult it in our library. Here, in part owing to the climate, in part to great solidity of construction, which was wholly of stone, and in part to the absolutely deserted state of most of the sites, time has dealt with a very gentle hand, and an astonishing number of examples of this most interesting period remain all but perfect in most of their details. The earliest are—as might be expected in a Roman province—generally imitations of Roman work. But by the fourth century the influence of the native Eastern art, closely allied to that which is seen in Constantinople soon after, is seen in a well-defined system of design and ornament which prevails in a large number of buildings, and which has so much in common with much later European work as to make one at first almost incredulous as to their great antiquity. This is, however, indubitable. The most interesting and typical examples for my present purpose are the Church at Ezra, and the cathedral at Bosra, in the south of Syria, and the vast convent at Kalat Sem'an in the north, between Aleppo and Antioch. An inscription still remaining on the walls of Ezra shows that it was completed in A.D. 515, or about sixteen years before St. Sophia's was begun. Its plan is remarkable, as so many of these Syrian plans are, for its admirable arrangement. It is a square building on the outside and octangular inside, the angles being relieved by semicircular recesses covered with semi-domes. A small chancel is projected on one side, and within the octagonal nave eight columns and arches carry a quasi-dome or eight-sided vault of very pointed section, with the important feature of a tambour below it pierced with windows. Here, therefore, we have, though on a small scale, a construction which suggests, in a very definite way, the most advanced constructions of the European builders some centuries later. The plan, simple as it is, is very beautiful, and shows how extremely skilful these Syrian architects were. Even more striking is the cathedral at Bosra. This is on a far larger scale than the church at Ezra, but, unhappily, the central dome and the arcades which supported it have disappeared, and we are left to conjecture that it was the experience obtained in such works as this that led to the more stable construction of the domes in Constantinople. Here you must notice the remarkable love of the plan of a circle enclosed within a square, with a number of sunk semicircular recesses in the walls. The treatment of these, with columns carrying the wall above them, seems to be the connecting link between the recesses in the walls of the Pantheon, and the management of the semicircular recesses under the tambours of the Domes of Sta. Sophia and SS. Sergius and Bacchus. Even more remarkable than these churches is the vast convent at Kalat Sem'an, erected in the fifth century. Here, among a vast number of ruins of buildings attached to it, is still left so much of the grand church as enables us to form a fair idea of its general design. The plan is cruciform, with an octagonal centre, the walls of which are buttressed by cross arches contrived with extreme skill so as to be themselves supported by apsidal chapels in the four angles made by the junction of the four arms of the cross. The central octagon stands on eight arches, and there was no central dome, the church here being, in fact, a hypæthral building, built round the column of St. Simeon Stylites, which stood in the centre of the octagon. There is no building of which the date is more certain. St. Simeon died in 459. The base of the column on which he spent thirty-seven years of his life is still in its position. In 560 Evagrius visited the convent, and has left a most exact account of the building, which had been erected directly on St. Simeon's death, and his account agrees in every detail with the existing building. I can hardly express too strongly my sense of the singular excellence of this plan. Even with the recollections of Arnolfo's work under the dome in the cathedral at Florence, and of our own Alan of Walsingham's octagon at Ely, it is a very open question whether this far earlier treatment of the same problem is not more excellent than either. At Kalat Sem'an there are but few evidences of Roman influence. The long arcades of the four arms of the cross can hardly be said to be certainly derived from the basilica; and the great entrance at the end of the transept, three grand arches each with its own pediment, has no prototype, and is itself more than likely to have suggested the design of the very best French Romanesque, such as we see at St. Trophime at Arles. Then we find here a very regular system of window-decoration, of mouldings well adapted to their exact position, and outside the central apse we have a design which might almost be pronounced to be a work of the eleventh century, if we saw it in some so-called Lombard church in the north of Italy or on the borders of the Rhine. It is divided on plan into regular bays by attached columns placed one over the other in two tiers, and in height by a cornice which is already treated as a mere string-course. At the summit, arches springing from the caps of the columns support a cornice. These arches are somewhat large, but otherwise there is little to distinguish them from the Lombard corbel-tables of Pavia. Nothing more deserves notice than the really beautifully carved stonework of these buildings. It is truly Byzantine in character. The acanthus-leaf plays still a large part, but is treated with great variety of arrangement, and is supplemented by many charming designs of running ornaments, carved mouldings, and patterns in low relief, which speak well for the skill and taste of their designers. Not less noticeable is the fact that these buildings are almost wholly of stone. Stones of large size were obtainable, and floors are constructed by throwing arches across at intervals of a few feet and bridging the spaces by long horizontal blocks of stone exactly fitted together. It is about the most undying mode of construction ever seen in arched buildings. Nor are there any buildings in which the semi-circular arch is more freely, more honestly, used than it is in these.

(*To be continued.*)

PROFESSOR NEWTON ON GREEK ART.

A SUPPLEMENTAL lecture was delivered by Professor C. T. Newton, C.B., on Friday, at University College, the subject being the sculptures of the Temple of Zeus, at Olympia. For our knowledge of the remains of this temple we were, the lecturer reminded his hearers, indebted to the members of the German expedition, who began their investigations in October, 1875, and were now bringing them to a close. The discoveries made had been of singular moment, but he should confine himself in this lecture to the sculptures which had been found of the time of Phidias. Of these, one of the most remarkable was the statue of Niké or Victory, of which he showed two drawings. This base, which was found close to the statue in itself, was of unusual character, being triangular in outline and covered on the chief face with a long inscription, and also had a shorter one which gave the name of the sculptor, one Pæonios. We knew from Pausanias that he was the artist employed on one of the pediment groups of the temple itself. The shorter inscription said that the statue was devoted to a victory in battle of the Messenians over the Lacedemonians, and this would give an approximate date of 425-20 B.C. as the period of its execution. A cast of the statue had been placed in the Elgin room, but since it was made some other fragments had been added to the restored statue. As they would see, this Victory was a female figure leaning forward from a rock, with the left foot advanced. The drapery was flowing backwards as if the figure were moving rapidly; and there were distinct indications of wings, which must have pointed upwards. The attitude was that of the moment of descentto earth, on a mission from the heavens. The face was of exceedingly beautiful type, although it had been much mutilated, and unfortunately both fore-arms and hands had been broken off, so that we could only conjecture their position, the left arm being apparently free, and the right hand occupied in holding the drapery. The left foot must have been supported by a fragment of rock, and the flying drapery acted as a counterpoise, or flying buttress; but even then the attitude was a bold one, to be executed in marble, and suggested that Pæonios had been accustomed to work in the more tractable material, bronze. Beneath the right foot was a broken portion of what had been called an eagle; but neither in nature nor in conventional Greek art was there any such bird, and the lecturer supposed it to be either a gull or other aquatic bird, or a turtle or tortoise. Many writers had criticised this statue most severely, but even Overbeck, who pulled it to pieces, acknowledged that the effect of the whole was very sublime. It must be admitted that this Niké was inferior in drapery and execution to what Phidias would have done, but it had so great an intrinsic merit that the cast, placed in the Elgin room in juxtaposition with the matchless sculptures from the Parthenon, did not lose so much of its effect as might have been expected. Pausanias also described the sculptures in the western pediment of the Temple of Zeus at Olympia, of which the fragments have been found and put together. These, Pausanias said, were the work of Pæonios, and represented the chariot contest between Pelops and Oinomaos, King of Elis. Pelops had promised to give his daughter, Hippodamia, in marriage to the man who should defeat him in a chariot race: but if the suitor lost he was to be put to death. Oinomaos won by bribing the charioteer of Pelops to take a lynchpin out of his chariot. It was the moment before this that was chosen for the group; and at the outer angles, as in the Parthenon pediments, were personifications of the two rivers, Cladeus and Alphéus, bounding the scene of action. Zeus stood in the centre, and on either side were the chariots about to take part in the race; the wife and daughter of Pelops, some subordinate figures, and the river-gods just referred to. No representation, in the round, of this group existed in England; but in the museum at Berlin were casts of this and the eastern pediment as far as they had been restored. The scheme agreed remarkably with the description of Pausanias, but the execution was very disappointing. It was certainly not sculpture of the highest class; the workmanship was coarse and clumsy; the general position was tame and prosaic, and the figures of the horses compared badly with those he had exhibited last week from the Parthenon; indeed, some of the work might have been done by stonemasons. The discovery of this pediment had, indeed, been a great disappointment to students, and it was matter for conjecture why Pæonios should have done no better with his opportunity. He must

now pass to the western pediment of this temple, of which they also knew the name of the sculptor—one Alcamenes—and the subject, the battle between the Centaurs and the Lapithæ. On either side centaurs were to be seen carrying off the women who attended the nuptials of Pirithoos. In the centre was a figure which Pausanias identified with Pirithoos, but which, from its superior size, its pose and unmoved appearance, could not be that hero, but must be meant for a deity. Such an introduction of a presiding unseen deity, was very usual; an analogous instance being the presence of Athené and other gods at the Panathenaic procession on the Parthenon frieze. This central figure had the features and the characteristics of Apollo. In this pediment there was a great resemblance to the eastern one—the same slovenliness of execution and coarseness of working, and the result did not at all correspond to the reputation of Alcamenes among his contemporaries. The lecturer added that he visited Olympia with Prof. Colvin in 1876, being the first persons, except a German scientific man, to visit the site after the excavations were commenced. Mr. Colvin and he made independent notes, and published them on their return without having communicated together, and in the opinions they expressed the German writers generally concurred. They agreed in saying that the sculpture gave evidence of great originality and vigour of conception, but that the execution indicated that the designs were executed by other and less skilful men than the artists who designed them; and this opinion had been confirmed by Overbeck, in the last edition of his book. Was it not probable that the designs, having been sketched out by Pæonios and Alcamenes, were carried out by native artists of Olympia, where we have no evidence of such a school of sculptors as we knew to have existed at this period at Athens. The date of these sculptures might be fixed within a few years, and was from 13 to 18 years later than the execution of the chryselephantine statue of Athené in the Parthenon, which was completed c. 438 B.C. A statue of similar materials was erected to Zeus in the temple of Olympia, about this period, in or about 432 B.C. As this statue must have absorbed, in execution, a vast amount of treasure, the accumulation of generations of offerings, was it not possible that an insufficient sum remained in hand to allow of the employment of skilled artists upon the pediments which were in progress about this time, and that in fact the reputations of Pæonios and Alcamenes were sacrificed to the statue of Phidias? He must now pass to a subject of deep interest, but one only creating longings which would probably remain unsatisfied till the end of time—that of the great chryselephantine statue of Zeus, which stood in this temple. Such statues were made from a desire to combine the representation of flesh in ivory with the most precious material at command. Of the statue of Athené we knew the dimensions and the value of the gold employed—some 44 talents; here we had no particulars of the cost of the Elisian figure except a playful allusion in Lucian, who in speaking of a person who had stolen two locks from this Zeus, observed that the spoil amounted to six Attic minæ each—about £300. The only ancient representations of the statue were two copper coins of so late a date as Hadrian, one of which showed a figure seated in a chair holding a Victory in its right hand; the other coin merely displayed the head. From Pausanias we knew that the statue had a robe of gold covered with flowers, that it carried a sceptre in the one hand and in the other a figure of Victory. The chair was carved with figures of heroes and with agonistic contests, and at the base was the Birth of Aphrodite from the Sea. Barriers kept the multitude from approaching too closely to the throne, and on these barriers were many subjects painted by Panaios, the brother of Phidias. This statue stood about 42ft. in height. Indeed, carping critics suggested that if the god stood up his head would go through the roof of the temple, the height of which was 68ft. It suffered so much from the damp that it became a question whether it should not be moved from the temple; but an ingenious person was found who repaired the cracks in the ivory, and it remained in a perfect state till the time of the Emperor Caligula, who formed the impious notion of removing it to the Capitol at Rome, but was deterred by the peal of laughter which burst from the presumably concealed priests in the statue, when the effort was made. It was said that it was subsequently removed to Constantinople, and was destroyed in a great fire, but there was no authority for this statement. One of the most recent discoveries at Olympia had been that of the position of the painted barrier, which was carried in front of the throne, and round the impluvium in the centre of the temple, which part, as its name implied, was open to the sky. Of the statue itself, there was no hope that we should find any remains. Many years since M. Quatremere de Quincy made a drawing showing a conjectural restoration of this great work of art, which agreed well with all we knew of it from the description of Pausanias. The testimony of ancient writers as to the effect and appearance of this statue was very marked; Cicero, Dion Chrysostom, and all others who referred to it, agreed that it possessed an extraordinary dignity of expression and pose. Dion Chrysostom, indeed, said that it was far removed above the cares and toils of this life, and that its contemplation took one into another world—just such language as he might use about the Parthenon sculptures. In conclusion, Prof. Newton referred to some drawings of parts of the twelve metopes on the temple of Zeus, which, we were told by Pausanias, illustrated the labours of Herakles, and of every one of which fragments had been found. The treatment of these metopes was hard and austere, and not very skilful; and they were far inferior in design and execution to those of the Parthenon.

In a summer course of lectures, to be commenced on May 6th, Professor Newton announced that he proposed to treat of the funeral rites and sepulchral customs of the Greeks and Romans.

ART-WORKMEN—PAST AND PRESENT.*

By John Roddis.

(*Continued from page* 227.)

ANY mention of art-workmen, however perfunctory, would be incomplete if Grinling Gibbons were forgotten. There is something in the spirit of Gibbons much akin to the honest perseverance of Vischer, though he never had Vischer's initial advantages in life. For a long time he was working about London carving architectural details for just what the builders would give him, and speaking from some knowledge of the value builders, as a rule, put upon art details, I can assure you, gentlemen, that his remuneration would not be much. I mention this that we may not be surprised when we find that the young man has had enough of it; that he has taken a small shed at Deptford, having bought some wood of his own, he has decided that if he must work and starve he will at least starve upon work that can afford him pleasure. It was in this shed that, by lucky accident, Evelyn found him—but we will ask Evelyn to tell us about it in his own pleasant way. (January 18th, 1671.) "This day I first acquainted his Majesty with that incomparable young man Gibbons, whom I lately met with, in an obscure place, by mere accident, as I was walking by a poor solitary thatched house in a field in our parish, near Sayers-court. I found him shut in, but looking in through the window I perceived him carving the large cartoon of Tintoret, a copy of which I had myself brought from Venice, where the original painting remains. I asked if I might enter; he opened the door civilly to me, and I saw him about such a work as for curiosity of handling, drawing, and studious exactness I had never before seen in all my travels. I asked him why he worked in such an obscure and lonesome place; he told me it was that he might apply himself to his profession without interruption, and wondered not a little how I had found him. I asked him if he was unwilling to be made known to some great man, for I believed it might turn out to his profit; he answered that he was but yet a beginner, but would not be sorry to sell off that piece." However, nothing came of the King's patronage: Charles was too indolent to encourage genius of any kind. But Evelyn did something better than speak to the King; he introduced Gibbons to Wren, and we soon after find the young man carving ornamental details at Windsor Castle. I do not propose to follow him through his great works at St. Paul's, and at Chatsworth, but I propose showing you how nearly his system of working resembled that of Pisano, and the other great workmen who have passed under our notice to-night. We have seen that Pisano formed the centre of a little school of his own. That he worked constantly himself and inspired the same ardour in those about him; so that from him other masters went out into the world forming similar circles of their own, until his influence perceptibly touched and coloured the taste of his time. And this was exactly the case with Gibbons. People are apt to look at the vast amount of labour necessary to produce the carvings at St. Paul's, Chatsworth, Southwick, Petworth, Exton, Canterbury, Oxford, and a dozen other places, and exclaim that "it cannot be all Gibbons's!" No, certainly not. It is by the little company of carvers in which he stands as king. He was the ruling mind; but instead of working with his two hands only, he trained eight other hands to follow his mind in all things, and the owners of them were Watson, Laurens, Dievot, and Selden, and when working under the direction of the master it would be difficult to distinguish the work of one from the other—though, perhaps, Watson rose nearest to the general skill of Gibbons. Only let us bear this important point in mind always—the master worked constantly with the men. If he had been content merely to receive money profit from their labour, if he had been an employer and not a workman, we should probably have heard nothing whatever of him or his school. There is one other thing I should like to mention in connection with Gibbons, for it is always pleasant to notice generous patronage in high places. In his declining years it was suggested to George I. that an art-workman of such excellence should not longer remain without some mark of royal favour, and the bountiful King, after taking some considerable time for due reflection, appointed Gibbons his Master Carver—*with a salary of eighteen pence per day.* That is about half the pay of a door porter, but still sufficient to establish a precedent for the honourable reward of art-workmen, which, I believe, has never been overstepped by any member of the House of Brunswick.

It may perhaps be considered by some that we have no right to claim Flaxman as an art-workman. Many would raise the cry that "he gained his fame as a sculptor." By which is meant, in modern phrase, that sculpture is high art only when it is isolated, and has little or no claim to be an art at all when it is applied to some useful object. For instance, if Cellini lived to-day, his bronze statue of Perseus would take a much higher rank than his salt-cellar, though it is acknowledged by every one who has ever written intelligently of the two works, that the latter is an immeasurably superior example of art. But this is not an error grown in our time; it is part of the sublime stupidity which has risen up and spread over the nation during the past 150 years—though, happily, to-day there are signs that it is being dispelled. Many very "superior" people thought Flaxman lowered his prestige by modelling pottery for Wedgwood. It was astounding, they said, that a man who was taking high-class commissions in Rome should be sending home models for plates and dishes at the same time. And not only doing it openly, but encouraging the young men about him to follow his example. The fashionable world was filled with delight when he drew the outline sketches of the Inferno. "Society" said that was high art of the very highest kind—a very different thing from modelling cups and vases. So much was thought of them that they were published with a description in four different languages, for circulation over Europe. But mark the verdict of time. Any bookseller will obtain you those drawings for a crown—all the languages included. But a good piece of Wedgwood ware modelled by the hand of Flaxman is now worth its weight in gold. Let all art-workmen keep their eyes upon that fact, for it is significant, and marks the dawning of a new day. To my mind, Flaxman possessed in an eminent degree the true instinct of the art-workman. He was modest, and could, therefore, make his art subordinate to the object it was applied to. If he designed a vase the body of the work would take the outline of a vase in every part of it, and his charming groups were used merely as accessories. A proud and vulgar man would have had the vase all figures—his work first and vase afterwards. He was honest;

* A paper read before the Birmingham Architectural Association (see p. 189).

therefore he treated his subjects in a manner best suited to his material, not as if he were designing for embossed silver. And that I take to be one of the highest merits in a workman, that he shall recognise the material he is working in, and not strive to strain its capability. If he be working in wood it will allow him great freedom, and let him take advantage of that freedom to the full extent; but should he attempt the same treatment in stone, he would be unwise, for though he may with time and care do something that will astonish the groundlings, he cannot help but make the judicious grieve. To show how seriously Flaxman entered into the duties of a workman, and how well he understood that the cost of production must necessarily tell for or against the application of good art-details to useful objects, we will, in passing, glance at one of his bills. At this time he was about thirty years of age; and the bill will be one hundred years old next month:—

"Mr. Wedgwood to J. Flaxman.

		£	s.	d.
1781.	A shell Venus.....	1	5	0
March 7th	A Bacchante	1	5	0
	Cupid and Psyche.....	1	4	0
	Two busts of Rousseau and Sterne		16	0
	A sitting Flora	1	5	0
May 20	Moulding a bust of Dr. Fothergale	1	4	0
		6	19	0

Received in full of all demands by John Flaxman."

Now I cannot but think that this bill is an instructive one. In this age, when it is considered vulgar to price art productions in any thing but guineas, the shilling difference between "a Bacchante" and the group of Cupid and Psyche seems peculiarly strange. But in this we may see the rectitude of the man; he had arranged with himself a certain scale of payment by the hour, and to that standard he would honestly work. Wedgwood understood this, and that made the employment of Flaxman possible. If the great potter had stood in fear of his modeller surprising him with "fancy" prices for his work, it would have restrained his action, for no business man should trade without knowing the ground upon which he stands.

It is perhaps not generally known, and may be worthy of mention here, that two of the greatest architects of modern times discovered their two leading art-workmen in Birmingham. Half a century ago Pugin was building Oscott College and Barry was busy with the Birmingham Grammar School. At that time a young man who had spent several years in the studio of Sir Francis Chantrey was engaged as Master Carver at the seat of the Goffs at Perry Barr. Being near at hand, he modelled the capitals for the Birmingham Town Hall, and, while engaged upon this work, made the acquaintance of another art-workman who was at that time engraving letters and carving monuments "for the trade." The two became fast friends; and Barry having seen some productions by the monumental sculptor, entrusted him with the carving of the Grammar School; while Pugin secured Chantrey's old pupil for Oscott. At that time the Earl of Shrewsbury was about to commence the great additions to Alton Towers, and the building of his magnificent church at Cheadle was to follow. Both these important works were placed by Pugin in the hands of his protégé, and he lived to finish them, but, broken in health by overtaxed energies, he returned home to die; and the good earl, like a true patron, placed a monument in his church recording the faithful services of the sculptor. Barry took his man to London, and ultimately placed the sculpture and carving of the new Houses of Parliament under his direction. I need hardly remind you that his name was John Thomas. The other was Thomas Roddis, whose unworthy son will perhaps be pardoned for briefly recalling his memory to-night. Now both these men had much of the true spirit of the old artists in them, for they worked constantly, and directed personally everything that fell to their hands to do; and it may not be uninstructive to local men, as showing what constant work can accomplish, if they will compare the details on the Grammar School, carved at the time I have stated, with the vigorous statue of Thomas Attwood carved by the same hand a quarter of a century later. These two names must serve to link the past with the present, and in the little space that remains I will endeavour, as briefly as may be, to sketch the position of art-workmen in our own time, though in doing so it will be like walking out of a garden into a wilderness.

As we look out upon the broad prospect of art to-day, what do we see? Painting!—striding the scene like a colossus, while the industrial arts creep about under its huge legs to find themselves dishonourable graves. What is our Royal Academy? Painting!—with a few specimens of isolated sculpture, but seldom, or never, sculpture applied to any useful object. If we have an exhibition of "old masters" who are they? Painters; they are the only masters "society" is capable of appreciating in our time. What are the exhibitions of provincial "art societies"?—pictures only. What is the great and special teaching of all our art schools?—picture-painting. And what has it all ended in? It has ended in this, that we have no national industrial art left to us. If you ask the intelligent young artists of England why they do not take up one of the applied arts, they will tell you plainly that no means exist of drawing public attention to such works, that however high they may rise in excellence there is no mark of honour whatever awaiting them; and, lastly, that the general public in England have long ago lost the power of correctly judging art-workmanship when they see it. This last assertion may seem to be a very sweeping one; but let me illustrate by a notable example. I know a region where there is a newly-erected memorial fountain—that is if we may call a church steeple a fountain—and upon it are played some of the most absurd antics that ever appeared outside of a nightmare. Did you ever give a little child a box of block letters to play with and observe what absurd words its baby ignorance would put together? If you have done this, I am sure you have found it amusing, but not half so amusing as the singular hash of ornamental details put together on the fountain I speak of. Should you ever examine that remarkable structure, you will find dog-tooth ornament of the 13th century used in conjunction with diaper of the 14th. Crockets of the 15th century—but of a distinctly German type—with capitals cut in imitation of Early French work. The panels are composed of modern naturalistic foliage, and the spout block is cut in the style known as Queen Anne. And, as seasoning to this wonderful salmagundi of styles, the flat spaces are filled with garish mosaic, by way of lacquer I presume, without which no true bit of "Brummagem" would be complete. But droll as all this must appear, it is not half so droll a sight as seeing certain notables of that region—which shall be nameless—gravely walking round that architectural scarecrow declaring it to be a work of art. It is said they intend having a museum of ornament in those parts, and you will probably agree with me that it is time. And it may not be too much to prophesy that ten years after such a museum has been established that "work of art" will be discreetly carted away. I ventured to say in the opening words of this address that for every score of Englishmen who could intelligently criticise the points of a good picture to-day, not more than one could be found capable of judging the real merits of a good piece of enamel, carving, gem-setting, metal-work, or any similar art. That is the great rock ahead: for English art-workmen are struggling without being understood by their countrymen. For the most part they are mere factory hands. Their arts have been divided, and sub-divided, until the men are little better than pieces of men, simply so many wheels in a vast machine, a machine without brains, barren and uninventive. It has ground up the old ideas of the Greek, Roman, Gothic and Renaissance, and now it is grinding up the arts of India and Japan; but of itself it has invented nothing—absolutely nothing. How many men would be required—presuming that this country could produce such a work in our time—how many men would be required to produce that salt-cellar by Cellini? First there would be the designer; he must have a room apart. His drawing would be copied in wax by the modeller. Then would come the silversmith, to be followed by the enameller, the chaser, the burnisher, and others. Cellini did it all: he did it all, and, therefore, all parts were masterly, and though his skill was applied to one of the humblest vessels of the table, it has been a living charm for four hundred years. If Cellini had lived in our time, and could have been kept from our "art-training" sufficiently to work as he did, do you know what would have happened after the production of that salt-cellar? A deputation of capitalists would have waited upon him with a scheme for forming a new Art Company to be called "Cellini and Co., Limited." And when they had explained their programme of stamps and dies, and the number of articles they expected to produce in an hour, it would have been a delight to see the proud old artist rise in his anger, demanding what they meant by an "Art Company," or whether they intended starting a Poetry Company also, to called "Tennyson and Co., Limited," because the one would be as reasonable as the other. He knew that the art was in the individual, and that is what we have to revive to-day, the glorious individuality which marked the works of Pisano, Cellini, Vischer, Limoges, Gibbons, and Flaxman. That is the work we have before us, and the first steps taken should be in quest of that individuality, or, at least, in quest of ground where it could grow. As for fine art schools—reform them altogether. If a student draws a design for enamel, show him how to mix the colours and fire it. If he models a work in wax, let him take his model to a bench, and teach him how to beat it up in silver. If he models in clay let him put it into a kiln and burn it. If this were done you would have schools of art worthy of the name, not mere picture-mills. By these means you would teach young men that the hammer and the file are as much art-tools as the brush and the crayon; and you would pluck out of our generation that piece of modern snobbery which tells us that soiled hands are disgraceful. By all means in our power we should endeavour to have annual exhibitions of industrial art in every manufacturing town in the kingdom. By doing that we should not only be lifting up for public recognition arts that are now contemptuously thrust from our view, but by constantly bringing them forward we should gradually instruct our present instructors. A most necessary thing to do.

Let it not be understood that I decry the grand art of painting, or that I am insensible to the high position Englishmen have gained for their country in that beautiful art. My quarrel is that in our admiration of the rose we have neglected every other flower in the field; and I believe it is our duty to show our young men that there is honour to be got, even as young Vischer got his—by making so slight a thing as a thimble beautiful. You will remember the old tale that the Spanish Queen would have her famous carver, Gaspard Beccera, cut her such a figure of the Virgin as should astonish all Spain. The wood was brought from a distant province, but, after many trials, the carver failed to reach his ideal. It was cast aside, and another block brought to him—this time from the Holy Land. Again the artist tried, and again he failed, and to escape the anger of his Royal Mistress he fled from court into a hiding place. There he threw himself down at night in a miserable hut before a log-fire, and over his broken spirit came the calm of sleep once more. But in his dreams he saw the fair ideal stand before him, and as it stood a commanding voice cried aloud to him, "Arise, Gaspard! The wood is before thee—shape the thought that stirs thee!" Springing to his feet he seized a log from the fire, and from it carved one of the most marvellously beautiful figures ever produced by human hands. It was destroyed during the wars of Napoleon; but Longfellow has embalmed it in immortal verses, a few of which I may aptly quote in conclusion:—

Then a voice cried, "Rise, O Master!
From the burning brand of oak,
Shape the thought that stirs within thee!"
And the startled artist woke,

Woke, and from the smoking embers
Seized and quenched the glowing wood;
And therefrom he carved an image,
And he saw that it was good.

O thou sculptor, painter, poet!
Take this lesson to thy heart:
That is best which lieth nearest;
Shape from that thy work of art.

And the voice that cried to Gaspard is crying to the young artists of England to-day, "Arise! here, at hand, are gold and silver, iron and steel, wood and stone. Take up these and shape from them your works of art."

THE ROYAL SCOTTISH ACADEMY.

THE 55th Exhibition of the Royal Scottish Academy was opened a week ago, being a fortnight later than last year. The increase in the number of pictures sent has this year been unprecedented. However badly it may be faring with other branches of the national industry, the manufacture of paintings seems to have been in a flourishing way. The walls of the Academy can rarely find places for over 1,100 subjects, but 3,000, or 500 more than any number sent in former years, have sought admission this year. This large surplusage is partly accounted for by the later date for opening; contributions not finding a place in the Glasgow Exhibition coming eastward. It is also partly accounted for by the increasing number of amateurs, and possibly of professional artists also. Thanks to schools of art, and cheap production of lithographs and photographs of well-known works by master hands, the desire to possess originals seems to be getting widely diffused, and the general proficiency exhibited is evidence that the pictorial art is one which requires only a better perseverance, to attain a degree amply sufficient to make its pursuit a source of pleasure to the public and of profit to the artist. Genius has no longer to make romantic struggles for development, but is elbowed by a crowd of aspirants to its honours, educated by the schools of art. The juvenile essay must, in most cases, fall below the standard of even tolerable mediocrity, and numbers of such are sent, but it is understood that the greater number of paintings sent away were well worthy of a place, and some could not find admission from not complying strictly with the regulations. It seems a pity that such numbers should pass out of public recognition, when it might be profitable as a speculation to have a supplementary exhibition in a private gallery. As it is, the committee have found space for only 1,050, which is a total considerably under the average of other years.

Whatever difficulty this great number of works from which to select may have occasioned in making the selection, that selection has every chance to be a good one, and even a hurried inspection seems to indicate that there is more of interesting subjects than usual. Portraiture is plentiful, from the full-sized presentation portraits down to the more generally interesting representations of youth and beauty. There are three portraits by Millais. These, of course, owe much to the interesting character of the subjects, and the peculiar methods of delineation.

The encouragement given to production does not appear to have developed much ambition to step out of the more commonplace and homely paths of the art. The numbers of what may be called historic or dramatic pictures of the higher class are few and far between. 216, "Napoleon on Board the Bellerophon," by Orchardson, is a well-known work of the artist. More than equal to it, in pathetic power to interest, is No. 97, "The Thin Red Line," by Robert Gill. This picture represents the unbroken line of steel presented by the British infantry to the attack of Russian cavalry at Balaclava. There is little of the confusion of battle in the piece. The figures lack somewhat of the finish of other figure subjects; and the red line, when looked at in detail, is somewhat obscure; but the effect of the composition at its proper distance brings out the idea of the artist to perfection; the red line with unbroken continuity is distinct and vivid, and forms a striking contrast to the foe, represented by one dismounted soldier on the ground, and a veteran officer on the point of falling from his steed.

"The evening of Culloden," by Hole, is another picture of the tragic aspect of a battle-field; but the meaning of the various attitudes of the few figures represented is left very much to the imagination of the spectator to discover. Mr. Barclay gives "An Incident in the Life of Robert the Bruce," in which all the figures are expressive; but the countenance of the principal party lacks altogether the dignity which it is natural to expect, when the peasant mother is devoting to the service of a fugitive monarch the lives of her two only sons. Unlike the hero represented by Hutcheson's sculpture in the other room, Mr. Barclay's "King Robert" looks like a quiet country gentleman, without a care to trouble him.

There are great numbers of less ambitious subjects of great dramatic power, such as Erskine Nicol's "Storm at Sea," Sir F. Leighton's "Golden Hours," "The Prodigal Son," &c.

Landscape in oils has numberless excellent examples, of which one of the best is "Benvenue," with some nice foreground painting of rock, and pool, and heather. "The fragments of an earlier world," &c., quoted as motto to the piece is not, however, at all descriptive of this piece of landscape.

The picturesque in architecture is not a great favourite with oil-painters. There are hardly any pictures of the sort, and these few display a great amount of ignorance or indifference in regard to the proportions and details of the subject represented. Such artists have never studied, like Turner, the constitution of the architecture. "Jedburgh Abbey," by A. Pengal, is a very common example, in which not only leading features in the construction, but the immovable features of the landscape are tortured and displaced for the purpose of producing some pretty and conventional effect of light or colour. A very pretty sunset light, in this instance, is given; but the Abbey, which is a good way off the river, looks here as if it could tumble into it; and the bridge, which is close at hand, is drawn to a scale which puts it almost out of sight.

It is only in the water-colour departments that architecture gets anything like justice from the artist. There are numbers of excellent examples here, which show how much the architecture of a landscape can effect in producing the picturesque.

Here too, however, when detail is seen, the ignorance or indifference of the artist is too frequently apparent. As an instance, 209 professes to be a truthful representation of the "interior of the Catholic and Apostolic Chapel" in Edinburgh. The whole aim of the artist seems to be to depict, no one can tell what. The light is not that of fading day, and the architecture has nothing of the various aspects she has given it. It has been recently built, is thoroughly dry and well heated, and the strong point of its interior is certainly the sanctuary; but not the sanctuary of the artist, which is only a dismal hole, ignoring almost entirely all the pretty effects of light and shade produced by the rich arcading of the walls.

As a contrast see (1,045) "In Leuchars Church," where the artist has evidently intended to give the building a conventional colouring and light to suit the ruined Norman work. The detail, to a great degree, necessarily becomes obscure, but the leading lines of the arcaded surface are so truthfully portrayed with a little indication of the rich details, that the beauty of the work is very much enhanced, and we have some confidence in the picture as giving a fair conception of the building as it really is. (858), "The interior of Lindisfarne," by M. P. Taylor, shows a careful study and appreciation of construction. It represents the skeleton of the partially dismembered structure fighting a losing battle with the wind. Mr. Sessels, in 830, sends an effective picture of "Santa Maria del Miracoli," in Venice. Mr. Burbridge contributes two elaborate and attractive works (1011), "Antwerp Cathedral," and (1044), "An interior of the church of St. Somare," near Antwerp. In the latter, the rood screen, which is richly decorated work, is shown well in the light, and is depicted with masterly fidelity, at least with no confusion. The picture is enlivened by professional figures and banners, and the perspective of the lofty choir and the mellow light are all excellently rendered. "Old Edinburgh" is illustrated by numerous examples, of which the public do not seem to weary.

Not less remarkable than the extent to which the picturesque in architecture appears in this exhibition, is the collapse or almost entire absence of woodland landscape. Street pieces, coast scenes, lake scenery, buildings, and figure subjects abound, but so far as trees and foliage constitute the beauty of the landscape—the appearance of the walls would almost justify Dr. Johnson's opinion of Scottish scenery, that it had nothing of the kind to show. Of the two or three exceptions, a very characteristic example is Walter Paton's "Dunfermline, and its Abbey from the South." The abbey is far away, rising above the town in purple light, and in contrast with some fir trees, and local colour in the foreground.

In the architectural department, the number exhibited has fallen off in the same large ratio that other works have increased. There are only 22 drawings in all, or about half the diminished number of the year before. This result is, probably, the faithful reflection of the great depression of building enterprise throughout the country, as the names of several regular contributors are this year absent from the list.

The matter of arrangement has been easy, as most of the drawings are made to a reasonable scale, and they are all placed together, and in good positions.

Foremost in interest are the drawings sent to illustrate the architectural designs of the new medical schools of the University extension. This important work is one which would require a great amount of illustration from the variety of design, characteristic of its many peculiarities. Unlike the old building, where the accommodation is provided round a single court, the new requires for air and light the formation of several quadrangles, and in each of these there is very considerable variety of arrangement and detail. It is not easy accurately to define the style of the building as a whole otherwise than by saying that it bears in most of its parts a strong resemblance to the works executed during the early times of the Rennaissance. Edinburgh, in its public buildings, has several kinds of Classic, simply treated as in the Register-office, or more florid as in the Post-office. She has a reminiscence of the Erectheum in the High School, and of the Parthenon in the Royal Institution, and something like a powder-magazine in the Academy itself. The new Medical School has no affinity in its design with any of these buildings, and is evidently trammelled by no rules other than those which an extensive acquaintance with good examples will supply, and the exigences of the plan suggest. No. 1 gives a "bit" of one of the "Quadrangles," in which ordinary Classical detail is conspicuous. But Drawing 2 takes us outside, and shows the south-west angle from the meadow-walk, in which there is nothing whatever of the regular Classical detail. This perspective shows the ornamental portion of the south front, and gives a much better notion than the lithograph of the whole building of the altitude of this portion of it.

The now famous Glasgow Municipal Building competition might have been more extensively represented. Only one (914), by J. Armstrong, Edinburgh, puts in an appearance. This is one of the domed examples, which Sir C. Barry did not seem to like. It is a geometrical elevation of the George-square front, and is a very pleasing and well-proportioned composition, if not possessing any striking feature, with exception of its tower and dome.

(923) "Proposed Buildings for the Spiers Institution, Beith," is a water-colour perspective of what appears to be a very large undertaking. It is only the distant and picturesque effect which forms subject for critical inspection, and the result is far from being satisfactory. The whole composition lacks the unity which is a first essential of all design. Imagine one of the long German Romanesque churches, with its lofty steeple, walking up to contact with an enormous double villa—forming the other half of the whole—and such is its aspect as represented in the picture. Each portion in itself seems excellent, but the conjunction is utterly destructive of anything like the unity of the whole.

(922) is a large pictorial representation of "Dunheath Castle," and some alterations presently being made. The interest here lies not so much in the architecture, which is very ordinary Scottish Baronial, but in the castle and its site. The architecture of the additions is in good harmony with the original. The castle stands upon a rocky knoll, if not the summit of a hill, and has much of the aspect of the real castle of the older time. The water-colour artist has probably desired to intensify this aspect of the building.

Of smaller mansions there are some excellent examples, in which the influence of the Queen Anne revival is apparent. Of these the most attractive every way is 915, "Ryldene, Essex," with its lofty windows of mullioned lights and well-arranged projections. There is some novelty in the arrangement of the porch, which has balcony on the top, but the door itself lacks the dignity and importance to be expected in such a building.

Street architecture is represented by two drawings, which form a striking contrast. (886) "The *Glasgow Herald* Office" is the perfection of design for a street-front in the Classic style

of the Queen Anne period, but with nothing of extravagance or littleness about it. The design embraces a heavy cornice projection, above which is a floor and two dormers of good design and prominence.

(893) "The Scottish Conservative Club" is, so far as Classical architecture is concerned, a very poor affair. The Conservative club is very Conservative of the old orthodox and commonplace decoration. Its front to Princes-street will not form a conspicuous feature, and is hardly what an institution of this kind would lead the public to expect. The only prominent member of its frontage is the heavy and deeply projecting balcony, borrowed from its neighbour, the New Club. It is not a pretty feature, and has lately shown signs of giving way. A balcony of this sort carried in a straight line over all projections is both constructively and æsthetically bad.

Extreme economy in all decorative detail appears to be the order of design for 894, "View of the Principal Staircase," which is a good drawing in perspective of a very wide, but very ordinary, staircase.

Church architecture is represented by six drawings, etched. (892) "St. James U.P. Church, Paisley," appeared, though in another guise, in the exhibition of last year. This church, apparently, is a reproduction of the Free Church of Mayfield, only the tower and spire are transposed and the perspective taken from a much better point of view. This is the only drawing which is done to a scale preposterously large. This intensifies the more obvious defects of the design, without illustrating more clearly than a smaller scale would have done, the ordinary lancet detail. One cardinal mistake is the great projection given to the double transepts, making the length across nearly, if not quite, equal to that of the nave. This occasions a dread expanse of blank wall, for which the architect, Mr. Blanc, seems to have a partiality, to compensate for cutting up his surfaces elsewhere. But it shows the audience too much to right and left of the pulpit, and could easily be mended by giving better proportions to the nave. The tower is massive, but the spire itself and its junction with the tower are not so happily designed. The junction is effected by an octagonal belfry chamber; but the corner pinnacles are poor, and there is a want of something to conceal or adorn this somewhat weak and awkward arrangement, never very satisfactory without something of the sort. The spire itself is covered with an interminable succession of equi-distant ornamental bands. These have no meaning as representing the building courses, and add to the cost without improving the monolithic aspect of the pyramid.

(924) "New Church at Juniper-green." Juniper-green is a small village near Edinburgh, and has got a city church. The design is Classic, and is evidently a large galleried church with two handsome towers in front, and the usual treatment of this kind of plan.

(900) "West Front of a proposed U.P. church, Edinburgh," is a church designed in much the same style as that recently opened at Rosehall. All the details are well proportioned, and harmoniously arranged with a good eye for the beauty of the Romanesque.

(897) (935) are drawings of two small Early Gothic country churches, which bear unmistakeable marks of being first essays in church architecture. In the former the author is at great pains to elaborate a front, in which the details of buttressing, &c., are altogether diverse and inconsistent with the fair simplicity of the rest. The front is not only buttressed with massive Transition projections, finished with arcaded pinnacles, but the upper part of the gable is finished with arching, and this grandeur carries nothing but a rather low and heavy-looking belfry. The large window underneath is a combination of three lancets, utterly spoilt by the introduction of a trefoil over each. To get this the proportions of the lancets are curtailed. The trefoil-light, without any connection with a system of tracery, is about the ugliest thing to put on the top of a pointed window, and the interior effect of plate-tracery of this nascent stage is anything but happy.

In the other example, the same unreasoning tendency to add unnecessary accessories, to avoid the appearance of simplicity, is manifest; but the funds have been scanty, and there is a lack of the ambitious, which has produced a comical effect. The church would have been very well, if well had been left alone. But at one corner of the gable is a small erection like a sentry-box, with a low octagonal-fronted belfry immediately above. The only purpose of this arrangement seems to be to save the beadle in a storm of rain. But the author has ignored the function of a belfry in placing it so very low; and the ordinary gable belfry would have been much better for the bell, and much less costly. To balance this rather stumpy projection at the one corner, is a very thin one at the other. The simple or moulded skew put is not sufficient, and a slight pinnacle is added, buttressed, to keep it steady. The buttressing, however, is on the wrong side, where no thrust can possibly occur; and it is omitted where it might appear to be possible. The author is more at home in house architecture, and Mr. Bloxam's "House at Morningside" is a very pleasing example of the suburban villa.

(917) "Interior of Morningside U.P. Church," appears to be a tentative experiment in interior perspective, which had better have been left at home, for the credit of the church and the Academy. It would require no little skill in draughtsmanship and colouring to make such a wide and lofty interior as this appears to be, look anything like itself. The perspective plan has not been studied, the exaggerated height dwarfs the pillars of the nave, and the drawing is no fair interpreter of the design as it will appear when completed. The roof, which has a yellow wash to indicate that the carved vault is boarded, does not rest upon the walls directly, but on hammer-beams, concealed with pendentive groining. The arcades appear to be constructed of Byzantine stilted arches; and the pulpit and accessories are very indistinctly rendered.

LEGISLATION AFFECTING DWELLINGS.

A PROTEST against arbitrary interference with private interests under the plea of the welfare of the general community, was made by Mr. John Honeyman, in a paper read before the Architectural Section of the Glasgow Philosophical Society on Wednesday week. Attention was drawn to the many encroachments—in themselves insignificant, but persistent and cumulative in character—made upon the liberty of individuals under the Public Health and other Acts of paternal legislation, and he urged that the danger was greater in similar action attempted by local authorities than in that of Parliament, because the smaller bodies were less controlled by high education and larger experience of affairs. The building regulations adopted by many town councils, the Greenock Police Act of 1877, and the additional powers now sought by the Glasgow Town Council, were adduced as illustrations of the high-handed mode of dealing with private interests adopted by local bodies, and the author pleaded that legislation affecting dwellings should be altogether taken from the hands of local authorities, and be dealt with by Parliament alone, by means of general building and sanitary Acts. These could be carried out through the agency of local authorities, subject to central control, and private Acts for street improvements and other special purposes could still be left in the hands of the urban authorities. The great and pressing needs were for, first, an amendment of the Public Health Acts; and secondly, a General Building Act for Scotland. In many districts of Scotland no building regulations existed at present, and in every case where they did exist they required amendment. Further than this, in no instance in Scotland was the administration of building laws in the hands of a competent executive. In the larger towns the administration was in the hands of a dean-of-guild court. That of Glasgow was probably the most efficient of the kind in the kingdom, and yet it was hardly possible to conceive of a worse organisation for the purpose. The Dean of Guild was simply appointed president because he was chosen to fill the chair of the Merchants' House, and he was in no sense a representative of the ratepayers. He sat as supreme judge with eight "liners," four other merchants, and four members of the Trades' House, and it was hardly possible to imagine a more ridiculous constitution for a judicial body dealing with scientific and technical questions. Such courts should be totally abolished, and for them should be substituted an executive body representative of the public—perhaps some committee, of the town council. But this new body should only carry out the details of general and imperial measures. Such laws, when relating to construction, should be simple, and should require some well ascertained minimum of strength. Neither the regulations nor the character of the inspection carried out under it should relieve builders from the fullest responsibility for their work. As to such matters as those of fireproof and stable construction, general legislation would be comparatively easy; but in dealing with sanitary arrangements we became involved in a labyrinth of perplexity, principally arising from the large and miscellaneous crowd of advisers, all claiming to be experts in sanitary science. It would be desirable, however, for sanitary legislators to consult alike the medical sanitarian, the practical sanitary engineer, and the trained architect, in laying down the regulations adjudged to be absolutely necessary. Two kinds of legislation affected the sanitary conditions of dwellings, and these ought not to be confounded or mixed together; the one dealt with the arrangement and construction of the dwelling itself, and should be provided for by a general Building Act; the other related to the use of the house, and the conduct of its inmates, and should be provided for in a Public Health Act. The author proceeded to treat in detail upon the regulations which the town council of Glasgow recently sought to have sanctioned by a provisional order, expressing the opinion that many of these proposed an unwarrantable interference with private interests. While a sufficient amount of free space for light and air ought to be secured in populous places, the prohibition of "hollow squares" was an extravagant curtailment of freedom. Again, while overcrowding should be forbidden in densely-peopled districts, the object should not be attained by making the height of ceilings not less than 10ft. Any mere combination of materials, however eccentric, employed in the formation of separate apartments, did not affect the general health, and was outside the scope of a Building Act. Questions as to the healthfulness of a house, and the number of persons who might occupy it, should be dealt with under a Public Health Act. An absolute requirement of 10ft. minimum height of rooms would affect the value of all existing houses, and greatly increase the cost of building; it was unnecessary for the public welfare, as healthfulness did not depend on height, but on cubic capacity and completeness of ventilation. Moreover, a low building was not only more commodious and cheaper, but was more easily ventilated, for in the majority of cases the fireplace formed the only means of change of air, as people stopped up all openings above that level. The author showed the absurdity of the opinion that density of population was necessarily an evil, by adducing the low death-rates in well-planned and cleanly-kept artisans' dwellings, even when situated in the most thickly-populated parts of towns. Such mischievous regulations as that which sought to fix the height of the rooms at 10ft. would render abortive every effort to ameliorate the condition of the houses of the working class by rendering it impossible for anyone to erect them profitably, and so as to let at moderate rents. He had been informed that the improved dwellings erected in London could not have been built remuneratively if subject to such regulations as were sought by the Corporation of Glasgow relative to free spaces and height of ceilings. In short, such restrictions violated the principles underlying all beneficent laws—the obtaining of the greatest amount of good for the greatest number, coupled with the jealous conservation of the liberty of the subject.

The church of St. James, Halifax, is undergoing internal restoration from the designs of Mr. W. S. Barber, of that town. All the heavily-leaded windows have been removed, and replaced by new lights in cathedral glass, supplied by Mr. Stafford, of Halifax; a new pulpit has been erected by Messrs. Jones and Willis, of Temple Works, Birmingham; gas-standards are being supplied by the Midland Metal Works, Coventry; and the walls, ceiling, and gallery-fronts are being decoration by Mr. Binns, of King's-cross, Yorks. The chancel-floor is being laid with encaustic tiles, a new organ is to be erected, and open stalls are being erected in the nave, Mr. Gaines, of Staunary, being the joiner.

Mr. C. M. Crawshay, surveyor to the local board of Heston and Isleworth, has been remanded on a charge of embezzling various sums of money amounting to about £700, the property of the local board.

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ILLUSTRATIONS.

NEW RESIDENCE AT CANNES.—ST. AUGUSTINE'S CHAPEL, BRISTOL.—WAREHOUSE, GREAT EASTERN-STREET, SHOREDITCH.—DESIGN FOR ALMSHOUSES.—BREWERY AT DAYBROOK.—ARTISTS' HOMES: NO. 12, SECTION OF HOUSE AT LITTLE SUTTON, CHISWICK.

OUR LITHOGRAPHIC ILLUSTRATIONS.

RESIDENCE AT CANNES FOR MONSIEUR LE CHEVALIER DE COLQUHOUN.

The sketches illustrate the design for a residence now in course of erection at Cannes for Mons. le Chevalier de Colquhoun. The lower stage of walling, as far as the level of first floor, is of ashlar, the upper part being constructed of alternate bands of ashlar and thin red bricks, while the projecting gables are of weathertiled timberwork. The design has been prepared by Messrs. Medland and Powell, of 89, Chancery-lane, W.C., the general disposition of the plan having been arranged by Monsieur le Chevalier himself.

ST. AUGUSTINE'S CHAPEL, BRISTOL.

This building, situated opposite to, and within one hundred yards of, Bristol Cathedral, is known locally as the "Mayor's Chapel." Built originally in the 13th century, it was formerly called Gaunt's Church, and the hospital which was then attached to it went by the name of "Gaunt of Billeswick," because "Maurice de Gaunt built this hospital in Billeswick Manor, in the north-west suburb of the town of Bristol, near the monastery of St. Augustine, before A.D. 1229, for one chaplain, and one hundred poor people to be relieved every day." Leland's notice of this establishment runs thus:—"One, Henry Gaunt, a knyght sometyme dwellying not farre from Brandone Hylle, by Bryghtstow, erectyd a college of priests, with a master, on the green of St. Augustine." In the view given, but little of the 13th-century building here referred to is to be seen, though the Early English sculptured corbel table on the south side of the nave clearly belongs to this period, as does also much of the plain masonry of the west front. The north and south walls, with their windows, also belong to Gaunt's building, although Perpendicular tracery has in some cases been somewhat maladroitly fitted to the Early English openings in place of the simple cusped heads which they originally contained. Among the monuments are effigies of two knights clad in mail, their right hands resting on the hilts of their swords, their shields borne upon their left arms, and their legs crossed, showing them to have been knights of the Holy War. Whom they are intended to represent is uncertain, but they most probably belong to the Berkeley or Gourney families. In 1680 the ill-famed Captain William Bedloe was buried here near the principal entrance, without any memorial or inscription. He is said to have been concerned in the Rye House plot, in the reign of Charles II. Louis Knapp.

WAREHOUSE, GREAT EASTERN-STREET.

This building has been erected by Messrs. Waters and Son, of 34, Eastcheap, in a plot of land held from the Metropolitan Board of Works, with two frontages of 40ft. to Great Eastern-street, and to Willow-street at the rear. The front portion, including a basement and four floors over, is used for the manufacture and carrying on of an extensive pickle business, and has a large double cartway, giving ample access and egress from Willow-street, a lift direct from which serves all floors. In the Willow-street portion are also lofty stables 15ft. high, harness-room, and loft over, and a carter's residence over the double cartway. The materials are common stocks and red brick bands, cornice, &c. A simple treatment of brick piers and trabeated openings has been adopted, as lending itself most readily to large window-space and ample light. A little brick carving has been sparingly introduced into gable over the crane, doors, and in brick cornice. The work has been carried out by Mr. B. E. Nightingale, builder, of Lambeth, Mr. Aston Webb being the architect.

"BUILDING NEWS" DESIGNING CLUB.—A BLOCK OF EIGHT ALMSHOUSES.

Our Designing Club plate this week furnishes illustrations of the selected design for a block of eight almshouses, situated on a corner site with a 10ft. fore-court to each house. The drawings explain themselves, and full dimensions are given. "Black and White" is the author of the design. Brick and timber are intended for the proposed buildings.

NEW BREWERY AT DAYBROOK, NEAR NOTTINGHAM.

The brewery of which we give an illustration this week is now being built for John Robinson, Esq., at Daybrook, a suburb of Nottingham, from the designs of Mr. Herbert Walker, C.E., of Basford, Nottingham. The building, contracted for by Messrs. Bains and Turton, of Basford, is now approaching completion. The building is designed to contain a thirty-quarter plant, and is arranged on the "tower" principle, so that there is no pumping of wort. The cold-liquor back of cast-iron is in the roof, and the liquor is heated in a cast-iron boiling-back fitted with copper coil. The mash-tun is of cast iron, and fitted with Southby's patent automatic mashing machine, and with Couron's patent rakes and copper sparger. The malt is raised to the upper floor by a double cone sack-tackle worked by steam where it is passed through the mill, from whence the grist shoots into a hopper immediately over the mash tun. The wort from the mash tun runs into a steam-jacketed wort copper, fitted with copper fountains, &c. The hop-back, which is of cast-iron, is underneath the copper, from whence the wort runs over one of Pontifex and Wood's patent refrigerators to the fermenting rounds, which are of English oak, and placed in a separate building. There rounds are fitted with revolving skimmers and attemperators. Beneath the fermenting tuns are the settling backs, from which the beer will be finally racked into casks. There are splendid rack cellars on the same level as the racking-room floor. The beer will be lifted from the cellar to the waggons by a cask-hoist, worked by steam-power. A horizontal steam-engine placed in the basement drives the whole of the machinery. A well, yielding a splendid supply of water, has been sunk in the brewery, and the liquor is lifted from thence to the liquor-back in the roof by a set of three-throw pumps 5in. diameter. The building has been designed so as to enable the brewery to be worked with the minimum amount of labour, and although everything throughout is of a most substantial character, no money has been expended in unnecessary decorations. The buildings in the rear consist of washing and cask shed, stables, coopers' shop, &c. To make the premises more complete, there are capacious maltings attached consisting of two sixty-quarter sets.

ARTISTS' HOMES: NO. 12.—MR. W. EMERSON'S HOUSE.

Last week we gave a double-page view and plan of Mr. William Emerson's House at Little Sutton, Chiswick, with a description of the building. To-day we publish a longitudinal section, taken through the hall and drawing-room, with part of the dining-room on the left and part of the library on the right-hand side. The beautifully-modelled plaster frieze, with the central figure of Fame, is shown in the drawing-room, and illustrates Chaucer's "House of Fame," the whole being elaborately coloured in harmony with the purposes and general tone of the room, which is in blue and gold. The hooded mantelpiece in the library is entirely in concrete, to be richly painted and gilded. The drawing, with the assistance of the description given by us last week, will explain itself.

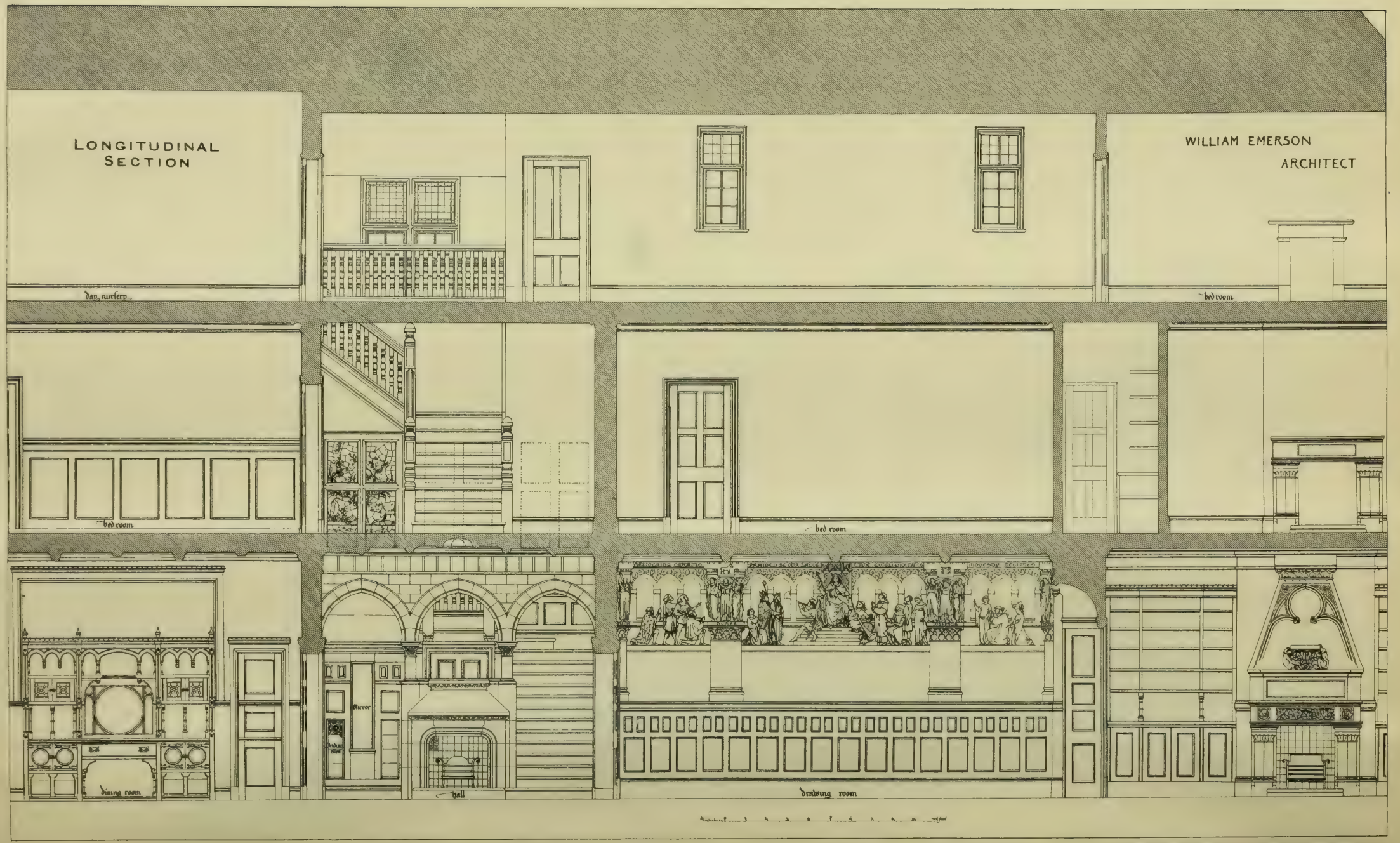
DETACHED BELL-TOWER, PEMBRIDGE.

The detached Tower of Pembridge, illustrated last week, is an interesting example of the few ecclesiastical buildings in England in which the tower or turret is detached from the church itself and treated as a campanile. Three bells are herein hung, and the timbering to support the weight of these is very massive, and of complex construction. The village possesses a number of half-timber houses, and there is also a small covered ancient market building of great interest.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE AWARDS OF PRIZES.

A SPECIAL general meeting was held on Monday evening, Mr. Whichcord, F.S.A., in the chair. It was resolved, by acclamation, that, subject to her Majesty's sanction, the Royal gold medal for the year 1881 be presented to Mr. George Godwin, F.R.S., F.S.A., past vice-president. The recommendations of the council for the award of medals and other prizes, 1880-81, having been read to the meeting, were discussed, and the following awards were made:—The Soane medallion and £50, offered for a county-court for a provincial town of 30,000 inhabitants, was awarded to the author of design bearing the motto "Utility," whose name and address were found to be Roger Thomas Conder, 2, Wyndham-crescent, Junction-road, N. A certificate of honour was awarded to the author of the design bearing the motto "Set-square" (whose name and address have not been received by the secretaries), and design bearing the motto "Tendez la main droite," by Mark John Lansdell, Bedford-row House, Great James-street, W.C., received hon. mention. The Tite prize (value £30), offered for the internal covered area of a royal exchange, was awarded to the author of the design bearing the motto "Forum," viz., Robert William Collier, Holyport House, Shortlands, Kent. A prize of books of the value of five guineas was given to the author of the design "Mens," by William Tyson Gooch, Hôtel de Nice, Rue des Beaux Arts, Paris. The Grissell Medal, for a tower and steeple in any style of architecture, was awarded to the author of the design bearing the motto "Contendo," viz., Frederick Miller, 5, Upper Spring-street, York-street, Portman-square, W. A prize of books of the value of two guineas was awarded to the author of the design under the motto "Simplicity"; and a similar prize to the author of the design under motto "Winter's Tale," these being John H. Curry, 22, Southampton-buildings, W.C.; and Arthur Beresford Pite, 44, Bloomsbury-square, W.C. A certificate of honour was awarded to the author of the design under motto "Clavis," viz., Herbert Goodall, 17, Burlington-road, Bayswater, W. As to the Institute Medal and five guineas, offered for drawings, it was resolved that, though there was only one competitor, the author of the drawings of Kelso Abbey, bearing the motto "Norman," be awarded the medal and five guineas; the name and address were found to be Arthur Percy Gunston, Herne Hill, Tunbridge Wells, Kent. The Institute Medal and ten guineas, for essays on the towers and steeples designed by Sir Christopher Wren, were awarded to the author of the essay bearing the motto of a Wren, viz., Andrew Thomas Taylor, Moorgate Chambers, Finsbury-pavement, E.C. Certificates of honour were awarded to the authors of the essays bearing the mottoes "Circumspice" and "Sixteen Hundred and Sixty-six," Thomas Rowland Hooper, Redhill, Surrey, and Frederick Ernest Eales, 9, Welbeck-street, Cavendish-square, W. The recommendations of the Council for the subjects for medals and other prizes to be competed for during the Session, 1881-82, were discussed, and with a few slight amendments adopted.



ARTISTS HOMES Nº 12 LITTLE SUTTON, CHISWICK.

Photo-Lithographed & Printed by James Akerman, 6, Queen Square W.C

BUILDING NEWS DESIGNING CLUB.

BLOCK OF EIGHT ALMSHOUSES

SITUATED ON A CORNER SITE WITH A TEN FEET FORECOURT TO EACH

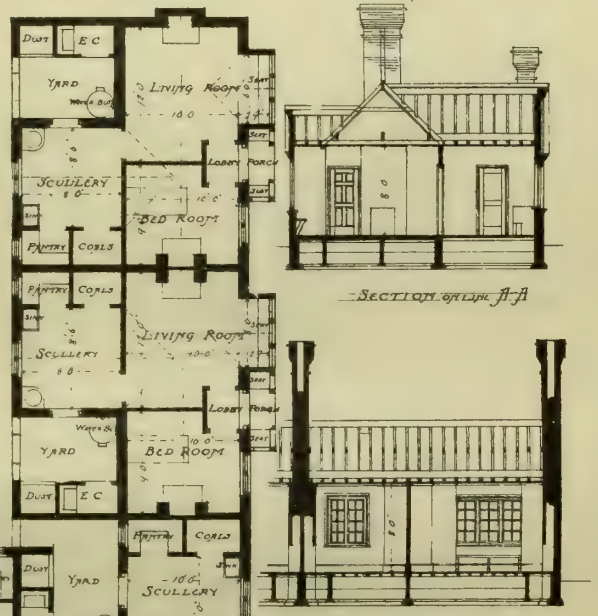
FRONT ELEVATION

RETURN SIDE.

0 1 2 3 4 5 6 7 8 9 10 feet

BLACK & WHITE

SELECTED DESIGN



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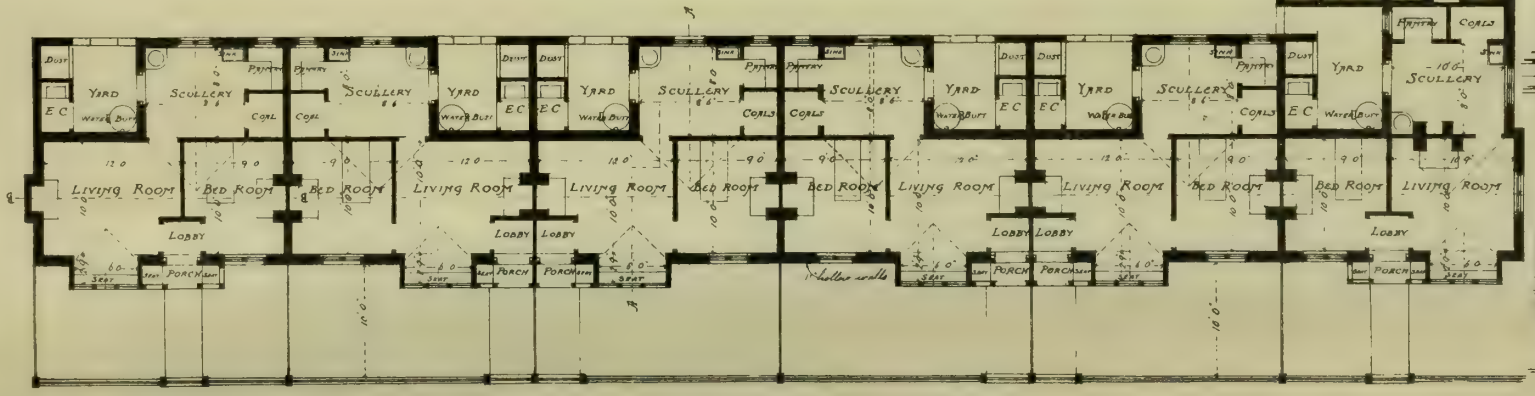
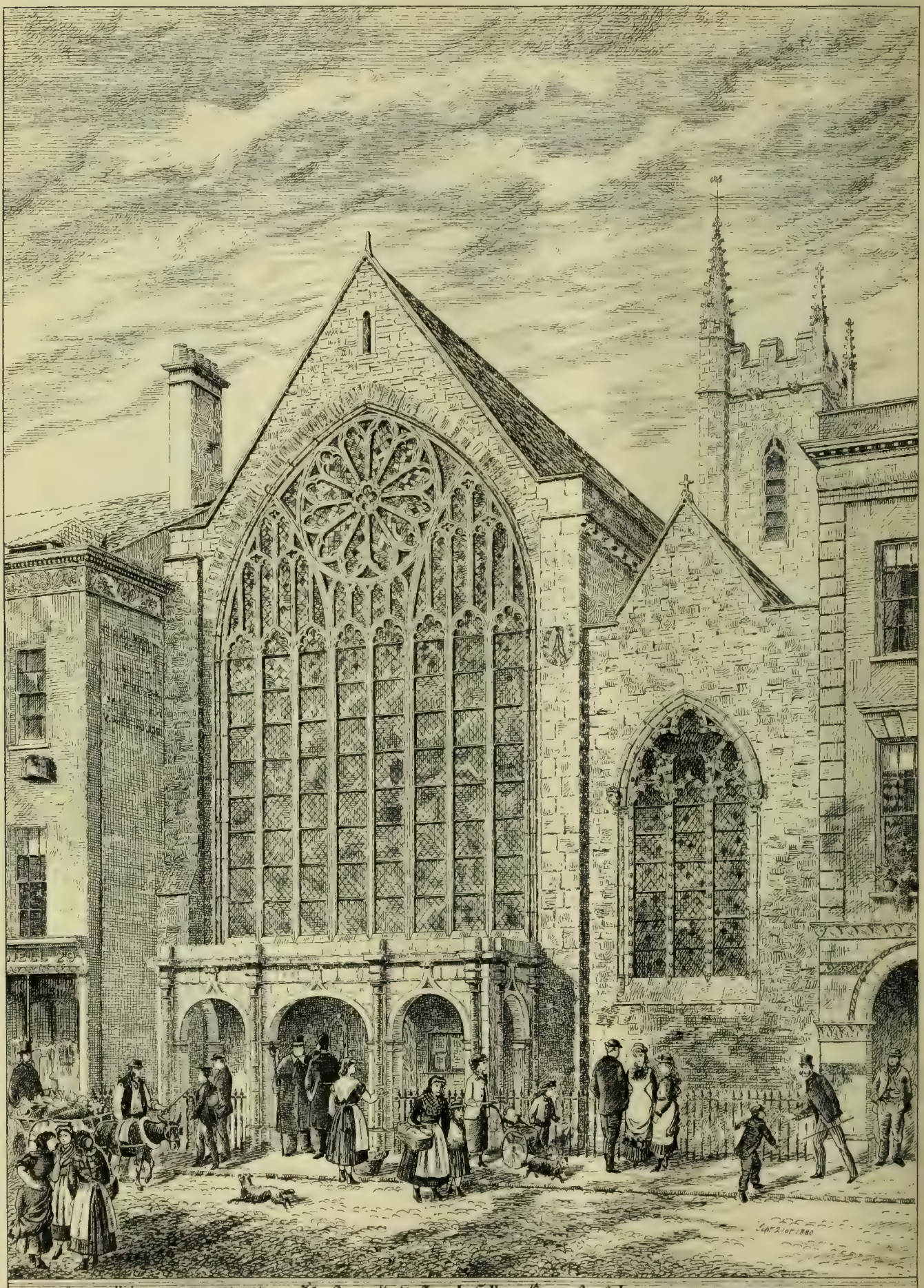


GROUND PLAN.

BACK ELEVATION.

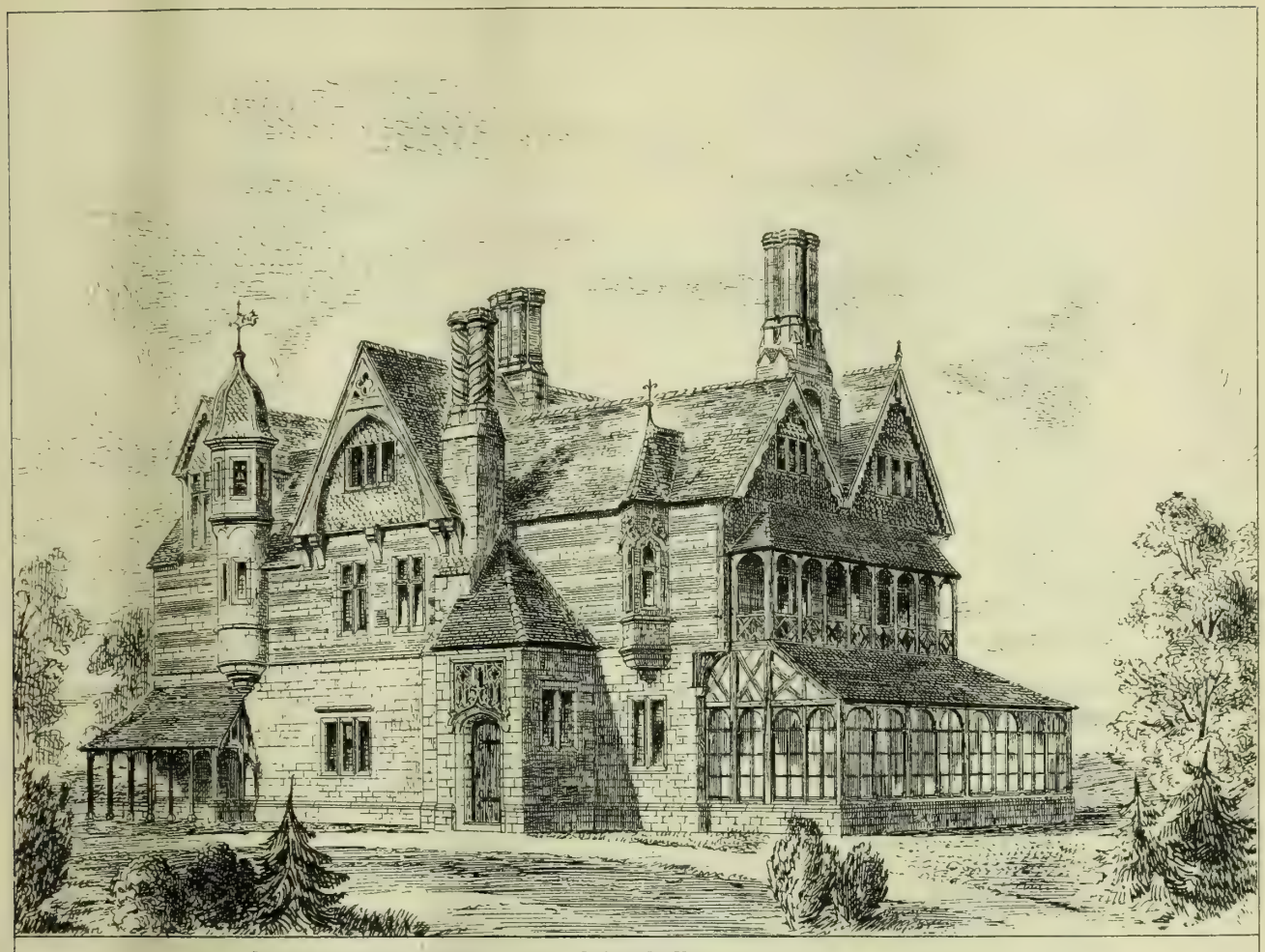
Photo Lithographed & Printed by James Akerman, 6, Queen Square, W C

LIBRARY
OF THE
UNIVERSITY



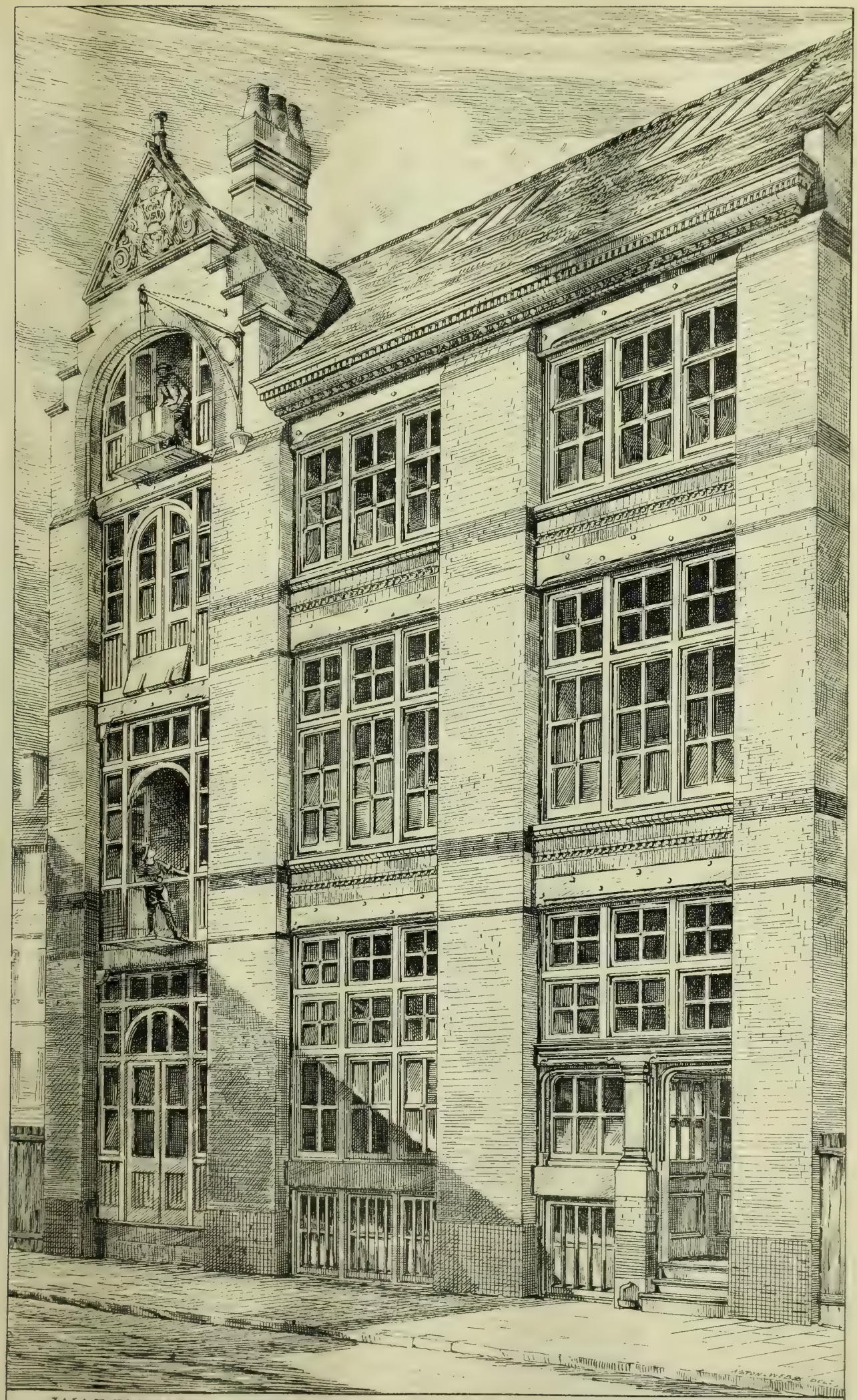
LOUIS KNAPP DEL.T — St. Augustine's Chapel, College Green, Bristol.

Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.



NEW RESIDENCE AT CANNES
FOR MONSIEUR LE CHEVALIER DE COLQUHOUN
MEDLAND AND POWELL
ARCHITECTS

Photo-Lithographed & Printed by James Akerman 6, Queen Square W.C.



WAREHOUSE. GREAT EASTERN ST SHOREDITCH. ASTON WEBB ARCH

Photo Lithographed & Printed by James Akerman & Queen Square W.C.

THE DAYBROOK BREWERY, NEAR NOTTINGHAM.

MR HERBERT WALKER, C.E. ARCHITECT

GROUND PLAN

Scale of Feet

Photo Lithographed & Printed by James Akerman, 6 Queen Square W.C.

THE FABRIC OF THE CHURCH AT THE PRESENT DAY.

(*Concluded from p.* 278.)

THE most perfect type of church is, I suppose, the nave with a clerestory and lean-to aisles—the arrangement of nearly all the great Mediæval cathedrals, abbeys, and parish churches; Bristol Cathedral, with its splendid domical-vaulted nave-aisles and absence of clerestory, being notable among the exceptions to the general rule. The mania for totally abolishing columns from churches, or worse still, putting up meagre cast-iron ones of little less substance than stone or marble, has also led to another great mistake—wide bays, which, I need scarcely say, is destructive to the scale of a church, and dwarf its proportions. I have previously spoken about churches without aisles, but must now allude to St. Bartholmew's, Brighton, where there is somewhat the effect of a nave arcade on each side, owing to the deep recesses. But externally the appearance is that of a huge building rising abruptly from the ground and sadly needing the assistance of aisles to lead the eye gradually down to its base. There have, during the last few years, been many churches built in London of which one can only fairly see the west front and east end, the sides being closely abutted on by the neighbouring houses, such as St. Augustine, Stepney; St. Mark, Coburg-road, Old Kent-road; St. Mark, Walworth. In such situations the external ornamental appearance of the sides of the church is of no great consequence, provided everything is plain and substantial and good, as everything connected with a church should be, whether prominent or not. The mode of roofing St. Mark's, Walworth, is economical and suits churches where only the west front is seen, not the sides. I have more than once heard the churches in the South of France held up as examples suitable for our imitation, such as St. Etienne, Perigeux, where the domical arrangement of vaulting exists. This necessitates the width of the bays and that of the nave being the same—*i.e.*, square.

The difficulty about having a series of domes to the nave and chancel is that they must either be treated externally as a feature (and this to English eyes would be rather contrary to the quietude and repose usual in the body of a church, and interfere with the effect of the tower). Or, on the other hand, the domes might only be visible internally; but that involves waste of space inside the roof, the highest point of each dome only occurring at intervals, and not continuously along the ridge, as in a pointed vault. Whatever authority there may be for constructing stone galleries in early examples of churches, as at Santa Agnese, Rome, or in some of those in Germany, the feeling at the present day is against them, though it must be admitted, if galleries are designed at the same time as the rest of the structure, and form a part and parcel of it, they may æsthetically be an improvement rather than otherwise. But in these days of free and open churches, there is a general consensus of opinion that there ought to be no distinction whatever, no elevation of any one portion of the worshippers above the others, with the sole exception of the choir, where the special dress and position north and south, instead of east, sufficiently explain the reason of the raised platform. Perhaps such a splendid example as the triforium gallery at St. Augustine, Kilburn, ought to convert one. But in this instance the practical use of the gallery is clearly subsidiary to the architectural effect of the same. And, moreover, those who occupy this isolated position are, or were, not the ordinary congregation, but a special section of them. A west gallery over a vestibule is not only very effective and easy to contrive, but can be used for a large organ (as in many of the foreign churches). Acoustically the effect is then very good. But as, happily, in the Church of England the music used in the service of the Holy Eucharist is *not* performed in a west gallery, the west organ could be used for voluntaries or on great festivals, where, by the electric action, it could be played by the organist sitting near the chancel. The organ for accompanying the choir should certainly be placed immediately adjoining the chancel. I shall presently be saying a little more concerning the best position of the organ. Notwithstanding the elaborate arguments against the use of columns in churches of our Faith, and the variety of ground-plans of early and Mediæval buildings which have been produced having no columns, the time-honoured nave-and-aisle plan is still the usual one both in churches where High ritual is carried on, and in those where Evangelical doctrine is held. There is one objection I have sometimes heard alleged against a very wide nave with narrow aisles. It is this. Why go to all the fuss and expense of columns and arches, merely to obtain aisles 5ft. or 6ft. wide, which are virtually only useful as passages to the seats? My reply to this would be that, even in a wide aisle-less nave, there must of necessity be side passages as well as a central one. Supposing the nave was made so much wider as to take in the space occupied by the narrow aisles I have mentioned, other difficulties arise. The nave must be of great height to look in good proportion; the absence of the arcade would make it not so good for sound; it would not be easy to light artificially. It would also be much more difficult to cover in, as one must have very strong construction, the roof being more exposed to wind and weather owing to its altitude. The walls must be thicker, and the buttresses of greater strength. All this would cause expense, while the pleasing feature of the aisles attached to the nave would be much missed, and the light and shade caused by them lost. It must not be supposed that these remarks contradict those made in an earlier part of this lecture. I am now alluding to naves of *more* than 35ft. or 40ft. span. Up to that limit, height and grandeur of effect can be secured without any very great difficulties. But when larger dimensions have to be dealt with, and the valuable constructing aid of aisles has been dismissed, it is not very plain sailing. Much has been said as to the relative advantages of bricks pointed internally as compared with rough stuccoed or plaster walls. I am free to confess, as far as I am concerned, that a church of stately proportions, even if built of plain stock bricks, relieved with red bands here and there, or of red brick with bands of bluish grey bricks or courses of ashlar-stone, looks better than a dismal expanse of bare stuccoed walls, particularly if the roof or ceiling is slightly decorated in colour, if there are cathedral rolled glass quarries, or better still, good painted glass, and if a warmth of tone is afforded by a few different-coloured stones, marbles, or granites. It is true that the plaster walls can be decorated in colour, but the question of expense is generally too serious an obstacle to having figure-subjects, neither is the want of them much felt on the nave and aisle walls, though over the chancel-arch a good subject is a great desideratum. Unfortunately however, in the majority of cases where the church has been opened with rough stucco on the internal walls and consecrated by the Bishop, it is considered finished for all time, even the simple inexpensive masonry pattern not being suggested. In a brick church, sunk ornamental medallions of stone or terra-cotta could be introduced at intervals, to be filled with sculpture by degrees, or a kind of frieze of decorative hand-painted tiles fixed under the windows, having a series of lozenge or other ornamentally-shaped panels for mosaic or other decoration. These panels can also most appropriately be filled with memorial inscriptions relating to those who have worshipped in the church. This plan has been carried out in two or three churches in my knowledge, and with admirable effect. Instead of the embarrassing white or black marble tablets, interspersed with a pseudo-Gothic tabernacle or a brass, none of which features harmonised, and were all fixed in a haphazard style, a pretty decorative feature has been gradually added to the church in lieu of a series of objects incongruous the one with the other. Brick is now such a usual material for churches, that it is superfluous for the architect to hesitate employing it in lieu of stone. The well-known work of Mr. Street, on the "Brick and Marble Architecture, of North Italy," first brought this subject into prominence. Brick is a most natural material for adoption in England, especially for those who are sticklers for precedent. It was little used in church architecture until the 17th century, but we see it at East Barsham Manor House; Eastbury House, Essex; Sutton Place, near Guildford (where terra-cotta is also much used); at Hurstmonceaux Castle, Sussex, and elsewhere. The more decorative features of a design should, as a rule, be in the upper part of the building; the dado or the base-mouldings being kept severe and plain in treatment. To put very delicate ornamentation in places where it cannot be properly seen, is, of course, absurd, though not infrequently done. But it is quite possible to have a rich design for the ceiling treated in a bold, vigorous style, suited to the distance from the eye. Now, in modern roofs this axiom is often quite disregared. A stately church is built, the walls of the chancel lined with marble and alabaster, and a magnificent reredos, or, perhaps I should rather say altar-screen, erected, extending almost from floor to roof. But the roof to the nave is of a construction not greatly superior to that of a good barn—a series of rafters, braces, and collars, iron tie-rods to the principals, and the space at the back of rafters, lath plastered and whitened. This is very true and honest work, appropriate enough to a simple little village-church; but in a fine town-church we ought to look for something better and more dignified. Look at those grand old churches in Norfolk and Suffolk, where the hammer-beam roofs are of the richest description, frequently with the remains on them of the original colouring and gilding; the cornices filled with a profusion of the strawberry-leaf ornament, or with carved bosses—oftentimes with a series of angels with outspread wings carved in wood, acting like a frieze to the cornice. Then the ends of the hammer-beams have lovely figures of angels, either bearing various musical instruments or holding shields with the emblems of the Crucifixion and others; while all the available space in the roof-trusses is filled with elegant traceried panelling. Few architects at the present day take as their basis this beautiful type of roof, fearing, perhaps, it is too late in style; but there is really no difficulty in adapting the form to one's requirements. To speak of the vestries, it is generally necessary now to have two, one for the clergy another for the choir. In towns, where space is limited the other will be placed above the other, and made to form an effective feature externally. The most convenient and decorous position for the vestries is adjoining the chancel, particularly in those churches where there are frequent celebrations of the Holy Eucharist. The passing to and fro between the chancel and the vestry must then be frequent with the servers. It is inconvenient for them to be obliged to come into the nave every time they have occasion to go to the vestry. In some churches, as at Christ Church, Ealing, the clergy vestry is at the side of the chancel, while the choir vestry is at the west end under the tower. This involves the clergy walking down the nave, to offer the prayer with the choir, and then coming back with them in procession to the chancel. After the service the clergy must again go to the other end of the building and then return to their own vestry. Whereas, if the two vestries are placed adjoining the chancel, with one door in the north or south wall of chancel between the end of the choir seats and the altar-rail, and another door from the vestry into the nave aisles, both entrances can be used as occasion requires. The organ has, of late years, been so much increased in size and capacity, that its best position becomes a matter of great importance to the architect, as well as to the organ-builders, and those who pay for it. Those who are not music-mad must confess that sometimes too much is sacrificed for these gigantic organs, such as that recently placed in Salisbury Cathedral, in the N. transept and choir. One position for the organ, which I believe on very good authority to be excellent for these instruments, and from an architectural point of view may be rendered telling and effective, is a gallery or deep recess on the north side of a *wide* chancel, over the vestry, boldly corbelled or bracketed out. In the noble church of St. Martin, Brighton, designed by Mr. Somers Clarke, Junr., the organ is in this situation, and I am told by him that although the recess for it is comparatively small, yet the effect of sound in the building leaves nothing to be desired. At St. Michaels, Camden Town, now in course of building, the same idea for the organ is contemplated. I think rather too strong a point has been made of the baptistery being in a small distinct aisle or apse opening out of the main building. By raising the font on a flight of steps (of which there are many charming instances in Mediæval work), arranged in a picturesque form, by the pyramidal tabernacle-work canopy, sometimes reaching its spire-like form half-way up to the roof, or by a further extension of the dignity appropriate to Baptism,

by the erection of a kind of baldacchino, or stone canopy supported on pillars or piers, and with inclosing gates (as at Luton Church)—by all these means, I say, the font can be worthily enshrined. The arrangement of steps is a more important point than is always considered. If the site of a church offers such a chance, a bold flight of steps, up to the west entrance, with a broad platform at the top as a breathing-place before one enters the church, is a valuable feature in giving dignity and importance to the building, as must be patent to all of us by the example at the cathedral just outside these doors. It seems curious that although such a fine effect is obtained by climbing up a number of steps to a church, almost the same effective result is secured by going *down* into a church after one has entered on a level. It is, of course, essential in this case that there should be a good wide and long platform inside, not a little narrow ledge, when there is a risk of tumbling down. If the first bay of the nave is on the higher level, the appearance is very good, as in the case of the Cathedral of St. Denis, in Paris. Mr. Micklethwaite, in his book on "Modern Parish Churches," has well pointed out the error of raising chancel-floor too high above that of the nave. He urges that the steps should be further eastward—otherwise the floor of the chancel becomes considerably foreshortened. As a rule, a chancel raised three steps, that is, 15in. or 18in. above the nave, is quite sufficient up to the end of the choir-seats. Then there should be an interval of 3ft. or so, as nothing looks worse than the occurrence of steps immediately at the east end of these seats. Further east, perhaps, three steps up and a platform sufficiently wide for the communicants, and then the kneeling-steps. If there is any room to spare, after an interval of flat within the altar-rail, there might then be three steps up to the platform on which the altar stands. Such is a good arrangement of steps to speak about or imagine. Unfortunately, when it comes to be carried into practice, the scheme becomes almost Utopian, on account of the expense, for all these steps and platforms take up space. In any church each step ought certainly not to be less than 1ft. wide, and would be better if wider. Consequently, supposing there are ten steps from the nave-level up to the altar-platform, the chancel must be of considerable length. The interesting old church at Llanaber, near Barmouth, North Wales, of the Early English period, has a most dignified arrangement of steps for a small country parish-church. There are five steps up to the chancel, and then five more up to the altar—an unusual plan. This building, in other ways, ought to teach us the lesson of simplicity and appropriateness to its situation, with its long narrow lancets of a beautiful proportion, and its general severity of treatment. There is no straining after effect, yet nothing can be more successful than the result obtained by this reticence of design.

THE MANUFACTURE OF ARTIFICIAL HYDRAULIC LIME AT MEUDON, NEAR PARIS.

A FEW years ago an English writer on limes and cements suggested in our columns the advisability of preparing an artificial mixture of chalk and clay, rather than continue to employ the fat chalk-limes which at one time were so much in favour with London builders. It was at once urged that, possessing, as we do, such vast deposits of grey chalk-lime or lime rich in silica and aluminum, and with a broad belt of liassic-lime stone running across England from Somersetshire to Yorkshire, it was quite unnecessary to think of preparing an artificial hydraulic lime, or to go to the expense of improving the limes made from pure chalk. It is impossible to deny that we have in this country many very excellent building limes; still, such limes do not exist in all parts of the country, and in the North of England the limes chiefly burnt from the carboniferous and mountain limestones are notoriously bad for structural purposes. Such being the case, a description of the great manufactories of artificial lime near Paris, which for some reason or other are rarely visited by English travellers, may not be without interest.

The rocky escarpment crowned by the fortress of Issy, which overlooks the plain of Meudon, is a chalk ridge, and the hill of Issy is an outcrop of the Upper or flint-bearing chalk, which here is from 1,200 to 1,500 feet in thickness. The belts of flint run through it in perfectly horizontal lines or strata, showing its undisturbed geological position. The quarries of Issy are extremely interesting, as the workings are all in parallel galleries or tunnels having arched roofs, each gallery being three mètres wide and seven mètres high. These galleries are very numerous and intricate, and extend for great distances under the hill, as the quarrying has been practised since 1829. The French Government engineers have the entire control of the quarrying operations, and decide upon the positions of the galleries and tunnels. The chalk is got by piece-work; the men being paid 1·20 franc per cubic mètre loaded on to the carts; this is about equivalent to 9d. per cubic yard. Considering that the men have to keep the galleries neatly trimmed, and the roofs a true arch, the price seems small, though we were given to understand that a good workman easily earns 5s. per diem at this work. The chalk, when brought to the works, is mixed with 20 per cent., by measure, of clay brought from Argenteuil. This is a grey plastic clay with veins of yellow and red, indicating the presence of iron. It is an excellent brick earth, and is largely employed at the potteries in the neighbourhood for the manufacture of tiles, pans, drain-pipes, &c.

The mixture of the chalk and clay is effected in two different ways; the one the summer plan, the other chiefly practised in winter. As the drying of the compound is accomplished without artificial heat, it is necessary during the winter to effect the mixture of the chalk and clay with the least possible quantity of water, and to do this it is usual to employ during the cold months an ordinary vertical pug-mill similar to that in use in brickworks. The chalk and clay are thrown in by shovelfuls at a time, five of chalk to one of clay (the chalk naturally contains about 4 per cent. of clay). This compound is pugged twice, and then spread in small lumps on the floor of large sheds to dry. It becomes dry enough to put in the kilns in about twenty-four hours, or that spread one day can be burned the next. The calcination is effected in small running or continuous kilns with interstratified fuel; the fuel consists of small coal and gas coke. The burnt lime is drawn out twice a day, and placed in sheds, where it is slaked with a minimum of water. The slaked lime remains for five or six days in layers of considerable depth, after which it is ground and sifted. The grinding appears to be necessary, chiefly owing to a considerable proportion of "core" or underburnt material. From the sieves the lime passes into small sacks, in which it is sent out for use. Nearly all the hydraulic lime used in Paris is thus sent out by the burner as *slaked* lime. The sacks are supplied gratis to the customer—that is, no charge is made for them if they are returned in fair condition when the next load is delivered.

This hydraulic lime, which makes excellent mortar, is usually mixed with three parts, by measure, of sand, though it is a common practice to specify two measures of sand to one of lime. Comparatively, very little lime, however, is used in Paris, owing to the practice of employing plaster of Paris, which still prevails almost universally. The plaster seems to stand fairly well even in exposed situations, in consequence of a considerable admixture of lime, which protects it, to a great extent, from the action of the weather. The mixture of lime and clay obtained from the pugmill is very imperfect, and on crushing up the lumps from the kiln they are found to be full of particles of quicklime, many of them as large as peas. The manufacturers admit the incompleteness of the compound made in the pugmill, but content their customers with the assurance that they must have this or nothing, as they cannot prepare a slip in the winter time.

The summer mode of manufacture is precisely similar to that practised by some of our English Portland cement makers: the chalk and clay are washed together in a mill, which consists of a large wheel rotating in a circular trench. The tire of this wheel is armed with iron spikes, and a considerable quantity of water is used. The chalk and clay are ground under this wheel for from 1½ to 2 hours; at the end of which time the contents of the mill are reduced to a creamy slip, which is run off into settling ponds or backs to dry. The water gradually evaporates or soaks into the ground, and the creamy mixture when sufficiently consolidated to be dug out, which may take several months, is removed in small cakes to the drying-floor, whence in 24 hours it is ready to be burnt.

The hydraulic lime thus prepared is far more perfectly mixed than it could be by simple dry-pugging, and the quality is much superior to that prepared in the manner we first described. During the winter-time a large quantity of clay is carted into caverns or excavations in the galleries of the quarries, and is there mixed by washing with chalk, in order to dry and become ready for summer use. The advantage of making this mixture in the quarry is that the chalk is so absorbent that the water is very freely sucked away from the slip, and the compound becomes sufficiently dry for use with little or no trouble.

The works at Meudon are those originally founded by M. St. Leger, who was the first maker of hydraulic lime in France under the process described by Vicat. M. St. Leger seems to have patented his process in England, but it does not appear that he ever put his plan in operation here.

Near Paris there are now three manufactories of artificial hydraulic lime on this plan. That of M. Deschamps-Hévin, of the Route des Moulineaux, at Issy, is the most important. The price of the ground hydraulic lime is about 24 francs per cubic mètre—say roughly, 15s. per cubic yard.

THE CITY AND GUILDS OF LONDON INSTITUTE.

THE Council intrusted with the promotion of this scheme have just presented their first annual report since the registration of the Institute in July of last year. The principal part of the report discusses the subject of the erection of the Central Institution, the arrangements in connection with which were referred to the sub-committee in December last. At that meeting, Mr. Alfred Waterhouse, A.R.A., received instructions to prepare plans for the new building, and these plans are now submitted to the governors. It will be remembered that a site in Exhibition-road, South Kensington, was granted to the Institute by H.M. Commissioners, and the instructions given to Mr. Waterhouse were framed in accordance with the suggestions contained in the report of the Livery Companies Committee in 1878. These were chiefly that the course of studies to be pursued at the Central Institution should embrace applied physics, applied chemistry, applied mechanics, and applied art. Owing to the necessity of having to make provision for the teaching of these four branches of technical work at the outset, the plans have exceeded the expectation of the Council, and the minimum amount of £50,000 promised to the Commissioners to be expended on the building when a free site was asked for. The Council, recognising the advantage of carrying out the full proportions of the building, instead of sacrificing them to a reduced cost, have decided upon carrying out so much of Mr. Waterhouse's scheme as may be built for the funds at their disposal. The plans have been submitted to the Commissioners for approval, and at a meeting held on the 3rd instant it was resolved that, considering the necessity of proceeding at once with the erection of the Central Institution, so as to keep within the covenants of the lease granted and the importance to the interests of the Institute of so doing, the Council "empower the executive committee to make arrangements for the erection forthwith of so much only of the building, according to Mr. Waterhouse's plans, as can be completed for the sum of £55,000 (the funds available); but that every effort be made to obtain the further funds necessary to enable the entire building to be constructed in accordance with the approved plans." According to the report, the whole ground granted will not be covered at once; but the plans have been prepared so as to admit of the future extensions without altering materially the disposition of the rooms. The report speaks of the importance of making provision for museums, a library of technology, and a large theatre to hold 500 students, for which accommodation could be found in a south wing; but the most indispensable requirements are a sufficient number of lecture, class-rooms, laboratories, and workshops for students in the four branches. Mr. Waterhouse's report, addressed to the executive committee, generally describes his plans. The building will occupy the entire frontage toward Exhibition-road (300ft. in length), and will consist of three parts—the main building, a

north wing, and an engine-house, and row of workshops in the rear. The building will be five stories in height, averaging 15ft. 9in. from floor to floor, except the topmost floor, which will be of varying height, the centre and extreme ends being higher than the rest. The plans show two theatres, large laboratories, about 40 class and lecture-rooms, a council-chamber, reading-room, and refreshment room and offices for the management. Mr. Waterhouse has judiciously set the building back 20ft. from the north and south boundaries, in order to insure light on both sides, and to provide for future wants; a corridor, 10ft. wide, runs through the building from north to south; and another, 7ft. wide, in the return part of the building on the north. The main corridor is lighted by large end windows, and by a range of windows on either side of the main staircase on the ground-floor and upwards. The entrance is central, and the ground-floor level is approached through a large and handsome hall, 37ft. by 33ft. 6in., the groined ceiling of which is supported by four piers. The sketch-plans amended contain accommodation for four classes, as follows:—11,557 super. feet for 9 workshops or class-rooms, 3 sheds and mathematical class-room, for the study of mechanics; 13 class-rooms, containing 9,3.0ft., for physics; 5,011ft. in seven class-rooms for art; and 15,023ft. in 17 laboratories, class-rooms, and workshops, for chemistry. With the additional floor area for the management, theatres, and students' rooms, the total amounts to 57,608 superficial feet. Room will be left on the south-west corner of plot for an additional wing, 78ft. by 66ft. The general disposition of the departments is described in the architect's letter. The workshops are confined to the basement, and three glass-roofed sheds behind the centre of building are devoted to processes that would be unpleasantly conducted within the building. The mechanical section and lecture theatres, &c., occupy the ground-floor; the second-floor is devoted to art and chemistry. The estimated cost of the building, including fittings and professional charges, is £71,000; and there is a deficiency of about £20,000, after making allowance for the amounts promised by the various companies.

The report also refers to the progress made with the Technical College, Finsbury, plans of which have been approved and the builders' tender received. The lowest tender, that of Messrs. Peto Bros., amounts to £20,382, exceeding by £382 the expenditure authorised, and the council have recommended that the tender be accepted with such omissions as shall reduce the cost to £20,000. Mr. Clifton has prepared the plans of the building, which will contain 32 rooms, including a laboratory, two lecture-theatres, &c. It is satisfactory to hear that during the past year 422 students have received instruction in applied physics and chemistry at the temporary class-rooms in Cowper-street schools. The students belong to the artisan class. The overcrowded condition of the studios attached to the South London School of Technical Art have led to plans for additions at the back of one of the houses rented by the Institute, and the report expresses obligation to Mr. Robins for his valuable assistance and promise to undertake the superintendence of the work. Mr. Sparkes has volunteered to direct the classes, assisted by teachers who give instruction in wood-engraving, modelling, painting, and designing. The cost of carrying on the schools is estimated at £900, and the number of students attending the classes is encouraging.

Referring to the technological examinations, the Council express great satisfaction at the results, and the visit made by the director to some of the principal centres in the North of England, show that the evening classes established are exciting an interest in technical education in the manufacturing districts, and stimulating local efforts in erecting laboratories and class-rooms in several towns. We have no space left to refer to the report on examinations given in the appendix, nor the grants given in aid of various institutions, such as University College, King's College, the Horological Institute; for technical education at Nottingham, Lancashire and Cheshire Union, all of which have benefited by the establishment of professorships of mechanical engineering, chemical technology, metallurgy, and classes for other technical handicrafts. The financial position of the Institute shows the total expenses from February till December, 1880, to be £8,906 15s. 9d., and an income of £13,549, leaving a net balance on the year's work of £5,231. It is anticipated the expenses during this year will be in excess of those of last year, owing to the development of the Institute's work; but there is every reason to believe the funds of the Institute will be constantly receiving accessions, such as the annual sum of £2,000, contributed by the Common Council in aid of the work, and the subscriptions of other livery companies who do not now subscribe.

THE NEW INFIRMARY FOR MARYLEBONE.

A LARGE party of members of the Architectural Association visited on Saturday afternoon the infirmary now being erected for the guardians of St. Marylebone, in Rackham-street, Ladbrooke-grove-road. The buildings occupy a site of about five acres, opposite St. Charles' College, and will provide accommodation for 850 sick and infirm pauper patients; they were commenced in May, 1879, and will be ready for occupation in about two months' time. The architects are Messrs. H. Saxon Snell and Son; the contractors Messrs. Warr, Brothers, of Kentish-town; and Mr. J. W. Dorrell has acted throughout as clerk of works. The visitors were received by Mr. H. Saxon Snell, jun., who exhibited the voluminous working drawings in the chapel, afterwards conducting the party over the building, and entertaining them in one of the wards. The plans showed that the site falls rapidly to the north-west, so that the ground-floor of one portion is treated as a basement in another; upon it are placed five long buildings running north and south, connected by a central corridor. The central block is broken by an open court. The portion next the road is pierced by a gateway, and consists of rooms for principal officers, with chapel above; the block to the rear is devoted to administrative purposes, including kitchen, with scullery, bedrooms for nurses, and a water-tower, the laundry forming an annex to the rear. On either side of these central blocks are two blocks of wards, three stories in height, the western portion being intended for male, the eastern for female patients. The buildings, generally, are constructed of stock bricks, with 23in. solid walls, and the whole of the work is of substantial character. The roofs are slated, with tile cresting and terra-cotta terminals. The style is a free and plain treatment of Early Gothic. Variety is given to the outlines of the buildings by angle turrets to wards, and flèche to chapel, and the water-tower rises to a height of 182ft. from basement, and is finished with steep slated roof. On entering by the covered way in the central block, in which is a weigh-bridge and grooved tramway, the officials apartments are seen on either side, and include those for head doctor, matron, under matron, and assistant medical officers. Above these is the chapel, which is 60ft. by 30ft., and 22ft. in height to plate, and another 22ft. to apex of roof. It is seated with pitch-pine benches, and will, it is probable, be chiefly used by the nurses, 58 in number, and from the Nightingale Institution. The internal walls are faced with white Suffolk bricks, with foliage panels and other ornamental details, in Brown's pressed bricks. The string-courses in the chapel and throughout the infirmary are of moulded bricks, by Looker, of Norbiton. No masonry is introduced into the construction of the chapel, the reveals of the lancet-lights being of cut and rubbed bricks, a somewhat costly substitute for Bath stone. The roof is a waggon vault of one span, in three divisions, tied at the collar, and divided longitudinally by exposed principals into six bays. In the centre of the chapel, at the west end, is a large open stove, surrounded by coils of hot-water pipes. Below the roof-plate, and between the windows, panels are left for subsequent decoration in distemper or with illuminated texts, and relief is also afforded by foliage panels of carved brickwork. The glazing is of tinted cathedral glass. Passing across the open court the kitchen was visited; it measures 46ft. by 40ft., and is fitted with an immense close kitchener at one end, and with Benham's cooking apparatus at the other, the side being occupied by dressers, over which are deep shelves. The walls of this room are being lined with glazed tiles, the dado buff and the upper portion white. To the north is the scullery, where the internal walls are faced with white tiles from ceiling to skirting. An annex to north on the higher level forms the laundry, which is fitted with two each of the largest size of Messrs. T. Bradford and Co.'s washing, wringing, and hydro-extractor machines. In the walls of this room are fitted Beart's perforated bricks. A separate building forms the mortuary. It is divided by a wall into two portions, the larger being fitted with slate shelves for the reception of bodies, the smaller with a slate bench and conveniences for *post mortem* examinations. The inner walls throughout are faced with glazed white tiles, and the lighting is by obscured glass. Over the kitchen are two floors of nurses' apartments, each having a separate room. In the centre of the tower, which forms the most prominent feature of the block of buildings, is carried up the kitchen shaft, and around this is a staircase and a series of four tanks, each carried, as a continuous vessel, close to the outer walls upon a strong framework of girders, and together capable of holding a water-supply of 25,000 gallons. From the central courtyard corridors branch off to the two parallel lines of wards on either side. The blocks are planned on each of the three floors as a central day-room, with near it a lift, three separation wards, each of two beds, and two ward scullery. Both north and south of these rooms is a ward arranged for 14 beds on either side between the windows. The floors are of deal, and the walls are coated with Keen's cement, and will hereafter be painted. Mr. Saxon Snell's thermo-hydric stoves are adopted for warming, and for ventilation, sash windows and inlet and exit exit tubes at the floor and ceiling levels are depended upon. In the officers' and nurses' rooms Boyle's ventilators are used. The contract was taken at £109,000, and the work is now rapidly approaching completion. As soon as it is fit for occupation the patients will be transferred from the old Marylebone Workhouse, which is undergoing reconstruction, from the plans of the same architects.

DARKENED CHURCHES — STAINED GLASS.

A SENSIBLE letter on this subject in the last number of the *Guardian* by Mr. Armfield, the York architect, has reminded Mr. John Henry Parker, C.B., of a visit he paid to Hursley some thirty years ago, when John Keble took him into his church and pointed out, with tears in his eyes, the new painted glass in the windows, saying—My friends have been so kind to me that they have filled all my windows with painted glass until I cannot see to read the Service. I used to think that painted glass was something light, ethereal, heavenly; but modern painted glass appears to me to be of the earth earthy, and dark, which I never imagined glass could be made.

"I will not," says Mr. Parker, "be answerable for the exact words, but this is the substance of what he said to me; he had been accustomed in his youth to do duty in Fairford church, where all the windows are filled with Mediæval painted glass, in which the figures are Flemish, but the backgrounds are English, yet you can see to read a Prayer-book of small print in any part of that church; the glass is all of the fifteenth century, and at that time English glass was celebrated for its transparency. In the twelfth century some of the painted glass, as at Canterbury, is very opaque, copied from the glass of the South of France, where it is an object to keep out the light, which is too strong; but it was soon seen that this was not suited for the climate of England. In the fourteenth century this was partially remedied by having only a belt of colour in figures of small size, with the silvery English glass above and below, as in the side-windows of Merton College Chapel. Previously to that, in the thirteenth century, what was commonly called grissaille, or grey glass, was introduced, as in the five fine lancet windows, called "The Sisters," at York. In the fifteenth century large figures were used, but the backgrounds were still of the grissaille glass, with little or no colour. In modern painted glass there is generally a great deal too much colour in the background, which quite kills the principal figure. At the distance of a few yards the eye catches the background only, and loses sight of what ought to be the principal object in the window. The old glass-painters knew how to make use of the lead to bring out the picture.

The figures were not intended to represent life, but painted statues, standing under canopies, and by putting a thick lead at the edge of the canopy they made it appear to stand out over the head of the figure: modern glass-painters make it all flat together. In justice to Messrs. Clayton and Bell I must say that in some of their recent glass, as in Exeter College Chapel, they seem to have returned to the practice of the old glass-painters, and their glass is no longer opaque. I do not believe that the old glass painters ever used what Mr. Armfield calls enamel. Their glass was always pot-metal glass, but with a brown colour in lines upon it; what are called quarries, with which many of our old windows are filled, are only small diamond-shaped panes of silvery glass with a pattern drawn upon them in brown colour; but, of course, all burnt in."

MAKING IRON COLUMNS SECURE.

MANY experiments have been tried with a view to making iron columns fireproof, or at least sufficiently so to be able to stand a small fire in their neighbourhood without bending, and thus bringing the entire building to the ground in ruins, long before it would be destroyed by the fire alone. Casing the columns with concrete, wood, asbestos, brickwork, &c., has been tried. Recently two more suggestions have been made. One is to inclose the columns in rings of terra-cotta, put on over the top when the column is set up. These would act as a shield to keep off the heat till the fire could be subdued. The plan is simple and inexpensive, and has the added advantage of giving opportunity to make the columns highly ornamental, as terra-cotta readily lends itself to decorative treatment. The second plan is to fill the columns with water. To do this the plates or castings, usually placed between the columns where they stand one over the other, have holes or openings of some kind, so that there is a free communication from column to column, from the bottom to the top of the building. Where columns are already erected, short pipes are used to connect them at each floor. The uppermost column is also provided with a small escape-pipe, passing through the roof to the open air. At the base of each tier of columns a pipe is connected with the street mains, so that all the columns may be filled with water, either permanently or on emergency. When thus filled with water and provided with an escape for the expansion of the water or steam, the columns would stand unharmed until every floor was burned out. Were the girders also hollow and filled with water in the same manner, both girders and columns would undoubtedly stand intact, even after all the floors and the roof had fallen in, and they could be used again in rebuilding. The system is patented in the United States, according to the *American Fireman's Journal*.

THE STRENGTH OF WROUGHT-IRON COLUMNS.

THE number and magnitude of the iron bridges and viaducts constructed in America have given the engineers in that country a wider scope for experimental investigations than can be afforded to our own engineers. Thus, according to a paper read by Mr. G. Bouscaren, before the American Society of Civil Engineers, the contracts for several iron-bridges and viaducts for the Cincinnati Southern Railway, those especially over the Ohio, Kentucky and Cumberland rivers, gave opportunity for a number of experiments to be made during the year 1875, for the purpose of testing the respective worth of Gordon's and Rankine's empirical formulæ for the determination of the strength of columns and compression members. It was chiefly in respect of the value of constant f of Gordon's formulæ, or a value supposed to be equal to the ultimate resistance per square inch of a short column whose length is equal to its diameter, that the experiments were specified. Gordon's rule was selected, it appears, and a proviso was made in the specification that experiments should be made to find the value of constant f to be used for each kind of iron and shape of column proposed by the contractors. Tables are given showing the results of these tests, and a description of the apparatus used for measuring the compression is furnished in the paper we refer to. Some of the columns mentioned were of octagonal shape in cross section, in four segments, rivetted through the flanges, or otherwise diametrically between the flanges. Failure generally took place by deflection. The other tables show cross sections of I form, circular or Phœnix columns, square rivetted sections like box girders, and others of latticed posts or open columns composed of two channel bars latticed. From these experiments the author derives certain conclusions which are of sufficient practical value to give here. In the first place as between Gordon's and Rankine's formula, Rankine's is pronounced the more accurate of the two. This is shown, says the author, "by the results of the tests on the Phœnix and closed square posts, where, the parts being thoroughly united together, the large factor due to defective construction and workmanship may be considered eliminated in a great measure." The results tabulated, we find, from the extreme values of constants obtained for Phœnix posts with flat ends, make under Gordon's rule a difference of more than 22 per cent. and under Rankine's less than 17. The extreme values obtained for the square closed posts with flat ends give a still greater difference between the two, or less than four per cent. for Rankine and more than 15 for Gordon's rule. Another conclusion was that "iron of the highest modulus does not necessarily make the strongest column," a fact which seems at variance with the opinion of many engineers. The "greatest value of 'f' obtained for the Phœnix posts corresponded to the smallest modulus," but this must be explained by the quality of the iron used. The importance of bolting securely together the several segments of built columns, so that the parts may act as one continuous column, is insisted upon; lateral flexure, or buckling, being especially guarded against, as well as longitudinal relative motion. In some cases the substitution of close rivetting for cast shoes, bolted on, made a considerable difference in the strength. One other important fact was elicited from the experiments, namely that "the thickness of the metal and the spacing of the rivets be so proportioned that the column shall fail by flexure as a whole, before any local buckling or flexure shall take place." In fact, the experiments seem to have confirmed the rule laid down by Fairbairn, as to the distance between rivets. Leaving the details of the paper, we are prepared to endorse the opinion of the author in thinking that many useful experiments on specific points of wrought-iron columns remain to be tried, such as the effect of the eccentricity of the line of pressure to the axis of column, that of a force acting transversely to the axis, and the effects of the different connecting members on open or latticed supports. Large bridge contractors have, as the author well observes, ample means and facilities for conducting experiments of this kind, and we certainly think one of the most advantageous steps for both engineer and contractor would be the discovery of some means to reduce the "factor of safety" invented to cover, as the writer says, two large fields, the "incidental" and the "unknown," and we might add "imperfect manufacture."

PUBLIC WORKS IN INDIA.*

A LETTER addressed to the Right Hon. W. E. Gladstone, M.P., and other members of the Government, by Mr. Alexander R. Binnie, M.Inst.C.E., lies upon our table, and will be profitably read by those who are endeavouring to promote economy in one of the largest departments of expenditure connected with our Indian Empire. Mr. Binnie, in brief, shows the absurdity of a large department composed chiefly of civil engineers, being governed by a small body of better-paid Royal Engineers. The fact is, the military spirit of the old days is obstructive, coming into unnecessary collision with a rising class of civil engineers who have devoted the best part of their lives to the study of constructions such as Government buildings, roads, &c., and are more competent to carry out such works. The total number of officers, civil and military, in the Public Works Department, is stated to be upwards of 800, and they are assisted by a body of about 600 or 700 subordinates, which is recruited by natives, &c. If, as the author shows, 25 to 30 per cent. are the establishment charges paid by the Government of India for the total engineering services rendered by its Public Works Department, it is high time a reform of this department took place. The engineering staff is redundant. In this country, the civil engineer's charges only amount to about 5 per cent. on the value of the work executed. Mr. Binnie enters somewhat minutely into the reasons which have caused this excessive expenditure for engineering skill. That they are inherent in all public works departments we do not question, but they are well summarised in the following passage:—"The Government of India have been attempting an impossibility—viz., to govern and direct what in the main should be a purely civil department of the most energetic, elastic, and progressive description, by rules founded on and inspired by a spirit of the most rigid military character, and administered by a narrow and exclusive circle of purely military officers, &c." It is shown, also, that the great body of competent men who are civil engineers in India, have been relegated to inferior and subordinate positions. In the case of the Sâgâr barracks failure, the author points out that the inquiry showed the Royal Engineer officer who constructed them had no previous experience of building in stone and mortar. The Allahabad failure also was due to the want of knowing the simplest quality of the lime used, and the officers in charge were dismissed. Then an immense waste of time and energy arises from the friction of departmental work and correspondence. We can merely give the author's general views as to what may be done to remedy the present system. No economy can be effected by employing incompetent or underpaid men whose mistakes lead to immense cost sometimes. Three branches are suggested: the military, civil engineering, and local departments. The military department should be strictly confined to military duties, the civil engineering department for design and construction only should be officered and governed by trained civil engineers of the best class, and a third or local class should be intrusted with repairs, maintenance, and renewal of all civil engineering works already constructed, as well as the construction of all civil buildings, into which class natives may be largely introduced. Mr. Binnie has been for many years actively engaged in the management of public works, and, therefore, we are sure his opinions will be taken for what they are worth. We think he has made out a strong case, and that the Public Works Department in India might be considerably economised and rendered more efficient by the suggestions he has offered.

* London: E. and F. N. Spon, Charing-cross.

THE BRIGHTON CLOCK-TOWER COMPETITION.

WE are rather surprised to find that so many as forty-two designs have been sent in for the proposed clock tower at Brighton—first on account of the insignificant premiums offered, and next, because it was by no means apparent that the proposed structure would ever be erected, or that, if it were, there existed the slightest chance of any but a local man being entrusted with the work.

The works committee this week selected three designs, awarding the premiums in the following order:—1st, £20, to "Passing Away"; 2nd, £15, to "A Shield with a Cross on it"; and 3rd, £10, to "Gravity" (Mr. J. M. MacLaren, of King William-street, London, W.C.); and this selection was confirmed at the meeting of the Town Council yesterday.

"Passing Away" is a good design, but several practical defects are apparent in the arrangements for the clock machinery, and the ventilation and lighting of the urinal. The author sent in two designs, the cost of the one chosen, the best of the two, being £1,000, and that of the alternative one £1,100. The style is French Classic; the whole structure is kept within a reasonable space, and the objectionable urinal is placed underground out of sight. Brickwork and Portland stone are the materials to be used for the lower part, the upper being composed of iron, of a light and durable character.

The second design is the worst of the three. Its cost is greater (£1,295), the urinal is above ground, and the whole structure heavy-looking. The style is a modification of Italian Gothic. The third design is better altogether, and the

ornament of the tower is particularly good. The style is French Classic. On the top is a figure of Mercury. The plan is well arranged. Care seems to have been taken to provide for the clock machinery in every detail, and the urinal is well lighted and ventilated. The estimated cost is within £1,500, the sum named.

Among the other designs "Point within a circle," "Brightelmstone," "Commune Bonum," "Requirement," "Let Brighton Flourish for Ever," and "Experience," are perhaps the best. Most of the others are either indifferent attempts to accomplish the object sought, or extravagant efforts to erect miniature churches, pavilions, and fortresses. One design, "Iron," is entirely of the material indicated by the motto.

"BUILDING NEWS" DESIGNING CLUB.

A Cottage Hospital.

THE plans we have received for this subject, though displaying ingenious arrangements, are not, on the whole, satisfactory, and as it frequently happens, the best plans have the least artistic elevations. We are, therefore, compelled to award the first place to a design in which the two elements have been considered. By a cottage hospital we did not intend a formal kind of edifice, with the wards planned in hospital fashion on either side of a centre administration block, but a homely-looking building, partaking of the appearance of a cottage, and to facilitate the design of such a building we limited the accommodation to eight patients. (1) "Jack" appears to have combined these qualifications in some measure, at least, though we do not accept the plan as either a perfectly contrived or economical one. Its merits are that the wards for male and female patients are conveniently close, with a nurse's room between, so that the same attendant can overlook both wards; the w.c., bath-room, and lavatory to each are well placed at the end, and have cross-ventilation; a convalescent room is provided near the entrance, with a special ward and operating room near the main wards, while the matron's room and apartments, kitchen, &c., are shut off from the hall by an open screen, yet close enough to the wards and entrance for economical superintendence of the hospital. The chief objections to the plan are the want of through ventilation in one of the wards, the position of the beds in the corners, and the location of the infectious ward, which ought to have been isolated or cut off more than it is from the house. The wards are 28ft. 6in. by 15ft., each with Boyle's ventilators in circular turrets over them; the windows have sashes below and casements above. The entrance and side covered way and conveniences have been thought of. Externally, the entrance is made a central feature; there is an open porch with two arches, the matron's bedrooms, partly over the porch, being gabled; the wards are pronounced yet handled in a semi-domestic manner, and the treatment is brick of late 16th century character. (2) "Beta" has fairly disposed his sick-wards on each side of an administration block; they are well ventilated and lighted; a verandah is obtained in front of each ward, in connection with a day-room provided at the end of each for the use of convalescents—a good feature. We don't like the long corridor, and there is a want of compactness and economy in the service. A block in the rear for infectious cases, connected by the corridor, is shown, but is rather too large. The design is cottage-like in the treatment of the wards, but the dormers and details more quaint than suitable. (3) "By Veronese" has been successful in treating the plan with some degree of domestic freedom; the male and female sick-wards, 23ft. by 18ft., are placed at the ends of a right-angle block, each has a large bay-window for the use of patients; the windows are confined to one side; a bath-room and closet are provided to each ward, and the kitchen and offices are handy, but the service from them through the entrance hall to the male ward is objectionable, and making the operating room a prominent feature close to the entrance is also a mistake. There is a want of contrivance in the domestic part. The style, brick and timber, is suitable, but why three little gable windows to the ward? They look extremely paltry. (4) "Tam O'Shanter" we place fourth, because of its very characteristic external design, which is mainly half-timbered. The roofing in one wide span is continued over an outer verandah, which returns at one end, and the entrance to sick-ward and infectious-ward are obtained under it. We hardly see how the hall is to be lighted; the corridors are awkward, and the light and ventilation of the wards, confined to a wide end window in each, are inexcusable faults in the plan, to say nothing of a general want of conception. (5) "Walter" has judiciously-disposed wards; one is 24ft. by 16ft. 6in., but the male ward has its entrance directly opposite the front door; the matron is not central enough to supervise the general arrangements, and the nurse's room and operating room are ill-placed, and too near the entrance, and other details are not well contrived. In the elevations the author has given a rural character to the building, the administration occupying the corner between the two blocks or wards. The treatment is brick, Late English, with Semi-Classic detail. (6) "In Hoc Signo Vinces." In this plan the wards are at right angles, with a nurse's room in the corner, opening into the corridor and into each ward. We object to the front position of the operating room and the straight corridor entrance directly leading to the wards. The general distribution of plan is economical, but the details are not worked out satisfactorily. The means for heating by hot air behind fireplaces, and the ventilation and drainage are specified. A fever-ward is shown at the extreme end of the kitchen building The design, Domestic Gothic, is spoilt by the sprawling relieving arches over the lintels. (7.) "Per" is a symmetric plan on the pavilion system, the wards being connected by corridors with the centre block; the bays to day rooms, are good features; but the entrance and long corridor approaches, and the distance of nurse from wards, would destroy the homely comfort and economical working of the hospital. The high gabled matron's block in the centre, and the clock and chimney-stack rising out of it, have a pretentious look. (8) "Alpha" has a similar distribution, but the connecting corridors give access to an operating-room and accident-ward, with nurses' apartments attached to each ward; the kitchen and matron's room are central, but the position of the former, with respect to the entrance, is not desirable, and the use of front stairs for the infectious cases, provided on the upper floor above the kitchen offices, is open to still greater objection. In elevation the author has adopted a Queen Anne treatment, but too ambitious for a cottage hospital. (9) Less satisfactory as an elevation is "Yarra Yarra." It is, however, more modest, being all on one story; the plan is a balanced arrangement, with the wards arranged as wings. These are 21ft. by 17ft., with through ventilation, and back lobby entrances to airing-grounds, forming isolating chambers to the earth closets. The central block arrangement and its long corridor leading to a detached block for infectious cases, is too formal and workhouse-like. The author provides for heating in the right system by fireplaces with Galton's stoves, &c., details of which are given. (10) "Bonus Hominus." This is rather a good arrangement; the convalescent room and matron's on each side of entrance, and the position of wards right and left, with end verandahs and seats for the use of patients. The infectious ward, is isolated and placed in the rear of female ward. The ventilation is proposed to be secured by Boyle's air-pumps; open fireplaces are shown. The wards, 23ft. 4in. by 15ft. 10in., would have been better separated from the surgery and mortuary, and the offices are not placed in the best positions. The front elevation is suitably treated, but the double gable looks a little out of keeping in character. (11) "Ephraim" is on the semi-detached ward plan, with centre administration offices. The wards, with bayed ends, the conveniences, and the verandah, are good features; but the nurse, as in the last plans, is too far from the wards, and the cooked food would have to traverse two long corridors to the patients. The infectious block is made a distinct wing behind the female ward with its own entrance, but the bath-room is unhappily placed, and the general planning is not conducive to economy of administration; the ventilating provision is by Boyle's, and hit-and-miss inlets at window-sills, with open fireplaces and hot-water coils under windows. The sketch shown is suitable. (12) "Rex" has a pleasing elevation, one story, the wards forming gable ends, with a verandah between their projection, serving as an entrance. The matron, and nurse, kitchen, and surgeon are symmetrically disposed at the four corners of centre block; but the wards show no side-windows, and no closets or bath-room in connection with them, a serious deficiency, which might easily have been added at the sides.

We can only speak in very general terms of the remaining designs, the authors of many show skill in parts, but have mistaken the requirements of a small cottage hospital. "Fidelis" has some merit in the elevations, and its plan a few good points; the wards, with nurse between, are convenient; the conveniences, &c., are well placed, and the matron and kitchen, two indispensable requirements, are in judicious proximity. The side-entrance and the corridor to infectious ward are also fairly planned. "Juvenis" is a plan also showing a proper arrangement of the wards, &c., the matron's apartments; the acute, or infectious, ward, and the proximity of kitchen to the sick-wards have been well considered; but the author has not been happy in connecting the domestic or office part to the wards. More costly in scheme is "Black and White," a long corridor, pavilion plan, defective in working facilities, though showing knowledge of buildings of this class, "Il faut Marcher avant de Courir" has a neat Gothicesque exterior; but the plan is wastefully disposed, and the ventilation imperfect, to say nothing of the distance of kitchen from sick-wards. "Ambition" has the germ of a good plan; the ward blocks, with the convalescent bays at the ends, and the conveniences are well planned, but the scheme is not compact enough. "Pupil J." shows an artistically treated elevation, with verandah for patients, but the lighting and ventilation of wards are imperfect, and the administrative offices hardly well considered. "Hexagon in circle" is a straggling plan, the corridors are long, and the wards are only lighted at the ends. The offices are mixed up in a rather confused manner, and the best part of the design is the external treatment. "Snowflake" is simple in elevation, but the plan is too formal. "Weaver" places his wards behind a long administrative block, but the plan is somewhat incoherent, despite a fairly treated elevation. "Fiat" is too confused; the corridors are wasteful and ill-lighted, and the female ward badly ventilated. "X. L." is sensibly managed as a one-story building, but not worked out satisfactorily in plan. "Arthur" has a balanced arrangement, but not economical. We can only name "That's my Idea" showing a good ward arrangement, but with ill-contrived offices forming a semi-detached block. "Arnold," jumbled in plan with poorly proportioned wards, and a neat elevation in a Gothic timbered style. "Trial" fairly planned in the wards.

The few designs we have received for a verandah leave us a poor selection. "Rex" has, undoubtedly, the most suitable design, and the posts and heads are sensibly treated in pitch pine. "Tam O'Shanter" shows a plain post and bracket treatment: and "Tom Tit" an elaborate Gothicesque design with cut brackets and bull's-eyes in small squares above a transom, rather fidgetty in style. "Ogmore" and "Dum vivo cantabo," also contribute designs; these are both bracketed, but the manner the brackets spring in the former design is somewhat clumsy.

THE LAW OF LIGHT.*

MR. EDWARD STANLEY ROSCOE, barrister-at-law, and the author of "A Digest of Cases relating to Building," which we noticed some time ago in these pages, has brought out another useful compendium for architects, entitled "A Digest of the Law of Light." It must be confessed that until recent decisions, the law of light remained in too uncertain and nebulous a form to allow of a clear exposition of the subject. Mr. Roscoe has done a good service, therefore, in embodying the results of recent decisions, and the author has wisely chosen the form of a digest. The author treats the subject in five chapters, as follows:—The Creation of the Right; the Prevention of the Right; the Abandonment of the Right; the Extent of the Right; and the Vindication of the Right. The rules are succinctly stated first, each being accompanied by an "illustration" drawn from real cases, with notes and references to cases. It is usefully pointed out that the right to light stands upon a different footing entirely to the

* A Digest of the Law of Light. By Edward Stanley Roscoe, Barrister-at-law. London: Reeves and Turner, Chancery-lane.

right to air. For example, the owner of a servient tenement can protect himself against the acquirement of the right to light through a window in the dominant tenement, by erecting an obstruction, but he cannot prevent access of air to a doorway or small aperture without blocking it up entirely. The only imaginable instance of interference with air is when its interception or contamination makes a room injurious to health; but such cases are very rare, as pointed out by Lord Selborne, in the City of London Brewery Co. *v.* Tennant.

We may take an instance from the book to show how the author handles his subject. It is laid down as an axiom, referring to the abandonment of the right to light, that the "demolition of the building or the blocking up of the aperture does not in itself constitute an abandonment, being only strong evidence of the intention of the owner of the dominant tenement." Three illustrations are given: we take the first case of "Stokes v. Singers." "A. is the owner of a house with ancient windows; in 1837 the owner for the time being blocks them up with rubble and plaster. In 1856 B., the adjoining owner, begins to build in such a manner as would, had the windows been open, have obscured the lights. A. then opens his windows, and B. erects a hoarding in front. A. brings an action in respect of his rights, and it is rightly left to the jury to say if there has been an abandonment of his right by A., which they negative." Whether the right is abandoned or not is shown to be simply a question of evidence.

The celebrated decision of Sapling v. Jones is epitomised by the author as follows: "An acquired right to light through particular apertures in the dominant tenement is transferred to apertures in a new building on the site of the original dominant tenement, but the owner thereof must clearly show that the new apertures are in the same place as those which existed in the former building." It is not necessary that new windows should be of the same size as old ones; the area may be enlarged, provided the additional light cannot be obstructed without interfering also with the actual ancient light. The most recent decisions have, we observe, been stated. An appendix of statutes, including the sections of the various Acts bearing upon the subject, is added, and the "forms" given at the end increase the practical value of Mr. Roscoe's little guide, especially those of "Statement of Claim" and "Defence." The table of cases and the general index will be found of great service for the purposes of references, and the matter and typography have been so admirably arranged as to present at a glance the legal ruling in every important case likely to come before the professional architect and surveyor. We consider this little digest a good model of what an architect's legal handbook should be—brief in statement and furnished with references.

DICTIONARY OF ARCHITECTURE AND THE ALLIED ARTS.*

THE second edition of Messrs. Audsley's second volume of their dictionary is to all appearance an earnest of the subsequent volumes of their great undertaking. During the issue of the first parts we expressed our opinion of the merits of the dictionary, as far as we could judge from a very partial view of the work; but now the second volume is bound, carrying us from "Aquila" to "Baptistery," a more satisfactory idea of the aim, scope, and fulfilment of the work is possible. In the preface to the second edition, the authors introduce a very flattering letter, approving of their scheme, from the late M. Viollet-le-Duc, and also in support of bringing together the terms not only of architecture and its allied arts, but those of archæology. The authors say, that as the proper study of architecture, sculpture, painting, and the decorative arts is impossible without the study of archæology, they have "brought abreast of them all those archæological matters which are intimately linked with them." Every architect and student will admit the value of the introduction of terms bearing upon the history of the art, and we see no article admitted in the present volume that could well have been excluded. In the preparation of a dictionary or encyclopedia, it is impossible to satisfy all tastes: some will say that subjects interesting to them have been omitted, or too cursorily treated, while other subjects, in which they feel no interest, have occupied a larger space in the dictionary than they ought to have done. Many practical readers perhaps will be disposed to think that such articles as "Arabesque,', "Atrium," "Aureole and Glory," have received too much notice, and occupy more space than they are entitled to in an architectural dictionary, while other topics, such as "Arch," "Arch Mouldings," and "Auditorium," have not been discussed in the manner they might have been. There may be some ground for these opinions, though it must be borne in mind an exhaustive treatment of all the subjects would have increased the size of the work to an extent that would have placed it out of reach of the larger number of students for whom it is intended. Some terms in a dictionary may usefully be subordinated to others or reduced to definitions, while those subjects which throw important light on any vexed point, or about which ordinary books and treatises give scant information may be more amply treated. As Messrs. Audsley's dictionary is a "popular" one, technical explanations and mathematical theories would have been out of place, and practical terms of architecture and construction have been only incidentally referred to, on this account probably. It would have added greatly to the general value of the work if some of these topics were treated more fully, and a few of the terms in ecclesiology, &c., were cut down; but we must take the work as we find it, and thank the authors for the patience and learning they have brought to bear in its compilation.

One good feature in many of the articles is the free use made of the writings of authorities, and the foot-notes. Thus, in the article "Arabesque," which occupies nine pages, copious quotations are made from Hittorff, describing the rise and progress of Raffaelle's school. A few illustrations would have added to the practical value of this article. Owen Jones's and L. Gruner's works have been laid under contribution in explaining the characteristics of this style of ornamentation, and we cordially endorse the opinion that the term "arabesque" should be confined to the mode of ornamentation introduced by the Arabs; the Renaissance ornament in which every kind of animal and vegetable creation appears being very inappropriately known under the same name. The terms "Arabo-Byzantine," "Arabo-Moresque," "Arabo-Persic," are introduced, as used by Girault de Prangey, in his work on Arab Architecture. Under the term, "Arcade and Arcaded Colonnade," an example of this feature, as used by the Roman and Italian revivalists, would have been acceptable. The word "arch" is treated more historically than constructively, and the illustrations of its use are somewhat meagre. "Archæology" is a term merely defined under this heading, though its various branches and applications are very fully discussed in the dictionary. To the word "Architect" about 30 pp. are devoted; the most useful part is the list of architects who lived before and after Christ; but we are inclined to think the article unnecessarily ong, though filled with many valuable quotations from Viollet-le-Duc, the R.I.B.A. Transactions, and inscriptions. The most copiously illustrated article in the volume is that on "Aureole or Glory," and the information collected on the subject indicates considerable study of the works of Christian archæologists, M. Didron, Ducange, and other sources. The word "Baptistery" is fully discussed, and is well illustrated by several types or plans of early structures. A useful index of words is appended, a very desirable addition even to a dictionary. The work is well printed, and Messrs. Audsley may be congratulated in producing a work of popular reference which must long remain the only general dictionary of the arts allied to architecture extant.

* Popular Dictionary of Architecture and the Allied Arts. By William J. Audsley and George A. Audsley, Fellows R.I.B.A. London: A. Sotheran & Co., Strand and Piccadilly.

At a meeting held at Cannock last week, plans prepared by Mr. Joyce, architect, of Stafford, for the enlargement of the parish-church, were adopted, and it was decided to obtain tenders for the execution of the work. The nave and aisles will be extended eastwards, so as to absorb the present chancel, and a new chancel will be built beyond the present lines, additional accommodation being afforded thereby for 240 persons.

Building Intelligence.

Birmingham.—Plans for new buildings for the Gas department of the Corporation of Birmingham have been prepared by Mr. Yeoville Thomason, architect, of that town. The buildings will form a continuation of the Council-house, covering the remainder of the site bounded by Congreve-street, Edmund-street, and Eden-place. The offices of the Gas department will be on two floors—viz., the ground-floor and the lower ground-floor. The whole of the first floor will be appropriated to the Art Galleries, for which an entrance is provided in Congreve-street, with an entrance-hall, 30ft. by 24ft., and a staircase to the galleries of ample width, terminating on a landing 57ft. by 19ft., from which there are two entrances to the galleries. There are 24 rooms, giving a total area of 17,380 square feet, and wall space of 12,208 superficial feet, with the exception of a gallery set apart for an Industrial Museum. The galleries will be in communication with each other by archway entrances. The external elevations of the building will form generally a continuation of the Council-house, the front to Congreve-street being varied by a portico in two stories the full height of the building, and emphasising the entrance to the Art Galleries. The elevation at its junction with Edmund-street will be terminated by a clock-tower. The elevation to Edmund-street will be in harmony with the other elevations of the Council-house, but in much plainer style. The elevation to Eden-place will be similar to the present, except that the upper windows are omitted, and moulded panels worked instead. The elevation to the courtyard will be of yellow brick and stone, harmonising with, but in advance of, the present design. The ventilation of the departments will be separate and distinct. It is proposed to use the principle invented by Boyle, and successfully employed at the Custom House, London.

Gateshead.—A new co-operative store has just been erected in Jackson-street, Gateshead-on-Tyne. The structure is of three stories, including a large cellar, and is divided into several departments. There is also a large public hall, which it is estimated will hold about 500 people. The front of the buildings is in Jackson-street. It is of Classic design, with a polished stone front and columns and carved caps. At one end in the gablet there is the Borough coat of arms, while in the gablet at the other end is the society's motto, "Beehive Industria." The frontage of the buildings is 72ft. 6in., and the back and front together 168ft. The whole is built of red brick, with stone facings. The ventilation is arranged by Sherrington's patent ventilators, and the foul air will be carried off the whole premises by one of R. Boyle and Son's patent self-acting air-pump ventilators. The contractors are Messrs. Greason and Stockdale, Gateshead. The architect is Mr. E. Jameson, Swinburne-street, Gateshead.

Halifax.—A new higher board school is about to be erected between Prescott-street and Oxford-road, from the plans of Mr. Richard Horsfall, of Halifax. The style is Queen Anne, the windows are two and three light, mullioned and transomed, an arcade running along the principal fronts; the roofs are broken up by two towers and by gabled dormers. The external dimensions art 209ft. by 66ft., the site being very narrow and necessitating unusual planning. The basement is arranged as laboratory, cookery, kitchen, chemical stores, the boys' and girls' covered playgrounds, keeper's residence, and offices. Above this is the ground-floor with a central corridor 204ft. by 10ft. 6in., on either side of which are twelve class-rooms 22ft. by 20ft., and 24ft. 8in. by 22ft., each class-room being provided with a separate cloak-room opening out of it. Lavatories for both sexes and two teachers' sitting-rooms and lavatories are provided. On the first floor is the assembly hall, 109ft. by 32ft., which is lighted by a clerestory, and from which open off on the sides class-rooms, and at either end a retiring-room, 20ft. by 13ft. Separate staircases for boys and girls are provided at either end of the hall. The heating is by low-pressure hot-water apparatus. The design was selected in the recent competition instituted by the Halifax School Board, and the estimated cost of the building, exclu-

sive of playgrounds and boundary walls, is £4,700.

Hornby Castle.—Hornby Castle, the seat of the High Sheriff of Lancashire, has been renovated, and a new wing added by the present owner, under the supervision of Mr. John Jowett, his clerk of the works. The entire building is heated by hot water. The lights of the central hall are of stained glass, and the windows of the front hall, boudoir, and other apartments, are also partially of stained glass, the work of Messrs. Camm Brothers, of Birmingham. The ornamental tiling in the apartments and corridors is contributed by Minton, Hollins and Co., of Stoke-upon-Trent, and by Maw and Co., of Broseley, Staffordshire. The new wing has been built by Messrs. Ives and Son, of Shipley, and this firm has also been entrusted with the erection of the new works on the estate. The plastering has been done by Mr. Benjamin Dixon, of Bradford; the plumber work by Mr. Samuel Rushforth, junr., of Shipley; and the painting by Messrs. Bottomley and Sons, Crosshills.

Ilethlingborough.—The parish-church of this village has been for some time under restoration, and the work is now nearly complete. The present restoration has not embraced its unique tower, but we hope that ere long attention will be paid to it. Some time ago Sir Henry Dryden examined the structure, and was of opinion that the lower stages were being gradually crushed by the weight of the lantern, and that the exterior buttresses did not sufficiently counteract, by their thrust, the danger of a possible ultimate collapse. The church itself, which consists on plan of nave, north and south aisles, and corresponding transepts, has been carefully restored throughout. The roofs are almost altogether new; that over the chancel is entirely of oak, an exact reproduction of the original one; the other roofs—save in their huge tie-beams, which are of oak—are of deal. The carved work throughout the church is by Mr. Harry Hems, of Exeter; and the contract, now drawing to a close, has been carried out by Mr. W. H. Henson, builder, of Finedon, near Wellingborough, from the designs, and under the immediate direction of the architect, Mr. Joseph Peacock, F.R.I.B.A., 15, Bloomsbury-square, W.C., London.

ARCHÆOLOGICAL.

The Pagan Idol of Ballachulish.—At the meeting of the Society of Antiquaries of Scotland, on Monday, a notice was read by Sir Robert Christison, Bart., of an ancient wooden image found in November last in a peat moss at Ballachulish, Glencoe. When found the image was prostrate on its face on the hard subsoil underneath the moss, which at present is 4ft. 3in. deep, but within the last thirty years a depth of 6ft. of fine old peat had been cut from it. The figure is that of a nude female, as rudely modelled as it is almost possible to conceive, but at the same time presenting a distinctly recognisable imitation of the human form. The figure is hewn out of a block of solid oak, and is 4ft. 9in. high. The head has a rounded protuberance, which has been suggested to be the hair gathered into a top-knot, the face is somewhat flattened, the nose partly obliterated, and the eyes made by the insertion of quartz pebbles to represent the eye-balls. The arms are represented by rude carving in relief on the sides, and the hands are indicated in a similar manner. The legs terminate without feet in the lower portion of the block, which is merely rudely squared, and serves as a kind of pedestal to the figure. The condition of the wood is in every respect that of oak which has been naturally embedded in moss. Nothing akin to this remarkable image has hitherto been known either in Scotland or Ireland. A group of male figures, eight in number, all standing on a single log of slightly curved form, were found in 1836 at Holderness, and four of them are now preserved in the Hull Museum. They are much smaller than the Ballachulish image, but they are remarkable because they are of similarly exaggerated character, and have also the eyes formed by the insertion of quartz pebbles. They seem to have been fixed by the feet into holes in the log placed as closely together as they could stand. Each figure had a club and two shields, according to one account of them; but the photograph shows only one shield, as they exist at present. Sir Robert also exhibited drawings received from Mr. Worsaae of two wooden images of somewhat similar character. One, which is of oak, and about three feet in length, was found in a peat bog near Viborg, in Jutland. Another, also of oak, and five feet in length, was found in a peat bog in Mark Brandenburg, and is now in the Berlin Museum. It represents a male figure rudely cut out of the solid, with a long rounded body and short legs, the arms merely indicated, the face fairly well formed, and the eyes bearing traces of being inlaid. After comparing these with the Ballachulish specimen, he said the most likely conclusion was that arrived at by the Rev. Mr. Stewart, viz., that it was of Scandinavian origin and of their Pagan time, and, therefore, probably a thousand years old. General Furlong stated that he considered the image Pagan and connected with nature-worship.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Liverpool Architectural Society. — The sixth ordinary meeting of this society was held on the evening of the 9th inst., at the Royal Institution, Colquitt-street, the President, Charles Aldridge, F.R.I.B.A., in the chair. The drawings submitted by the class of design and construction, for "A public-refuge, lamps, and drinking-fountain, to be erected on the open space above the Georges Landing-stage," were exhibited on the walls. After the routine business had been transacted, the paper for the evening, entitled, "Impressions and Recollections of North Wales," by Mr. Samuel Huggins, was read by Mr. J. M. Hay, in the unavoidable absence of the author. A discussion followed, in which several gentlemen took part, and the meeting terminated with the usual vote of thanks to the author of the paper, and to Mr. Hay.

COMPETITIONS.

Newbury.—Nearly thirty sets of plans for the drainage of the borough having been received, the Corporation have appointed Messrs. Law and Chatterton, of Queen Anne's-gate, Westminster, to advise them in awarding the premiums of £100 and £50 respectively for the two best plans. The plans have been open for inspection at the Town Hall on Monday, Tuesday, Wednesday, and Thursday in this week.

Radcliffe.—The Wesleyans of Radcliffe are about to erect a handsome chapel to accommodate 850 persons. The commission has been entrusted to Mr. A. W. Smith, of 42, Market-street, Manchester, whose design has been selected in competition with Mr. Woodhouse, of Bolton, and Messrs. Maxwell and Tuke, of Bury.

Blackfriars Bridge. — A rather important competition among sculptors for the groups to be erected on Blackfriars Bridge is about to take place. The designs for the first group, of which the subject is Cromwell, will be sent in on Monday next, and from what we have seen of some of the models, the competition bids fair to be worthy of the occasion. We trust a competent judge will be engaged to assist in making the award.

CHIPS.

The death is announced of Mr. W. J. Bernhard Smith, an antiquary of the best type, who thoroughly understood the subjects—swords and weapons of war and of the chase, and armour—which he had made peculiarly his own.

The New Skeldergate Bridge at York was opened on Thusday in last week. It has been built at a cost of about £60,000, from the designs of Mr. Geo. Gordon Page, M.I.C.E., of London. The original design was illustrated in the Building News for May 24, 1878, by a perspective and detailed drawings, and the amended design as now carried out by a perspective, on June 25, 1880.

By a fire which occurred on Tuesday morning the workshops in the occupation of Messrs. Devereux, in Church-street, Stoke Newington, were partially destroyed.

Additional schools are about to be built at Branstone for the Burton-on-Trent united district school board, from the plans and specifications of Messrs. Giles and Brookhouse, of Derby.

At a meeting of parishioners of Hove, next Brighton, held on Monday, it was determined to take steps for building a church in the north-west district of the parish.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

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"BUILDING NEWS" DESIGNING CLUB.

E. A. Flower, Merit, and Others. (The scale for the cricket pavilion, of course, should have read one-sixth of an inch to the foot.)—Il faut Marcher avant de Courir.—Engineer. (You are eligible as a competitor. You did not send your name, so we cannot send you the rules asked for.)—Geo. D. Irwin. (Your suggestion is a good one, but our space is so limited we cannot entertain it.)

Correspondence.

THE INSTITUTE PRIZES—A DISTINCTION AND A DIFFERENCE.

To the Editor of the Building News.

Sir,—Mr. Charles Barry may be pitied for the fit of indigestion which he suffered at the Institute on Monday last, in consequence of the tiny gnat I attempted to make him swallow, after the whole convoys of camels that he gulped at the Glasgow and Westminster competitions, apparently with no bad results to himself.

Mr. Lansdell, by the judgment of the committee of selection and the meeting generally, sent by far the best design for the Soane medal competition.

His perspective was discovered by the Council to be a few inches less than the prescribed size (not larger), to his own obvious disadvantage. On such ground, forcibly urged by Mr. Barry, he was disqualified, and all I could obtain for him was a certificate of merit. Immediately after, by favour of Mr. Barry and others' support, a second prize was granted to a design sent for the Tite prize, which had ignored a vital condition as to plan, although it was admitted that several other admirable designs had been submitted to which no technical objections were raised. This decision was virtually condemned by the meeting, and carried only

by the President's vote, which was needed to back those of all the Council present to obtain a majority. Did Mr. Barry forget that he, as umpire in the Westminster Vestry Hall competition, had suffered a design with an elevation double the prescribed scale—a design since found hoplessly impracticable—to take the first premium?—I am, &c.,

John P. Seddon.

1, Queen Anne's-gate, March 16.

RE BOARD SCHOOL, ORPINGTON COMPETITION.

Sir,—My experience in above may interest, and at the same time answer the queries of your two last correspondents Not having heard result after the lapse of five weeks, I wrote to the clerk of the board on the 24th January, asking if matter was settled, and who was successful, when I received a reply "that the board had *practically decided,* and my drawings would be returned in a few days."

After patiently waiting again for five weeks, I troubled the clerk with another note, when he wrote me that "Mr. John Ladds, of Chapel-street, was the successful competitor; he thought my drawings had been returned, but would inquire into the delay."

I do not doubt the fairness of the decision, as (I speak from experience) Mr. Ladd's school-drawings would always take a high place—but a fortnight more having now passed, I think it is something new for an unsuccessful competitor's drawings to be detained for seven weeks after the *practical decision* of the matter. Where are they all this time? and why have they been detained? are fair questions for Mr. Mullen to answer on their return, I think.—Inclosing my card, I am, &c.,

A.R.I.B.A.

"JERRY BUILDINGS."

Sir,—Mr. J. B. Burton, in your issue of the 25th February, charges you, and other professional journals, with publishing "a very great deal of nonsense" in reference to jerry building, and in a somewhat unsatisfactory manner, I think, advocates the cause of the builder. Your correspondent is apparently familiar with building, for his details are calculated to lead to the impression that he knows what is the right thing to be done if the right buyer is forthcoming. I think, however, Mr. Burton does not fully appreciate the question of "jerry building," as it is usually applied to a style of dwellings *run* up in the suburbs of London, and, perhaps, a few other populous cities in England. It is the uncontrolled doings of unprincipled land and house speculators who, in their anxiety to become rich, daringly erect in all directions houses unfit for human use.

It is not a question of buyer, but simply one of tenant, for the mass of London's suburban population are not in a position to become their own landlord. Houses they must have for themselves and their families, and it is for their protection that those writers who decry the jerry system busy themselves in pointing out the iniquities practised by the so-called builders of such questionable structures. There is no waiting on buyers, for long before even tenants are forthcoming, acres of land are covered with houses which, from an honest builder's point of view, are simply abominable. The whole affair springs from an unholy compact entered into between ground-landlord, leaseholder, lawyers, land agents, and a class of men good enough to be in a *ring* so welded, facetiously called builders. The ricketty building so produced, very often stands upon a bit of ground charged with a rent, ample, in many cases, to pay a fair interest on the outlay for a good house.

We can expect nothing else from such surroundings but houses by the thousand, which are simply unfit for human habitation. If your correspondent wishes to protect the perpetrators of such doings, I do not envy him his self-imposed advocacy; but I presume, from his Northern experience, he can form but a faint idea of the state of things around and in London which induces your contributor to send you "a very great deal of nonsense."

Those who can order and enter into the proper arrangements for building their own houses do not always, however, get that which they bargain for, as the numerous conflicts in our law-courts testify. For them, however, we need not feel any more compassion than we would for a man who paid for a piece of genuine broadcloth and received shoddy goods instead. But those who have neither the means nor time to select the machinery to secure a good habitation are entitled to the protection of the Press to ventilate a subject fraught with so much evil. The grocer, milkman, and other tradesmen are liable to punishment who sell fraudulently, and why should not the manufacturers and dealers who supply the "jerry" builder with improper materials be likewise subject to legal supervision and control? The difficulty surrounding the question is the want of a fair and reasonable standard, whereby bricks, mortar, timber, and slates may be properly assessed or tested, for I fear that many of the houses built to order contain material just as bad as the jerry houses, although raised under the supervision and guidance of *competent* men.—I am, &c.,

11th March. Henry Reid.

STRATFORD-ON-AVON CEMETERY COMPETITION.

Sir,—Having been one of the unsuccessful competitors in this competition, I can fully coincide with "£1,300," if the facts stated in his letter are correct, as regards the premiated design.

We were restricted to £1,300 to build a chapel, with mortuary attached, a custodian's lodge, and entrance-gates, with 200 feet of boundary walling, and I am quite sure that only a moderate design could be carried out for the sum, as specified in the conditions of the competition, and I, like "£1,300," think it most unfair that those who took the trouble to keep their designs within the limits of the amount specified, should be overthrown by those whose designs would cost perhaps double.

I am pleased to hear that the committee have refused the premium to the authors of the deceptive designs, and should be glad to see a more deserving competitor carry off the award. I should be gratified if the original competitors' drawings were returned to the committee, and a £1,300 design selected.—I am, &c.,

A Competitor.

Sir,—I notice in this week's issue of the Building News a letter signed "£1,300," with regard to the above competition.

By the advertisement inviting the competition, one premium only was announced to be given, but I presume your correspondent is correct in his assertion that second and third premiums have been awarded; certainly very liberal on the part of the Corporation, and a policy tending, no doubt, to keep the recipients—their fellow-townsmen—"sweet."

When competitors scrupulously prepare their plans to keep within stipulated amounts, it is most unjust that such plans should be set aside for a showy set of drawings which cannot be carried out within the limits; and it must be plain to the dullest comprehension that to build a chapel, mortuary, and lodge, &c., &c., for £1,300, cannot leave much margin for elaboration of detail.

I should be glad to co-operate with "£1,300," to see if some fairer arrangement could not be arrived at, by which men who work honestly should have a chance of success.—I am, &c.,

March 14. Another Competitor.

"VICTOR EMMANUEL MEMORIAL."

Sir,—There are, I find, not a few British architects who are about to become "concurrents" in the above affair. For their benefit, let me give them a hint at starting.

In the notification appearing in so many papers, the impression is conveyed that the whole scheme, even to the town and locality, is to be left to the discretion of the parties, but I find in the "programm," issued from the Italian Consulate, that the structure is to be in "Rome."

This being the case, it will be found that when the designs are adjudicated on, the precise locality will have to be a factor for consideration, notwithstanding anything hinted to the contrary in the "programm."

To anyone who knows modern Rome, it will be apparent that to design a structure of the size and proportions required in this case, without considering where it is to be put, would be as absurd as to contemplate the erection of a palace like Muswell-hill or Crystal Palace in the E.C. district, before taking into consideration the exact site it is to occupy.—I am, &c.,

March 11. B.

FROZEN PIPES.

Sir,—Your correspondent, T. E. Julian, proposes a remedy to prevent water-pipes bursting, and he bases his calculations on the false impression that water in freezing increases in bulk about 12 in 10,000.

Water, as we all know, reaches its point of greatest density at 4° Centigrade, and until it reaches that point, obeys the usual law of expansion and contraction by contracting under reduced temperature:—At 4° water commences to expand until freezing point is reached to about 1 + ·00012, but on solidifying, after passing the freezing-point of 0° Centigrade, the bulk is increased from 1 to 1·098, an increase of nearly 1-10th of its original bulk.

When we see, therefore, vertical as well as horizontal pipes burst almost along their whole length, we very much fear that one of the principal difficulties will be to find the "part affected," so ingenuously pointed out by your correspondent.—I am, &c, G. J. B.

CHEAP CHURCHES.

Sir,—Is it possible that the illustrations to Mr. White's paper in your last issue are intended as examples to follow? They are, in my opinion, just what should be avoided, being the reverse of what is beautiful, and certainly of what is cheap. The construction is not good, the material far in excess of what is needed, and the use of iron altogether objectionable. The arch, too, of the window-head, shown in detail, is not consistent with cheapness or common-sense, the mode of jointing, save from centres of arch, being a silly vagary, increasing cost without any advantage. The arch, to be cheap and good, should be of three half-brick rims, no cutting or rubbing being required —I am, &c. M.

LANCASTER ASYLUM—A CORRECTION.

Sir,—In the first issue of your journal for this year I observe a report on buildings in progress. In this report you say that the Lancaster Asylum is being built from the designs of Mr. Grayson. Allow me to inform you that I am the architect, and it is from my designs that the large annexe at the Lancaster Asylum is now being carried out.—I am, &c.,

Lancaster, March 10th. A. W. Kershaw.

WHY IS NOT LITTLE QUEEN-STREET WIDENED?

Sir,—We will begin by saying that we have not the smallest pecuniary interest at stake in this matter, our object being to obtain more light on a subject of vital public importance, considering the accidents which are daily occurring.

A largely-signed memorial was presented by a deputation of ratepayers to the Metropolitan Board of Works on the 25th ult., and Mr. Newton Wilson, in an able speech on their behalf, said, "that the prayer of the memorial was not a new one, the improvement having been asked for some time ago. There was, however, a daily-increasing necessity for carrying out the improvement, inasmuch as scarcely a day passed without the occurrence of some accident, owing to the narrowness of the street. He would only refer to two accidents that had occurred during the last few weeks, Vice-Chancellor Bacon having been a victim on the 11th inst., and Mr. Justice Groves only a fortnight before. These were only well known instances of accidents that were constantly occurring. Last week three accidents had occurred. The policemen whose duty it was to prevent if possible any blocks in the traffic, found it impossible to do so. The improvement prayed for was not merely a local but a metropolitan one, inasmuch as this narrow street was an important connecting link, not only between the East of London and the extreme West, but also between North and South. The particular part of the street which required to be improved was only 145ft. in length, and was located at the northern extremity. It was occupied by property of a very secondary character, and was, in fact, in such a state that it had been condemned." They wished particularly to call the attention of the board to this fact, as the present time presented a very favourable opportunity for making the improvement desired at a minimum of cost. If there were any delay in the matter, the improvement would cost very much more than it would now. In conclusion, Mr. Wilson said the question was not unworthy the notice of a board which had already earned the gratitude of the metropolis by the many vast public improvements which it had carried through. The Metropolitan Board of Works said they had no power to take work into their own hands, but have offered to contribute one-half the net cost towards improvements, if effected by Local Board of Works, for St. Giles's, and to lend them £10,000 more at 4 per cent., repayable in fifteen years.

A deputation waited on the Local Board on the 8th inst., and strongly urged them to accept terms offered by the Metropolitan Board, and the matter

will be discussed at the Local Board meeting on Tuesday next. "Why, of course they will gladly accept them," your uninitiated readers will exclaim. We venture to prophesy, however, that unless much public pressure be brought to bear, the offer will be hushed up, and rejected on the plea of expense to ratepayers. "Why?" the above-mentioned readers will ask.

If some independent member of the Local Board will give us truthful answers to the following questions, the public will be able to judge for themselves why the improvement is in danger of not being carried out:—

1. Are any members of the Local Board in favour of an alternative scheme for forming a new street from the corner of Great and Little Queen-streets into Holborn near the Royal Music Hall?

2. Would not this scheme involve the demolition of several almost new warehouses, and other very valuable property?

3. Are any members of the Local Board owners or leaseholders of property so affected, and if so, to what extent?

4. The estimate cost for widening old street, and also for making the new one.

5. The arguments (if any) which can be advanced in support of the great expense of new street in lieu of widening the old one at a comparatively small cost.—We are, &c.,

ARCHITECTS AND SURVEYORS.

EXTERNAL SOIL-PIPES.

SIR,—It is not I that am hasty or inconsistent. If your correspondent can see no difference as to what I said between accretions caused by splashing and actual deposit, in an ill-constructed pipe or drain, further words are wasted.

If it be the fact that pure air passing through a pipe at an increased rate of two thousand per cent. should render the emanations more foul, either in quantity or quality, than would be the case with a state of semi-stagnation and gentle evaporation, some of us certainly are in need of instruction.

Danger from leakage is quite outside the question raised, and it may be met by isolation.—I am, &c. WILLIAM WHITE, F.S.A.

THE FABRIC OF THE CHURCH.

SIR,—Owing to absence from town, the proof you were obliging enough to send, reached me too late for correction. The MS. from which I read the paper being rather rough (caused by there being no time to get it fair copied), has resulted in some obvious, though not serious, misprints, which I need not now particularise. Allow me, however, to express my regret that, in alluding to All Saints' Church, Harlesden, I omitted to mention the fact of the nave-roof being eventually intended to be vaulted in wood, which a little qualifies my argument.—I am, &c., EDMUND B FERREY,

15, Spring-gardens, S.W., March 16.

CHIPS.

Mr. Charles Pugh, late sanitary inspector to the Mortimer rural sanitary authority, Berks, has been elected to a similar office under the Guildford rural authority, from amongst 60 applicants.

A meeting was held at the Queen's Institute, Dublin, on Tuesday afternoon, for the purpose of forming a ladies' sanitary association for Dublin, and addresses having been delivered by medical men and engineers, it was decided to start such an organisation.

The town-council of Yarmouth are about to make a further experiment in the use of iron pilings for the repair and protection of the quay-walls. A committee have reported that a short length of iron piling had lasted three times as long as the adjacent wood piles, and was not only impermeable to worms, but it was impossible to shorten iron piles by cutting them, as was alleged to be done with wood, and so they had to be driven the full length. Tenders were opened for the supply of sufficient to protect a further length of 300ft., and that of Messrs. Williams and Co., of London, the contractors for the iron already used, was accepted at £7 10s. per ton.

The Town Council of Wolverhampton on Monday voted an increase of salary, from £120 to £140, to Mr. Blanton, sanitary inspector for the borough.

The railway station at Wellington, Salop, is undergoing rebuilding, and the new offices are now being occupied. The facings of the building are of 3in. red bricks, from the works of Mr. Edwards, of Ruabon, with Yorkshire freestone dressings; the internal woodwork is chiefly of stained pine. A new covered-in platform, with asphalte paving, and 300 yards long, has been provided. The contractors for the station are Messrs. Horsman and Co., of Wolverhampton.

Intercommunication.

QUESTIONS.

[6430.]—**Action of Frost on Mortar.**—Should frost penetrate the mortar of a building, causing it to shell or fall off the face, will the mortar set again in the wall?—W. L. B. SKIPTON.

[6431.]—**Gas-Tar Varnish.**—There is some method of making ordinary gas tar into a firm, hard, black varnish, other than by distillation, I believe, by mixing acids with it. Can any correspondent say how it is done?—P. T.

[6432.]—**Stain for Stonework.**—I want to stain a small portion of stonework to match the red-brick facing in front of house. Can any of your readers kindly inform me what is the best thing to use as a permanent stain to stand the weather?—STONE STAIN.

[6433.] — **Levelling — Reservoirs.** — Could "G. H. G.," or any other reader of the BUILDING NEWS, tell me of an inexpensive book on Levelling as applied to architecture, price, name of publisher, &c.? Have looked in various catalogues, but cannot find one. Also a cheap book on Reservoirs, &c.?—KOEPENICK.

[6434.]—**Baker's Oven.**—Would "G. H. G." or some other enlightened reader kindly inform me the best way of describing the necessary work to be done and provisions to be made in a specification for a baker's oven, furnace, &c., which I am building in connection with a baker's shop?—NODLEF.

[6435.]—**First Commissioner of Works Office.**—Will any of your readers be kind enough to inform me if there is an architects' office in connection with the Government Commissioner of Works Office, and if candidates for admission are required to pass any examination?—F.

[6436.]—**Fence to Highway.**—Will any reader kindly assist me in the following:—A. owns land abutting on the highway, separated therefrom by a quickset fence growing on a "cop" or mound 2ft. high, the foot or base of which "cop" is 2ft. from the centre of the hedge-row or quicks. There is no ditch on either side. A. wishes to displace the hedge by a stone wall, and claims the foot of the "cop" as his boundary. I contend that the land to the centre of quicksets belongs to the highway. Who is right?—SURVEYOR.

[6437.]—**Mastic Cement.**—A great deal has been said and written of late in the columns of your highly-prized and valuable journal on the antiquities and qualities, &c., of Portland cement. If any of those correspondents who gave such valuable information about the Portland cement gave some information in a similar way on the origin and properties of mastic cement, together with its proper mode of use, I thing it would interest many of the numerous readers of the BUILDING NEWS.—PRO BONO PUBLICO.

[6438.]—**Architects' Drawings.**—Will some of your readers satisfy me on the following point:—After I have completed the works my client wants the drawings, &c. In consideration of our having a good deal to do with each other in business matters, I had considerably reduced my ordinary charge (the usual commission), and there was also a verbal understanding that the plans remained my property. Can my client now claim the drawings, &c., seeing that I have not charged full commission? Does the difference in the rate of commission charged affect the property of the drawings in question?—DOUBTFUL.

[6439.]—**Damp Walls.**—Will any experienced architect or builder inform the writer the best external application to apply to brick walls to keep out damp? The case required is this: Some gables to a large house are reduced to one brick, or 9in. in thickness, coped with terra-cotta. The gables are lofty, and in a very exposed situation. The recent heavy rains, with beating winds, has driven the wet through the walls, and the house being entirely of brick and stone dressings, does not admit of cement being used. The writer would be grateful to know what external application, so soon as the walls are dry, would be suitable, and have the effect of keeping them dry.—SICCUS.

[6440.]—**Hatch.**—Will some one kindly inform me what is the best method of fitting up a hatch between dining-room and serving-lobby of a good house? Also whether there is any method of hanging sliding sashes without weight and cords?—ENQUIRER.

REPLIES.

[6428.]—**Oak Fittings.**—"B." should have used Riga wainscot oak, such as is supplied by Messrs. Oliver and Sons, the well-known timber merchants, of Bunhill-row, E.C., and many other high-class people in the same business. Riga would have cost him double as much as the English, but the expense in labour is somewhat less, and the ultimate result would have been a clean, satisfactory job, such as one can seldom get where the general run of English stuff is used. Of course, when English oak is bought of men like Mr. F. Whitlock, of Woburn, Bedfordshire, one gets it exceptionally good, for in Northamptonshire and neighbouring counties, as well as in Hampshire, the English oak flourishes well. Such oak works up beautifully, and if "B." had used it for the bank fittings referred to he would, no doubt, have had reason to be proud of them. Oak varies very much in price, but for high-class work the dearest is probably much the cheapest in the end. During the present week I have had a good deal of oak in, and I find whilst I have bought a couple of trucks of excellent, sound, and dry English planks at 2s. 2d. the foot cube, I have paid for some American (in bulk), 3s., delivered, and have bought other seasoned English at 6s. Further, within the last few days I have purchased dry foreign wainscot from three different timber merchants at the respective rates of 6s. 6d., 9s., and 11s. a foot cube. I merely quote these prices passingly to illustrate that there is oak and oak, and to show that although within the last few days I have bought stuff at prices varying from less than 2½d. the inch up to 11d., that, nevertheless, I should very much hesitate before I defined any one a greater bargain than the other. The fact is, there is good sound stuff one would use out of doors or up in roofs away from the eye, that a judicious man would never dream of putting directly under the eye. It is entirely a matter of judgment. "B." asks what cabinetmakers generally use. I do not know what oak they have a preference as a rule for, but I do know what they have a great weakness for, and that is sandpaper. When once sandpaper touches oak, be it English or foreign, it is ruined for ever. Oak must, under all circumstances, be left from the tool. In my shops the use of sandpaper is only permitted in one place, and that is in the W.C.—HARRY HEMS.

[6428.]—**Oak Fittings.**—The best kind of oak to use for internal fittings, such as dadoes, counters, desks, &c., is Riga or Memel wainscot. It is, with few exceptions, always used for such purposes by builders and cabinet makers. It stands much better than English oak, and is as a rule, nicer-figured wood, though English oak butts, when quartered, and cut into boards or planks, ought to contain some very prettily-figured wood, scarcely inferior to wainscot oak. It may not be out of place to say that oak should have time to season, two to four years, according to the thickness of the boards.—BUILDER, Leeds.

PARLIAMENTARY NOTES.

SUPPLY.—The following supplementary estimates for the Civil Service and Revenue Departments, for 1880-81, were voted on Monday:—£2,192 for the maintenance and repair of public buildings in Great Britain and the Isle of Man, £3,000 for the survey of the United Kingdom, including the revision of the survey of Ireland; £5,087 for new buildings connected with the Science and Art Department, £800 for the British Museum buildings, £1,838 for diplomatic and consular buildings, and £260 for the Treasury.

HIGHWAYS.—Mr. Magniac on Tuesday asked the President of the Local Government Board whether, considering that general discontent prevailed with regard to the present Law of Highways, and that in the last Session Her Majesty's Government would not agree to the appointment of a select committee of that House, they would take active steps to procure information on that subject. Mr. Dodson said that the reason why a select committee of the House of Commons was not appointed last year was that a committee of the House of Lords was sitting on the subject. He saw no reason to doubt that the information then obtained, together with that already in the possession of the Local Government Board, would be sufficient to enable him to deal with the subject. He could not altogether agree with his hon. friend that in the present state of the law it was impossible to arrive at a just and equal valuation of property for rating purposes; but he admitted that there were difficulties in the way of so doing, and that it was desirable that the law should be amended.

BRITISH POTTERY.—Mr. Gray on Tuesday asked the Vice-President of the Council why the prices of modern British pottery at present exhibited in the Bethnal-green Museum had been carefully erased from the labels affixed to them, while the prices of modern foreign pottery had been allowed to remain, and if he would state the date of the order of the Committee of Council on Education sanctioning such erasures. Mr. Mundella: The minute sanctioning the withdrawal of the prices upon modern examples of British pottery and porcelain at present exhibited at Bethnal-green Branch Museum is dated March 23, 1865, at the time when Lord Aberdare was Vice-President of the Committee of Council and Sir Henry Cole was director of the museum. These examples were, for the most part, purchased at international exhibitions at greatly reduced prices, and, at the special representation of English manufacturers concerned, the prices were expunged from the labels, complaints being made that museum prices were quoted to the trade by customers at a much lower rate than the goods could be supplied at. The examples of foreign manufacturers having been acquired at the usual prices, the labels were maintained, showing the cost.

LEGAL INTELLIGENCE.

JERRY BUILDING AT SUTTON, SURREY.—At the Epsom Petty Sessions on Monday, W. Tester, builder, of Sutton, was summoned for having erected eight new buildings at Sutton, the materials used not being in accordance with the requirements of the Sutton parochial committee. Mr. W. O. Reader, on behalf of the Epsom rural sanitary authority, stated that defendant had purchased some land in Balham-lane, Sutton, and in September last plans were laid before the Sutton parochial committee and approved by them subject to the work being done in a proper manner and with proper materials. From the very first the materials and the workmanship had alike been bad, and the surveyor had had great trouble in the matter. He had insisted on certain portions being pulled down and reconstructed, but the materials used quickly degenerated again, and the work was very badly done indeed. Instead of mortar, garden-mould, mixed with the smallest quantity of lime, was used, and this possessed no cohesive properties. Four houses

were built and covered in, and four more were half-up. They would not be fit for people to live in. Mr. Appleton, surveyor to the Epsom rural authority, gave similar evidence, saying that several of the walls were out of plumb by 3in. or 4in., and quite unsafe. If a brick were taken away the "mortar" fell away from it at once. If the walls of the four partly-built houses were not pulled down they would soon fall down, and portions of the completed building would have to be demolished. The witness produced samples of the "mortar," which the magistrates crumbled to dust in their fingers. Mr. H. Keele, builder, of Sutton, corroborated, stating that the stuff put in as mortar was laid almost as thick as the bricks, and they were simply mud houses. There were now seven props to hold the walls up, and not one of these walls was straight. Defendant did not deny that the work was badly done, and explained that he had placed the work in the hands of his son, who was over 30 years of age, and had given directions for everything to be done in a proper manner. Money was found for the work, but his son had applied it to other purposes. The magistrates adjourned the case for 14 days, in order that they might inspect the houses in company with Mr. Appleton and the defendant.

Stained Glass Competitions.—Dixon v. Corpus Christi College, Cambridge.—In this case, tried on Tuesday, at Nisi Prius, before Mr. Justice Lopes and a Common Jury, the plaintiff was a designer and manufacturer of stained-glass windows, and the defendants the Master and Fellows of Corpus Christi College, Cambridge. In the month of May, 1879, the defendants were desirous of erecting a stained-glass window in the college chapel. The plaintiff and others were invited to send in designs on the understanding that the artist whose design was selected should have the execution of the work intrusted to him. The plaintiff accordingly sent in a design, and another was furnished by Messrs. Heaton, Butler, and Bayne. After an interval the plaintiff was informed that his design had been rejected, and would be returned to him by train. In the course of time a package was delivered at his place of business containing a design which was certainly not the one with which he had furnished the defendants. The plaintiff, therefore, went to Cambridge and saw the Dean of the college, who offered to show him the selected design. This was no other than the plaintiff's own design, and regret was expressed on the part of the defendants at the mistake which had arisen. They nevertheless employed Messrs. Heaton, Butler, and Bayne to execute the window, and the plaintiff brought the present action to recover damages for the loss of contract. Mr. Bulwer said he was happy to be able to announce that the case had been settled. The defendants still believed that they were legally in the right, but they could not disguise the fact that, owing to their mistake, a certain amount of hardship had been inflicted on the plaintiff.—A verdict was then formally taken by consent for the plaintiff for £125.

In re G. Colls.—The bankrupt, who recently presented a petition for the liquidation of his affairs, was a builder and licensed victualler, carrying on business at Bayswater and Earl's Court, and also at the Bell Hotel, Addle-hill. At the first meeting the liquidation proceedings fell to the ground, and an adjudication followed. This was a sitting for public examination, and the balance-sheet returned liabilities amounting to £5,500; fully-secured debts, £30,985; with assets (inclusive of an estimated surplus from property in the hands of creditors), £3,884. The Registrar, at the instance of the trustee, on Wednesday ordered certain explanatory accounts to be filed, and adjourned the sitting in the mean time.

Liability for Quantities.—At Southampton County Court, on Tuesday week, H. Morris, architect and surveyor, of Freemantle, sued J. W. Rowland, builder, Southampton, for £32 10s. commission on preparing bills of quantities in connection with Christ Church, Above-bar, Southampton. Plaintiff was architect of the church, and in that capacity took out the quantities. Defendant obtained the contract for erection, but had not settled this account for commission. It appearing that the action was a friendly one between plaintiff and defendant, at the suggestion of the judge, the client for whom the church was built, a Mr. Earl, was made co-defendant. It was proved in evidence that Mr. Earl told defendant to strike the item 1½ per cent. for quantities from his contract, as he should pay direct for a copy of the bill of quantities. The judge, having shown Mr. Earl the difference between taking out quantities and the making of a copy of the bill, ordered Mr. Rowland to pay 30s., the cost of the copies he had received, and Mr. Earl to pay £20 17s. for taking out the quantities, after allowing a set-off of £9 as penalties for plaintiff's delay in preparing plans.

Mr. James S. Swallow, late of Scarborough, has been appointed city surveyor of Cape Town.

WATER SUPPLY AND SANITARY MATTERS.

Hawes and Gayle Sewerage.—This work has been commenced by the contractor, Mr. Richard Atkinson, of Ingleton; Mr. Russell acting as clerk of works. The sewage is to be utilised upon land specially prepared for surface irrigation and deep filtration, the gross solids being intercepted in suitable tanks. Messrs. Brierly and Holt, C.E., of Blackburn, are the engineers acting for the Rural Sanitary Authority of Aysgarth Union, county of York.

Birmingham.—A special meeting of the Birmingham, Tame, and Rea District Drainage Board was held on Tuesday, at the Council House, Birmingham; Alderman Avery presiding. In accordance with the recommendation of the Works Committee, approval was given to an agreement for the purchase of 48 acres of freehold land, buildings, &c., at Tyburn, for the sum of £6,000, and it was resolved to apply to the Local Government Board for their sanction to a loan of various sums amounting in the whole to £180,000, for the purchase of land and the construction of works.

Wednesbury.—The Wednesbury Local Board has resolved that Mr. Pritchard, of Waterloo-street, Birmingham, report as to what system of sewerage would be advisable for the town, and what land would be required for that system.

CHIPS.

The organ in Farnham parish-church, Surrey, is about to be removed to a new chamber and improved. Mr. Woodyer, of Guildford, is the architect, and Messrs. Walker are the builders; the cost of the work will be about £1,300.

The Council of the Royal Albert Hall have published a notice stating that they are prepared to receive for exhibition in May next such works of art as have been submitted during the present year to the Council of the Royal Academy of Arts and conditionally retained by them, but which cannot be placed at Burlington House for want of space. The days for the reception of these works will be the 25th and 26th of April.

The Lincoln Urban Sanitary Authority accepted last Tuesday the schedule of prices sent in by Messrs. Cowen and Lansdown for the connections to main sewerage. The authority refused the lowest tender of Mr. R. Carden, and the Messrs. Burns Brothers withdrew their tender, which was the next lowest.

A new building for the Northern Assurance Company is about to be erected at the corner of Commercial-street and Albert-square, Dundee; Messrs. James Maclaren and Sons are the architects.

Messrs. T. Robinson and Son, Limited, of Rochdale, have received a cable message from Melbourne, stating that they have been awarded three first-class prizes at the Melbourne Exhibition, the highest award in each class of their exhibits of wood-working machinery, steam-engines, and boilers.

In the list of bankrupts published in Tuesday's *London Gazette*, appeared the name of Frederick George Helmore, architect, of 23, Leadenhall-street, City.

A new storage reservoir, to contain nineteen million gallons of water, and two filter-beds are about to be constructed for the Pontypridd Waterworks Company on high ground in the parishes of Aberdare and Ystradyfodwg. The engineer of the works is Mr. S. Harpur, of Pontypridd.

The town council of Newport, Mon., resolved on Tuesday to form a main thoroughfare through the town at an estimated cost of £50,000.

The Court of Assistants of the Drapers' Company have this week decided to increase their subscription to the City and Guilds of London Institute from £2,000 to £4,000 a year for two years, the augmentation to be devoted to the new building and its fittings in Finsbury.

The council of the Royal Institute of British Architects have accepted Mr. Ernest Turner's offer to present a silver medal for sanitary science to the candidate in the first obligatory examination under By-law XIV. who most distinguishes himself in subjects connected with sanitary science.

For some years past there has been a great deal of building going on in and around Salisbury, adding considerably to the house accommodation of the city. During last year no less than 213 new houses were built, and a large number of others are now in course of erection in Wyndham's Park and on the Manor and School estates adjoining.

The Gainsborough highway board last week elected Mr. Francis Potter as surveyor, in lieu of Mr. Lamb, resigned. The salary is £150 per annum, and there were 58 candidates for the appointment.

Our Office Table.

A lecture on "Sanitary Assurance" was delivered on Tuesday evening at the London Institute by Professor F. de Chaumont, F.R.S., who remarked that in round numbers one-third of the whole mortality of the country was due to consumption, diseases of the respiratory organs, diarrhœa, enteric and scarlet-fever, and diphtheria. All these were diseases favoured or propagated by neglected house sanitation, and disease was chiefly caused in insanitary dwellings by foul air and foul water. Means ought to be provided for removing bad air and admitting fresh air, and for protecting the water supply from close connection with the sewers. Dr. de Chaumont then explained the aims and scope of the recently-formed Sanitary Assurance Association, with which our readers are already familiar, and pointed out that the organisation was not formed with the purpose of obtaining a profit. The carrying out of such a measure of compulsory inspection of dwellings by the State could hardly, he thought, be sanctioned either by Parliament or public opinion at present; but it was desirable that the work should be undertaken by private enterprise in the mean-time.

A scheme is on foot for placing the churchyard of St. Margaret's, Westminster, in a condition more in harmony with its character and surroundings. At present the churchyard is an unenclosed space, and is in a most neglected condition. It is proposed to surround it with a handsome palisade, and to lay out the ground in a proper manner. Part of the ground belongs to the Government, and the First Commissioner of Works has promised that the Government will contribute a portion of the expense. It is also expected that the Metropolitan Board of Works will assist in the work; but it will still be necessary to raise a sum of two thousand pounds by public subscriptions.

The Secretary of the Science and Art Department states that the apparatus placed by Mr. A. C. Engert in the Chemical Lecture Theatre at the Science Schools, South Kensington, is found to remedy the acoustic defects of the room to a very considerable extent. The department regrets that it has been impossible for Mr. Engert to apply his invention in its entirety, as he could not be permitted to touch the wall behind the lecturer's table.

Mr. T. J. Gawthorp, of Long Acre, has sent us a copy of his illustrated catalogue of memorial brasses. He points out the fact that many "brasses" of the 13th and 14th centuries are now in good preservation, whilst the adjoining designs in marble or stone are lost, thus proving their value as a record of the past. Assays of the metal on which these were engraved have been made, and one of like alloy, and consequently quality, expressly manufactured for the purpose. This "Latten" brass is thick, hard, of a deep rich colour, but, unlike the Birmingham yellow or zinc brass, does not corrode. Mr. Gawthorp also calls attention to his introduction of engraved bronze for memorials. The metal he uses is an alloy of pure copper and tin without any admixture of zinc, equivalent in durability to the ancients' bronze. The great age of these old "bronzes" is alone sufficient to prove that copper and tin in right proportion may indeed be regarded as indestructible. Unlike "brasses," the engraving is not filled in level with the surface of the metal (a cover under which unscrupulous engravers of cheap brasses hide bad work, with a view to extra profit, regardless of durability), but thinly coated with a deep colour to give greater legibility. Those who prefer a more subdued appearance than the brilliancy of brass, would find this kind of memorial supply the want. It is suitable for fixing on the floor, walls of churches, or on tombstones in churchyard or cemetery.

The Great Eastern Railway Company have withdrawn that portion of their Bill which related to the Epping Forest Extension. This is a reasonable and just concession to public opinion which will be appreciated by all except the City Corporation, whose support, for some occult reason, was accorded. Probably in some way or another some job was in contemplation; else it is hard to say why the conservators of the forest should have been so eager to surrender its chief charm.

AT Monday's meeting of the corporation of Dublin, a decision was come to with reference to the paving contracts for the south side of the city, which have been at a dead-lock for some months. Originally the tender of Messrs. Worthington was accepted for the paving of the portion of Dublin south of the Liffey, and that of Messrs. Spaight for the northern portion of Dublin. Messrs. Worthington are carrying out their contract, but Messrs. Spaight became bankrupt, and an action has been commenced against the corporation by a Mr. Moore on account of their contract. At Monday's meeting of the corporation, Mr. E. D. Gray, M.P, ex-lord mayor, reported that Messrs. Worthington had offered to take up the northern paving contract, and to guarantee the corporation against loss on Mr. Moore's action to the extent of £2,000, that sum to be lodged in a bank at once, and recommended that this be accepted, on condition that Messrs. Worthington undertake entire responsibility for Mr. Moore's action. Many members of the corporation objected that this was giving a monopoly of the paving to one firm, but eventually the motion was agreed to. Messrs. Worthington's terms for the north side paving are 13s. 3d. per yard, with maintenance for three years, and 10d. per year afterwards. Memel-wood blocks to be used.

THE 31st annual meeting of the Architects' Benevolent Society was held on Wednesday week, under the presidency of Mr. H. Currey. The annual report referred to the important change which had been effected in the management of the Society's affairs, by the action of the Institute in allowing the whole of the Society's business to be transacted in the Institute premises. Mr. W. H. White, the secretary of the Institute, had been elected hon. secretary of the society, a collector had been dispensed with, and other alterations made, tending to curtail extraneous expenditure. During the year 27 cases had been relieved at a cost of about £400. The funded property of the society amounted to £5,453, but the total subscriptions barely exceeded £300, and last year only 140 of the 800 professional members of the Institute contributed to the funds. The report was adopted and also the balance-sheet, and a general revision of the "Rules" and "By-laws," rendered desirable by the new relations with the Institute, having been proposed by the Council, the "Rules" were ordered to be embodied in the by-laws, and the proposals of the council with reference to the revision of the same were discussed, amended, and adopted. The following officers were elected for the ensuing year:—President, John Whichcord, F.S.A., P.R.I.B.A.; Council: Ewan Christian, Professor Lewis, F.S.A., A. W. Blomfield, M.A., J. P. St. Aubyn, W. A. Boulnois, Henry Currey, Arthur Cates, J. H. Good, H. L. Florence, E. N. Clifton, E. A. Gruning, E. I'Anson, F.G.S., George Scamell, F.G.S., Thomas Wells, Matt. Wyatt. Hon. Treasurer: Geo. J. J. Mair, F.S.A.; Hon. Secretary: William H. White.

Epps's Cocoa.—Grateful and Comforting.—"By a thorough knowledge of the natural laws which govern the operations of digestion and nutrition, and by a careful application of the fine properties of well-selected Cocoa, Mr. Epps has provided our breakfast tables with a delicately flavoured beverage which may save us many doctors' bills. It is by the judicious use of such articles of diet that a constitution may be gradually built up until strong enough to resist every tendency to disease. Hundreds of subtle maladies are floating around us ready to attack wherever there is a weak point. We may escape many a fatal shaft by keeping ourselves well fortified with pure blood and a properly nourished frame."—*Civil Service Gazette.*—Sold only in Packets labelled—"JAMES EPPS and Co., Homœopathic Chemists London."—Also makers of Epps's Chocolate Essence for afternoons

CHIPS.

The North Muskham Board-schools have been just completed for 172 children, from designs prepared by Mr. Geo. Sheppard, borough surveyor, Newark. The total cost, including fence, walls, schoolrooms, and master's residence, is £1,038. This is exclusive of the site.

The district of Chipping-hill has just been sewered for the local board of Witham, Essex. The work was carried out by Mr. J. Gamble, contractor.

The annual dinner of the Croydon District Master Builders' Association was held on Thursday, the 10th inst., at the Greyhound Inn, Croydon, when upwards of 100 members assembled. The president, Mr. C. Bowyer, of the firm of J. and C. Bowyer, of Upper Norwood, occupied the chair.

An executive committee for the restoration of Ashburton parish church was held on Thursday week, and it has been decided to place the restoration in the hands of Mr. G. E. Street, R.A.

A marble bust of the late Lieut. Shergold Smith, R.N., who died while in the service of the Church Missionary Society in Africa, was unveiled on Monday at the Church Missionary House, Salisbury-square, Fleet-street. The bust was executed by Mr. Henry Harvey, of Chelsea.

Mr. John Appleby, assistant county surveyor for Cork, was assaulted on Monday and had his skull fractured, whilst proceeding on horseback to prosecute some road contractors for non-fulfilment of contract.

An inquiry was held at Acton on Friday before Mr. Robert Morgan, C.E., an inspector of the Local Government Board, in reference to an application from the local board of Acton for compulsory power to acquire land for sewage disposal, in accordance with a scheme prepared by Messrs. J. Bailey Denton and Son.

Those who are entrusted with the fixing of memorial tablets ought to exercise extreme care that the heavy slab of stone or marble is securely bedded into the walls and cramped with iron ties; any scamping of the work may result in a disastrous fall, probably at some far distant period. It is stated that the Bishop of Worcester had a narrow escape from injury last week at his residence, Hartlebury Castle. Over the door of the library was a massive marble tablet erected 70 years ago in memory of Bishop Hurd; this suddenly fell forward upon the spot where the present bishop had been standing but a minute before. A few years since a marble tablet, to the memory of the Rev. John Burnet, fell from the wall of Camberwell-green Congregational Church, smashing the pulpit, but gave way fortunately at a time when the chapel was unoccupied.

The second section of the South London Tramway Company's line from Nine Elms to Clapham Junction was opened on Saturday last.

The Cardiff town council held a special meeting on Monday to discuss the question of additional water supply for the inhabitants of the town, when it was resolved to instruct the borough surveyor to prepare a report on all the available sources of supply to Cardiff, with power to engage some eminent mining or civil engineer to assist him in his report.

The new church of St. James, Forest-gate, Stratford, was consecrated on Thursday week. It consists of nave and aisles of six bays, chancel, transepts, porches, and vestry, with provision for a future tower and spire. The style is Early English; and the walls are of brickwork, unplastered inside, and the fittings are of pitch-pine. One thousand sittings are provided, at a cost for erection of about £5,000. Messrs. Habershon and Fawckner, of Bloomsbury-square, are the architects, and Messrs. W. and H. Castle, of Red Cross-street, the builders.

It is proposed to erect a town-hall at Ramsgate, from designs by Mr. Barley, the town surveyor, at an estimated cost of £18,000.

A block of shops and houses has been in course of erection in Angel-lane, Stratford. Two of the centre houses on Wednesday fell in with a loud crash. One man was severely injured, and it is feared that some of the workmen are in the ruins. The remainder of the block is shored up, two other houses being in a dangerous condition.

Messrs. W. Walker and Sons, of Bunhill-row, have been informed by telegram that they have received a first-class award for furniture at the Melbourne Exhibition.

ROYAL INSTITUTE of BRITISH ARCHITECTS.—Candidates for Membership are hereby informed that the ONLY REMAINING BALLOT of this Session will take place on MONDAY the 23rd May, and that the NOMINATION for that Ballot will take place on MONDAY, 28th inst. Candidates must, consequently, send their papers to the undersigned not later than SATURDAY, the 26th inst.
J. MACVICAR ANDERSON, Hon. Sec.
WILLIAM H. WHITE Secretary.
9, Conduit-street, Hanover-square, London, W.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—A Special General Meeting of Members only will be held on MONDAY, 21st inst., at 8 30 p.m., in accordance with By-laws LXXI. and LXXII., to authorise the suspension of By-laws XXV., XXIX., and LXX., in so far as they relate to the holding of the Annual General Meeting on the first Monday in May, and to authorise the holding of such ANNUAL GENERAL MEETING FOR THE CURRENT YEAR on the second Monday in May, that is to say, the 9th May, 1881.
J. MACVICAR ANDERSON, Hon. Sec.
WILLIAM H. WHITE, Secretary.
9, Conduit-street, Hanover-square, London, W.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—London Institution. "Fungi." By Prof. R. Bentley. 5 p.m.
Society of Arts. "The Scientific Principles Involved in Electric Lighting." Cantor Lecture No. 3 By Prof. W. G. Adams, F.R.S. 8 p.m.
Institution of Surveyors. "Sanitation as an Important Increment of Value in House Property." By H. H. Collins. 8 p.m.

TUESDAY.—Institution of Civil Engineers. "The Comparative Endurance of Iron and Mild Steel when Exposed to Corrosive Influences." By D Phillips, M.I.C.E. 8 p.m.

WEDNESDAY.—Society of Arts. "The Increasing Number of Deaths from Explosions, with an Examination of the Causes." By Cornelius Walford. 8 p.m.

THURSDAY.—Royal Institution. "Ornament." By H. H. Statham, No. 2. 3 p.m.
London Institution. "The History of the Suite" (illustrated musical lecture). By Ernst Pauer. 7 p.m.
Society of Arts. "The Future Development of Electrical Appliances." By Prof. Perry. 8 p.m.

FRIDAY.—Society of Arts. "The Tenure and Cultivation of Land in India." By Sir George Campbell, K.C.S.I., M.P. 8 p.m.
Royal Institution. "Weather and Health of London." By A. Buchan. 9 p.m.

Lamplough's Pyretic Saline is refreshing, most agreeable, and the preventive of FEVERS, BILIOUSNESS, SMALL POX, SKIN DISEASES, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill. *Use no substitute* —[ADVT.]

Holloway's Pills—the sheet anchor of the confirmed dyspeptic. A few trials will prove their potency in removing indigest on billousnes, nausea, eructations, loss of appetite, want of sleep, and that utter weariness which always waits on a out and disordered stomach. They act as alteratives, sedatives, and gentle aperients.

Trade News.

WAGES MOVEMENTS.

WIGAN.—A difference arose last January between the Wigan master bricklayers and the members of the London Order of Operative Bricklayers, in reference to wages, hours, and the general rules, there being every appearance of the dispute terminating in a strike. To avoid this, the arbitration rules were acted upon, and it was decided that each party should withdraw the notices given. The rules are left exactly as they were, and this step practically settles the working hours and wages for the whole of the building trade of Wigan and district until May, 1882.

CINDER-SIFTING ASH CLOSETS
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Norton-sub-Hamdon, Ilminster, Somerset.
—[ADVT.]

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[ADVT.]

TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender—it adds to the value of the information.

BLACKBURN.—For alterations, &c., to warehouses in Ainsworth-street, for Messrs. E. S. Comberbach and Sons. Mr. J. R. Duckworth, 128, St. Donatts-road, New Cross, London, architect:—

Duckworth, H. and A., Blackburn	£155	0	0
Fletcher and Bolton, Blackburn ...	149	12	0
Stones and Son, Blackburn... ...	147	0	0
Marshall and Dent, Blackburn* ...	133	0	0

* Accepted.

BLIND BUILDERS.—For the erection of four houses, for Mr. Isaac Hattersley. Mr. Thos. Martin, surveyor:—

Cowen and Lansdown, Lincoln ...	£798	0	0
Wright, W., Lincoln...	787	0	0
Woolhouse, J. and H., Lincoln ...	780	0	0
Horton, T., Lincoln*	662	0	0
Chambers, J., Lincoln	596	10	0
Cox, W., Lincoln (accepted) ...	595	0	0

[The tender marked * did not include front fencing and palisading nor back fence wall, amounting to over £50.]

CHELSEA.—For alterations at Church-street, Chelsea, for the London General Omnibus Company. Mr. Josh, architect. Quantities by Mr. Bolton:—

Godden, S.	£605	0	0
Richeirs and Mount	515	0	0
Brown, H.	499	0	0
Evans	490	0	0
Boyce	469	10	0
Lucas and Son	467	0	0
Richardson	455	10	0
Beale	448	0	0
Judd	420	0	0
Garrud	419	15	0

CITY OF LONDON.—For the execution of masons' and pavior's work for the term of three years, for the commissioners of sewers for the City of London:—

Mason's work:—

Rutty, G. G.	at scheduled prices.
Aspinall and Son	3½ per cent. below.
Turner and Sons	5 " "
Beevers, E. and H. (north and west districts)	5 " "
Do. (south and east districts)	10 " "
Griffiths, J. J.	7½ " "
Mowlem and Co. (accepted)	15 " "

Pavior's work:—

Rutty, G. G.	at scheduled prices.
Aspinall and Son	2½ per cent. below.
Griffiths, J. J.	5 " "
Turner and Sons	5 " "
Beevers, E. and H. (west and north districts)	5 " "
Do. (south and east districts)	10 " "
Mowlem and Co. (accepted)	12½ " "

COLCHESTER.—For a printing-office, for Mr. W. Wiles, in Trinity-street. Mr. J. F. Goodey, architect:—

Chambers, A., Magdalen-street	£258	10	0
Everett, H. and Son, Hythe-hill	243	0	0
Diss, A., West Bergholt	240	10	0
Ward, J., St. John's-st. (accepted)	213	10	0

DUBLIN.—For building labourers' cottages at Baldoyle, for the corporation of Dublin:—

Connolly and Son (accepted)	£1,275	0	0

GUILFORD.—For the erection of a new Roman Catholic church in Chertsey-street. Mr. E. Ingress Bell, of London, and the Parade, Epsom, architect:—

Pittars and Fotherington, London	£3,785	0	0
Williams, London	3,598	0	0
Woodbridge, London	3,470	0	0
Carruthers, Reigate	3,432	0	0
Smith, W. and Sons, Guildford	3,292	0	0
Pink, Milford	3,042	0	0
Mitchell, Bros., Shalford (accepted)	2,816	0	0

HASTINGS.—For the erection of villa, for M. Hurlstone, Esq. Mr. D. Jones, architect, 29, St. James's-road, Hastings. Quantities supplied:—

Cousens, W., Hastings	£865	0	0
Womersley, A. D., Hastings	858	0	0
Avis, F., Hastings (accepted)	829	0	0
Stubberfield, J.	828	0	0

HIGHFIELD.—For two houses at Highfield, for Henry Scrase, Esq., J.P. Quantities supplied:—

Stevens and Son, Southampton	£556	0	0
Sandon, Southampton	538	0	0
Holt, Freemantle	527	0	0
Bailey and Son, Southampton	523	10	0
Martin, R. R., Southampton	510	0	0
Cole, Wm., Freemantle	507	0	0
Palmer, Freemantle	507	0	0
Bostock, Southampton	499	14	4

LOFTUS-IN-CLEVELAND.—For new bank, for the North Eastern Banking Co. Mr. W. Lister Newcombe, F.R.I.B.A., architect, Newcastle-upon-Tyne:—
Dickinson, T. (accepted).

LONDON.—For a warehouse, Aldermanbury, E.C. Messrs. Ford and Hesketh, architects:—

Kirk and Randell	£5,071	0	0
Hart, H.	4,946	0	0
Peto, Bros.	4,840	0	0
Conder, R.	4,661	0	0
Lawrence, E.	4,660	0	0
Perry and Co.	4,622	0	0
Adamson and Sons	4,574	0	0
Simpson and Son	4,551	0	0
McLachlan and Sons	4,538	0	0
Scrivener and Co.	4,514	0	0
Ashby, Bros.	4,473	0	0
Brass, W. (accepted)	4,395	0	0

LONDON.—For alterations to plant at Messrs. Gordon and Co.'s brewery, Caledonian-road. Messrs. Scamell and Colyer, 18, Great George-street, Westminster, consulting engineers:—
Bennett, J. J. and Son (accepted).

LUDDENDEN-FOOT.—For the erection of a bridge over the Calder, for the local board of Luddenden-foot, near Halifax. Messrs. Uttley and Gray, engineers:—

For masonry:—

Wild, J. (accepted)	£1,850	0	0

For ironwork:—

Wood and Co. (accepted)	1,214	0	0

MEGAVISSEY.—For the erection of an infant-school, for the Megavissey school board:—

Kessel, W. H., St. Austell	£580	0	0
Roberts, B. H., Megavissey	539	0	0
Kitto and Pawlyn, Megavissey*	529	0	0
Body, J., Megavissey (for carpenter's work only)	190	0	0

* Accepted.

NEWARK-UPON-TRENT.—For the erection of a villa residence, Appleburgate, Newark, for Mr. Robinson, coal merchant. Mr. Geo. Sheppard, architect:—

Cosham	£1,586	10	0
Doncaster	1,560	0	0
Duke	1,560	0	0
Bulling	1,550	0	0
Smith and Turner	1,500	0	0
Whale	1,450	0	0
Baines (accepted)	1,350	0	0

NEWCASTLE-UPON-TYNE.—For building *Tyneside Echo* printing-office, Denton Chare. Mr. W. Lister Newcombe, F.R.I.B.A, architect:—
Scott, W. (accepted).

PORTSMOUTH.—For the Omega-street board-schools, for the Portsmouth School Board (accommodation for 923 children). Mr. A. H. Ford, A.M.I.C.E., architect, Portsmouth:—

Jones and Co., Gloucester	£8,750	0	0
Longley, J., Worth, Sussex	8,568	0	0
Quick, T. W., Southsea	8,363	0	0
Burbidge, G., Southsea	8,265	0	0
Light, W. C. and R., Landport	8,190	0	0
Ward, W., Southsea	7,926	0	0
Tull, E., Southsea	7,900	0	0
Hayter, T. B., Landport	7,795	0	0
Evans, H. and W., Southsea	7,777	0	0
Cooper, T. C., Landport	7,513	0	0
Lewis, D. W., Southsea	7,425	0	0
Earwaker, T., Southsea	7,200	0	0

(Architect's estimate, £7,600.)

READING.—For house in the Balmerslie-road, for Mr. W. Belcher. Mr. William Simmons, architect, Reading. No quantities:—

Wernham	£468	0	0
Blake	465	0	0

REDDITCH.—For Redditch sewerage works. Messrs Gotto and Beesley, engineers:—

Dyer, Camberwell	£12,733	0	0
Coker, Luton (too late)	11,707	0	0
Ridal and Armson, Sheffield	10,317	0	0
Rigby, Worksop	9,900	0	0
Davison, Shildon	9,718	0	0
Jevons, Dudley	9,033	0	0
Dickson, Sevenoaks	8,999	0	0
Harris, Great Harwood	8,770	0	0
Mackay, Hereford	8,311	0	0
Raynor, Liverpool	8,259	0	0
Currall and Lewis, Birmingham	8,100	0	0
Burkitt, Birmingham	8,100	0	0
Smith, Westminster	7,975	0	0
Jones & Fitzmaurice, B'mingham	7,960	0	0
Vale, Kidderminster (too late)	7,920	0	0
Smith, Basford	7,149	0	0
Law, Kidderminster (accepted)	7,051	0	0
Fell, Leamington	6,239	0	0

SHADWELL, E.—For the erection of a fire-brigade station in Glamis-road, Shadwell, for the Metropolitan Board of Works:—

Ashby and Horner (accepted)	£8,670	0	0

SITTINGBOURNE.—For erection of hospital for infectious diseases, to accommodate 24 beds, Keycol Hill, Sittingbourne. Mr. W. Leonard Grant, architect, Sittingbourne:—

Hopper, Rochester	£4,405	0	0
Seager, Borden	4,149	0	0
Naylar, Rochester	4,146	0	0
Jones and Co., Gloucester	4,090	0	0
Vaughan, Maidstone	4,050	0	0
Adcock, Dover	4,045	0	0
Shrubsole, Faversham	3,988	0	0
Callund, Roches er	3,970	0	0
Denne, Walmer	3,890	0	0
Pavey, Sittingbourne	3,889	0	0
Cornelius, Whitstable	3,849	0	0
Beaumont, Milton (accepted)	3,847	0	0
Judges, Boughton	3,475	0	0
Hughes, Whitstable	3,421	0	0

(Architect's estimate, £3,880.)

SOUTHAMPTON.—For chancel and reseating St. James' Church, Shirley, Southampton:—

	Chancel.	Seats.	Total.
Dyer	£1,019 0 0	£400 0 0	£1,419 0 0
Bull and Sons	975 0 0	376 0 0	1,351 0 0
Chapman	960 0 0	629 0 0	1,589 0 0
Bunt n and Bone	950 0 0	520 0 0	1,470 0 0
Stevens and Son*	945 0 0	394 0 0	1,339 0 0

* Accepted.

YARMOUTH.—For the supply of 300ft. of iron piling for the protection of the Fishwharf Quay, for the town council of Great Yarmouth:—
Williams and Co., London (accepted) £7 10s. per ton.

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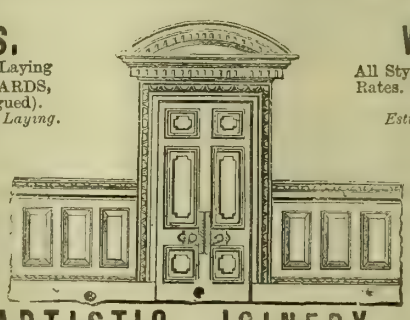

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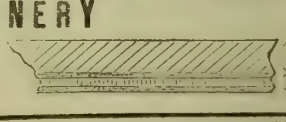

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THE BUILDING NEWS.

LONDON, FRIDAY, MARCH 25, 1881.

ILLUSORY SANITATION.

SINCE the institution of local and other Boards charged with the duty of protecting us from the dangers consequent on an improved system of sewerage, ills before unthought of have unpleasantly developed themselves, creating dismay instead of hoped-for comfort and contentment. In the gradual and unavoidable transfer of our personal control of the evils of the house to those endowed with popular as well as legal authority, we lost our individuality, and while contributing to the costs of such machinery became mere helpless units in the force by which it is impelled and governed. Ever since drains and their controlment budded into a science, many a theorist has had ample opportunity of airing his opinions, but in the course of the numerous tentative blunderings, much evil and discomfort has been inflicted. To add to what in itself was trying enough, *progress* developed new types of disease hitherto unknown, and the disturbed and conflicting views of our medical authorities added substantially to the dangers of the situation. Hence, like in other matters of a domestic character, an unsettled feeling of distrust has arisen, leading the afflicted—we might even say the oppressed—to grasp at any seeming chance of relief from the uncomfortable and dangerous character of their unsanitary surroundings. Modern un-sanitariness, when dissociated from the complex and bewildering phrases which engineering and medical scientists have surrounded it, is a very simple question indeed, for it only really means that the dwelling and its inhabitants have become endangered by a neglect of the most ordinary health-preserving precautions. Whether these dangers are self-sought or vicariously inflicted, does not very materially affect the question, for their existence, under any circumstances, necessitates the most serious attention to their remedy or removal. We may take it, however, that much discord and disagreement prevails amongst those professing to have special knowledge of what is now generally accepted as sanitary science and its complex teachings.

These considerations readily occur to us at the present time from the recent organisation of a sanitary insurance society, launched under doubtless creditable auspices, and framed on the model of a similar institution, believed to be doing good and honest service in the metropolis of Scotland. All things must have a beginning, and it is a healthful sign of progress in any direction, when it is founded on a basis practical and trustworthy in character. Such, we may fairly assume, the parent Sanitary Insurance Society of Edinburgh to be; but, before accepting its teachings or implicitly pinning our faith to its guidance for dealing with a great city like London, we need not be blamed for examining the relative surroundings of the two cities, and considering whether what is good for Edinburgh is equally good for the Metropolis.

Edinburgh is favourably circumstanced as to site which, from a geological point of view, is unexceptionable in facilitating, by the peculiarly favourable character of the rock on which it is built, a ready deliverance of its rainfall and sewage to the conveniently near sea-outlet at Portobello. The solid and substantial character of the buildings, and wide and well-conditioned streets of the Modern Athens, are also good and useful factors in securing a tolerably fair state of sanitary comfort. We refer generally to the newer portions of the city, for the Canongate and other similarly circumstanced ancient localities are not by any means perfect in their sanitary surroundings. The city of Edinburgh also, has another and special advantage from its having been the first large community which derived any benefit from the utilisation of its sewage, as the long continued fertility of a portion of the Portobello sands testify.

A city so circumstanced and occupied by a comparatively limited high-class population, offers peculiar facilities for the successful treatment of its sewage, due, primarily, to the precipitous character of its site securing a high velocity for its passage to a good and contiguous sea-outfall. There are few, if any cities, which command similar advantages, and under intelligent control, sewer gas, as understood in London, need not have any existence in Edinburgh at all. Constructive science generally is in a much better condition, the quality and character of the masonry being better than work for similar purposes in London; for, in the northern city, the "jerry builder" has not yet, nor is he likely, to obtain a footing equal in importance to that which he commands in London.

We have thus glanced at the conditions which, by their exceptionally favourable influence on the sanitary state of Edinburgh, and which are being offered as the model, whereby a protection society is to be established for the well-being of the inhabitants of London. Under any circumstances, the difference in extent between the two cities would interpose difficulties in the way of establishing sound and healthy sanitary control and government, let alone the almost insuperable obstacles, the inheritance of governmental supineness and constructive defects. Like unto many other great cities of ancient as well as modern times, London is placed upon the banks of a tidal river which, until very recent times, received all its drainage, and sometimes worse, of whatever kind which its inhabitants could not otherwise dispose of. It was not until the abandonment of cesspools and the introduction of larger supplies and use of water that any evil effects were recognised in the use of the Thames as the main scavenger, to whose care was entrusted the waste of London's citizens. When, however, increasing population, and a better appreciation of what may be termed "personal cleanliness" developed to an alarming extent, the river was no longer competent to accept its ancient office without rendering its waters so impure as to create a nuisance which, during certain seasons, almost prohibited its use for pleasure purposes. The malodorous stream therefore, in all its nastiness on one hand, and the congestion of inland sewage on the other, ultimately resulted in the organisation of a powerful body invested with popular authority to undertake the government and control of the main or arterial drainage of London. The area apportioned for the exercise of the Metropolitan Board of Works' rights and authority was limited and prescribed in character, embracing, however, all the parishes proper of the city and suburbs. The physical conditions, however, of the space to be dealt with, were much more unfavourable than those at Edinburgh, neither was the authority so concentrated or effective in its capacity of control. The interception of the drainage of all kinds, was the first condition on which the Board purposed to base their ultimate operations and accordingly the main sewers were designed to receive and convey to outfalls the whole filth of London and its affiliated parishes. The natural fall of the river Thames in its circuitous course was not very considerable, and as the selected points of outfall were on its banks, any improved gradients of the drains were only possible by reduced length and depressed reservoirs of discharge. The conditions, therefore, controlling the scheme of London drainage are very different, and much more onerous than those existing at Edinburgh, or, indeed, anywhere else in this country. Simple collection and controlment of the accumulated sewage produced from a population of something like 4,000,000 of people, is not, by any means, an easy task, but to provide for its removal or extinguishment is even more difficult. We shall endeavour to describe the machinery by which this task is accomplished.

Tidal influences prevent the free and continuous discharge of the accumulated sewage, and it is therefore desirable only to pump out the contents of the north and south reservoirs at flood-tide, or practically twice during every twenty-four hours. The obvious reason for this arrangement is that theoretically, at least, the receding tide conveys the sewage and its associated belongings to distant points which are not supposed to be prejudiced by its deposit, for, according to all natural laws, its total extinguishment is impossible.

Such, then, under normal conditions is the position of the London main drainage, as now controlled, and to the government of which all other subsidiary drainage is amenable or subordinate. The householder, however desirous he may be of rendering his home proof against the insidious influence of sewer-gas cannot control the insuperable defects inherent in the very inception, execution, and government of the main drain proper itself. He is bound to connect his house, and to pour into the main channel all and every iota of excreta, &c., produced by him and his surroundings into a noisome stream, which already contains, according to the position in which it is emptied, the outpourings of hospitals and divers populations. It is this kind of unavoidable bondage which creates one of the most dangerous difficulties of the sewerage system, for it complicates and intensifies the dangers of the ordinary householder. To clear his house of what, under the modern system of cleansing is regarded as a dangerous common nuisance, he becomes intimately associated with the almost illimitable, and certainly indefinable accumulated refuse of, it may be, millions of his fellow subjects, who, in the universal thraldom of main-drainage slavery are helplessly compelled to submit to the lot apportioned them by the controlling authorities. The cleansing of the river Thames by the interception of the London sewage, not only overcame the crying evil of a polluted stream, but it promised comfort to the luxurious inhabitants of a great city, who disregarded the evils likely to follow from such a system when it apparently secured present immunity from the dangers and annoyances of a complex system of cesspools and imperfect drains.

The new dispensation, however, in its complicated surroundings begets evils hitherto unknown, and it is from such dangers that the modern sanitary engineer and scientist promises relief and safety. The main sewer traverses in its tortuous course all sorts of conditions of localities and neighbourhoods, and becomes charged with the most heterogeneous contributions from pure as well as polluted sources. Under such circumstances, therefore, the huge and, in constructive sense, substantial sewer conduit becomes a retort for the production of gaseous products, which, from uncontrollable natural laws ascend, finding vent in the weak points of the concomitant subsidiary drains, thus insidiously entering the dwelling, thus engendering disease, and

inducing death. From the extreme west to the distant east of the huge aggregation of streets and dwellings of London, and its affiliated suburbs, the slow wending stream of pollution drags its slow course along, receiving, from various tidal and other influences, checks to its onward progress towards the point of its ultimate river discharge. Conserved for a brief and naturally-defined space of time in the huge reservoirs, it is emptied by mechanical agency on the full tide, which theoretically is supposed to float it seawards, thus securing its removal beyond further baneful influences. This question of removal is of great and paramount importance, which, in the future, will receive some sensible solution, for at present there is much diversity of opinion as to the efficacy of existing means of sewerage disposal. A but recent alarm in the Firth of Clyde, on the banks of one of its numerous and beautiful lochs, seems to show that sewage matter, however carefully dealt with is the source of ultimate danger at the seat of its disposal. The dredged mud from the malodorous Clyde, into which Glasgow empties its sewage and other abominations, is by means of hopper barges deposited in a deep loch upwards of 25 miles distant from that city. Careful medical examination, influenced by the appearance of new types of disease, proves that they are engendered by the deposit of Glasgow sewage mud, which gradually, even from the depths of its deposition, forms, on the shores of a beautiful loch, poisonous matter, which converts one of the healthiest seaside resorts into a pestilential fever centre.

London, in like manner, although, by somewhat different means, is freed from its filth; but unlike Glasgow, its population suffers during the process of collection and storage from the poisonous sewer gases which its accumulation unavoidably occasions.

The difficulty, therefore, in contending with sanitary improvements in London is much greater than any other city, because the length and capacity of its main drains create and store up poisonous matter, difficult of controlment, or even elimination. Under certain conditions, indeed, such as those created by heavy rainfalls and floods, an hermetically sealed house-drain connections would be almost incompetent to withstand or resist the pressure of the pent-up gases of many miles of main drain. There is no present possibility of increasing the velocity of these sluggishly-driven sewage streams, and therefore the sanitary expert, in setting about his task of remedy, must first deal with an evil over which he can exercise no appreciable control. He must fight the demon of disease by remedial rather than by preventive means, and the Herculean task of effectively rendering a sewage-connected London dwelling proof against the entrance of gases is one of difficult performance. Even if the surroundings of the case were in themselves simple and easy, the perfect isolation of a house from its associated sewer, if not practically impossible, is one of more than ordinary difficulty.

Examine the character and quality of the subsidiary sewers of London, with their faulty lines and gradients, and bad materials imperfectly connected with the houses along their course. Houses hurriedly and badly built on yielding foundations cannot be effectively or permanently sewered, and disjointed pipes readily afford the means of sewage saturation in foundation basements, if not the upper walls, of a large proportion of the "jerry built" dwellings of a London suburb. The house so circumstanced may be for a time regarded as less liable to the entrance of sewer-gas, because its virulence is absorbed in the soil and porous materials of which it is constructed, although in the long run it must essentially become a "diseased house."

There are, unfortunately for the London householder, none of the favourable conditions attached to his case which secure for the citizen of Edinburgh the advantages of a Sanitary Protection Society; and which, in the interest of public safety, has been extended to the metropolitan house-dweller. There are obstacles of a formidable nature to be encountered; not the least of which consist of the fragile structural character of the house itself, which would, in too many cases, be incompetent to withstand the disturbing influence of the necessary works to ensure its sanitary perfection. The machinery of remedy offered by the new Sanitary Society, is quite voluntary, and may, we trust, exert some beneficial influence in dealing with favourably-circumstanced cases of an exceptional character. We are not hopeful, however, of seeing much improvement realised by its exertions, for the evil is too deep-rooted for private enterprise to overcome or remedy. In the direction of guaranteeing sanitary perfection in newly-built houses, there would be better prospects of success, for a dwelling so circumstanced would secure a rental higher even than the extra cost required for its invulnerability against disease.

In the absence of sufficient controlling authority London is allowed to extend itself in all directions, by the building of new houses, many of which, under proper challenge, would not be allowed to be built. There is a lamentable want of accord all round on this vital question, notwithstanding the abundance of remedial authorities, which would have but little employment or attention bestowed upon them, if the necessary primary measures of prevention were fairly considered and insisted upon.

Apart from what may be termed foreign or external danger, produced by the causes we have referred to, there are domestic and internal sources of diseases built with the house, and like the ailments of a helpless child, inheriting parental taints, may be regarded as practically incurable. Walls (placed on manure-charged soil) composed of bricks, competent to absorb in many cases their own weight of moisture, and jointed with mortar produced from road-sweepings and sometimes worse; timber, which if not primarily defective, speedily from its position becomes rotten, and walls plastered with porous and spongy materials, which have their surfaces covered with poisonous papers stuck on with vegetable paste, which soon engenders a fungus growth capable of destructive and malignant influences; the carpets, curtains, and indeed, every item of the furniture of such a house, and the clothing of its inhabitants, are, in themselves, calculated to create disease, without the supplemental danger of sewage-gas. Absence of ventilating appliances intensifies the dangers arising from the conjunction of so many formidable and, under the circumstances, uncontrollable evils. The windows and doors are *fortunately* not capable of being hermetically closed, which should be regarded as a signal advantage, for it permits of some degree of relief, by the entrance of air in and through this dwelling of undoubtedly "shoddy" surroundings.

London and its doings is looked upon by provincial cities and towns as a model for imitation, and in the matter of drainage we fear the lesson has been read too slavishly, leading to the general adoption of sewage disposal into sea or river outlets. What has been done in the Metropolis is considered a guide as to what should be done elsewhere, and so main drains, and wasteful and dangerous water outfalls, have become fashionable. Look, say the servile imitators of a vicious system, at the main drainage of London: it cost millions, and conveys away, in the most perfect manner, all the waste of so great a city. The bill for all this supposed comfort has not yet been settled, for suffering, disease, and death are still sending in their ever-recurring claims, which must be met, and while they continue to be presented, they record the incontrovertible fact that the source of their origin is due to a lamentable infringement and disregard of Nature's laws.

SCOTLAND IN EARLY CHRISTIAN TIMES.*

THE Rhind lectures in archæology, delivered in 1879 by Mr. Joseph Anderson, Keeper of the National Museum of the Antiquaries of Scotland, have been printed and published in a handsomely got-up octavo volume. Mr. Anderson has given the lectures as they were delivered, with the addition of details and footnotes, and the interest and value of the work are greatly enhanced by the excellent engravings of structural remains, plans, and relics, given in the text, which have been collected from various sources. The woodcuts of plans and characteristics of ancient churches, for which the author is indebted to Mr. Thomas S. Muir, are of particular value to the student in this branch of British archæology, and we are enabled, by permission of Mr. Douglas, the publisher, to reproduce two of the most striking examples. Mr. Anderson's first lecture is one of the most successful attempts we have seen to place archæology on a scientific basis. The subject is handled in a thoroughly philosophic spirit, beginning with the examination of the materials found within a particular area or geographical limit, and next examining those existing within neighbouring areas, for the purposes of comparison, and the establishment of relationships and types. In this way Mr. Anderson classes the materials in a given area under two heads—a "principal group," embracing all types and relics that are indigenous, and "derived groups" of types not indigenous, imported from other areas. Even in the principal groups of relics, subordinate groups may be met with, characterised by differentiation of types in material, form, &c., due to different stages of progress. The author follows Dr. Arthur Mitchell, the former lecturer, in some of his conclusions, as, for example, in showing the connection between prehistoric and existing man, and in applying the same method of investigation. In Scotland, as in other countries, the three stages of progress popularly known as the Ages of Stone, Bronze, and Iron are to be met with, though it does not follow these ages are necessarily true of all areas in their sequence; and it is also necessary to bear in mind the lecturer's statement that archæology has no dates and can give no periods that can be expressed in chronological terms. The points established by the author may be summarised as follows:—(1) That archæology is the study of phenomena which differ in different areas; (2) that the great question in every area is, What are the facts? (3) that the answer to this question in respect to Scotland can only be obtained by an exhaustive collection of the materials from the whole country; (4) that such a completely representative collection of materials implies a national effort; (5) that while this is a necessity of science, it is also an object worthy of a national effort, because it is characteristic of all educated communities that they are careful of their scientific materials; (6) that the peculiar nature of these materials as the only revealers of the growth of culture and civilisation of a nation require a speedy and national effort to secure.

The most important part architecturally of the volume is the discussion on the sequence of types of the earlier remains of the Early Celtic Church. Sweeping away

* Scotland in Early Christian Times. By Joseph Anderson, Keeper of the National Museum of the Antiquaries of Scotland. Edinburgh: D. Douglas.

all structures which are known to be 12th century or later, the author takes the remainder, and endeavours to classify the specimens.

In most of these examples no moulding, ornament, or distinctive detail is to be seen that is met with in architectural books. In this residue we find some buildings earlier, some later, than others; it is possible the earlier type may have survived longer in some places, or there may be some places where the same type was never superseded by a later type; but in dealing with classes this uncertainty as to age does not disturb the sequence of types. Mr. Anderson, proceeding on these lines, instances two classes of structural types: churches with a nave and chancel, and churches that are simple oblongs—a single chamber. The former, as the more complex, is the later, though it is to be found passing from rudeness of style and construction, up to the more elegant Norman manner. There are "chancelled churches built of unhewn stones, but none built without mortar." On the other hand, says the author, "the single-chambered type of church, which never rises to the dignity of the Norman edifice, can be traced backwards by a series of gradations of

CHURCH OF ST. REGULUS, ST. ANDREW'S.

style and construction, into a type which is truly primitive, and corresponds in all its characteristics with the type of the earliest churches in Ireland, from which our Christian institutions, as ultimately established, were derived." No one will for a moment hesitate to conclude that the single-chambered form is the older of the two, that it goes back farther than the chancel type, though a specimen of the former may be found that is later in date than one built in the latter form. The precise date of any specimen is undeterminable. Our first illustration represents the church of St. Regulus, St. Andrew's, a structure of an exceptional kind in its features. Sir Gilbert Scott imagined it to be anterior to the introduction of Norman architecture into England, and remarks that it is of parallel character to Cormac's chapel at Cashel, one of the latest of the old Irish churches. The latter is of the 12th century, so that, as remarks the author, the date assignable to St. Regulus "would be somewhere within the limits of three centuries." "St. Regulus belongs to the most advanced type of chancelled churches, consisting of nave, chancel, and apse; and though it is the only example of this advanced type which is of unassigned date in Scotland, its typical form links it with the group of 12th-century churches." The round-towered church on the island of Egilsay illustrated is a remarkable instance. It has a nave and chancel, but also an exceptional feature—a round tower at the west end. The masonry is irregularly coursed, and of various-sized stones; the tower is of smaller stones, unhewn, and fitted to the round, and had a conical stone roof, though the latter feature is now absent. There is no window at the east end; the openings are small. Proceeding to discuss the significance of the round tower, the author compares it with two other peculiar towers in Scotland, one at Brechin, in Forfarshire, and the other at Abernethy, in Perthshire; both circular and slightly tapering but isolated structures. That at Brechin has an octagonal spirelet, and is divided into seven stages of unequal heights; the openings have inclined sides. The subjoined illustration shows the doorway of this

DOORWAY OF ROUND TOWER OF BRECHIN.

interesting tower. It faces the west, with inclined jambs, and is composed only of four stones, the sill and jambs being of the whole thickness of the walls. As will be seen, the architraves are enriched by two rows of pellets; over the arch is a carving of the Crucifixion, and raised panels, with figures habited as ecclesiastics are represented on the jambs. "One bears a pastoral staff, of the form peculiar to the early Celtic Church, having a curved head, resembling that of a walking-stick. The other bears a book on his breast, and carries a cross-headed or Tau-staff, which is of exceedingly rare occurrence, either in this country or any other." The Abernethy tower is very similar; the stones are dressed to the curve, and have horizontal and vertical joints, and it is evident both belong to the same type and always stood alone. Mr. Anderson next describes and illustrates the round tower at Devenish, in Ireland, and attempts to show that the two specimens we have instanced were derived from the same area as the Irish round towers of which that of Devenish is another specimen. There is no doubt the identity of type is made out, the features in all three being similar. We must, therefore, look to the principal area or group for evidence of the origin and purpose of these structures, and these have been summarised from Dr. Petrie's well-known work. The whole period of this type in Ireland lies between the end of the 9th and the beginning of the 12th century, and Egilsay church is shown to be the type that comes closest to the 12th-century church.

Passing from the chancelled to the single-chambered structures frequent on the western side of Scotland, a few remarkable instances are given, as in the plan (illustrated) of Teampull Cholumchille, in Benbecula, where the chancel has been added; and Mr. Anderson shows that there are two varieties of this type, one which passes into the chancel type, and one which does not. The latter primitive form has one chamber, one doorway, and one window, all of the smallest dimensions; of this kind some are built with lime, others without any binding material. The cell at Inchcolm is one of those illustrated; it is roofed with stone, the plan is not a parallelogram, but irregular; it measures 16ft. in centre of floor in length by 6ft. 3in. at the east end, and 4ft. 9in. at the west; the walls are about 3ft. think, and the arched masonry of roof and doorway are of the roughest description, the latter having overlapping stones for its inner head. A still more primitive form is described in the third lecture, where this simple form is traced through other gradations till we get a roughly-piled heap of stones formed into oblong and beehive-shaped cells, linking the Christian structures to types which go back into Pagan times. We have only room to say this lecture is profusely illustrated by woodcuts of plans and views of these island monasteries, as the group of structures on St. Michael's Rock, an island near the coast of Kerry, others on High Island, on the coast of Connemara, of double bee-hive cells, and other peculiar groups of structures of irregular

shapes. Many of these remains exist as groups comprising one or more churches in association with monastic dwellings of bee-hive shape, inclosed within a cashel or rampart of uncemented stones. The churches have ususally a west doorway and an east window. We have thus a series of structures in ascending order, beginning from the simple type of edifice of small size, and rude construction, and one chamber, a door, and a window. The next type consists of a nave and chancel in which the chancel is not bonded into the nave, but forming a transitional link between the single and double-chambered structure; another form in which there is no chancel-arch, the opening between being flat-headed with inclined jambs; another "variety in which there is no chancel-arch proper, the end of the barrel-vault of chancel opening directly into nave;" and lastly, a variety with the chancel-arch fully developed, and appearing to join with the 12th-century building. The author says, "We can also see that the earliest group of these remains is an extension from the great group of monastic remains in Ireland, characterised by an aggregation of circular uncemented beehive-roofed cells round a small oratory or church, and that the second group is also an extension of the Irish style of small churches unconnected with monastic buildings." He points out, however, that this early form of church, while partaking of the constructive features of Pagan buildings, among which it first appears, differs from them in the regularity and plan, in the east window, and its platform or altar.

Mr. Anderson, in drawing conclusions from the rudeness of the features of these remains, does not think they necessarily imply want of capacity or culture in the people who built them, and he further denies that the highest expression of a people's culture is always to be found in their architecture. In the concluding lectures, to which it would be impossible for us to refer, the author proceeds to examine various relics that are still extant of the Early Celtic Church. Among these the manuscripts form the most interesting features, as they were written and illuminated by men who lived in these primitive dwellings, and used the early types of churches. The illustrations of ancient Celtic ornament are very interesting, and the reader will find numerous illustrations of remarkable and elaborately decorated bells, crosses, and reliquaries, many exhibiting instances of refined Celtic interlacing and ornament. The work has a good index, and is one of the most readable and scientific treatises on the archæology of Scotland we possess, and we cordially recommend it as such to our readers.

THE WATER QUESTION.—V.

WHEN the outfalls of drainage are not directly into the sea, but into a tidal river, the great point for drainage, and also for the prevention of floods, and, indeed, for the conservancy of the river generally, is the lowering of the low-water level in the tideway, by removing shoals and other obstructions to the flow of tidal water, and this is at the same time conducive to the interests of the navigation of the river. Sometimes it has been said that the interests of drainage and navigation are necessarily antagonistic, the one requiring that the water be lowered, and the other that it be kept up; but a consideration of the circumstances of a tidal river will show that that is not so, but that the interests of both are served at the same time and by the same work, and that by due observation of the tidal actions of a river, the flow of water can be so regulated as to conduce greatly to its proper conservancy for the purposes of both agriculture and commerce.

A spring-tide is an increasing tide, rising to its highest level once a fortnight, and taking its place in the economy of nature on alternate weeks with the neap tide. These are the ordinary springs; but twice a year, at the times of equinox, the tides rise extraordinarily high. It is, however, the action of the ordinary spring-tides which governs river works chiefly.

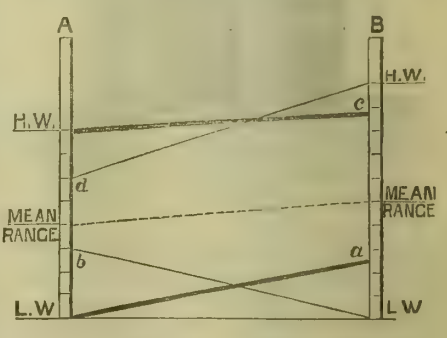
The downward flow of fresh water in every main river meets a body of sea-water coming up twice a day; the tidal water is the stronger at the first; but having received its initial impulse from the tidal wave of the ocean, that is all the force it has; and, not being, like the force of the downward flow, continuous, its force is gradually lost as it proceeds up the river-course. The fresh water opposes the passage of the tidal water, checks its speed and progress, and, together with the resistance of the bed and banks, and other obstructions, brings it to a standstill, at a distance from the mouth of the river all the shorter the greater the obstructions are; and, conversely, at a distance all the greater, the less the obstructions are. In passing up a river the tidal water meets three forms of resistance: (1) the force of gravity, against which it is acting in ascending the river; (2) the resistance of the bed and banks and the obstructions placed in its way, and (3) the resistance of the downward flow of fresh water; all of which, in the aggregate, bring it to a standstill sooner or later, *i.e.*, in a shorter or longer distance.

If there were no downward flow of fresh water for the tidal wave to meet with—if the river were empty—the resistances to the passage of the body of tidal water would be those of the bed and banks and the vertical height to which it would be raised, which together would bring it to a standstill of themselves; but in such a channel the tidal water would run farther, and its speed would be greater than it is in actual cases where it is met by a body of fresh water coming down the river, and the removal of obstructions in the tideway, as, for instance, shoals and unnecessarily wide piers of bridges, facilitates the passage upwards of the tidal water; and, of course, the more water goes up the river, the more must come down again to the sea, tending by its more powerful action on the bed of the river to deepen it and reduce the level of low water, while it does not at the same time reduce the level of high water, but rather tends to maintain and to increase that height, thus causing a greater range of tide. It might seem, perhaps, on a casual view, that lowering the bed of a tidal river and the low water level, in the middle or upper portions of the tideway, would have the effect of lowering the water level altogether, and that the tide would not mark so high; but if we consider the following circumstances it will appear that that is not so:—At the time of low water at the mouth of the river, and when the flood-tide begins to make and to set inwards, the water at any given point of the river's course has not yet fallen to its low-water mark there; it continues falling, while the water at the mouth of the river is rising. By the time it has fallen to its low-water mark, the tide has risen at the mouth of the river to a certain height, whereby a slope of the surface downwards from the sea is produced, and, the water continuing to rise there, increases the cross-sectional area of the waterway and impels a greater volume of water into the river the greater the difference of those two levels is, combined with the cross-sectional area of the waterway. The volume of water which will enter a river in any tide marking a given height, depends upon the inclination of the surface of the water downwards from the sea, as one element. This is greater at the first of the flood than afterwards; but it is not at the first—say in the first quarter of its rise—that the greatest quantity per hour passes, although the surface inclination may be greater during the early part of the flood tide than it is during the later part, for the volume depends also upon the depth, and as this increases faster in ratio than the inclination diminishes, the time of greatest flow is at the moment when these two elements together produce the greatest effect. The height of a tide at the mouth of a river is absolute and beyond control; but the height of low water at any point on a river's course can be altered, and, by lowering it, the difference of level between it and the water at the mouth of the river is increased, and so a greater volume of tidal water may be induced to enter the river, and as more goes up, more will come down, scouring the river's bed; and, curiously enough, these causes and their effects are interchangeable; a large body of tidal water cannot enter the river unless the low-water higher up be maintained low, and it cannot be so maintained unless a large body of tidal water be admitted into the upper portions of the river, so as to scour the bed on its return to the sea on the ebb tide. The volume of a tidal wave considered in this way is a comparative one; the actual volume is dependent on the width and depth of the tidal entrance of the river and on the cross-sectional area of the tideway and its hydraulic mean depth combined with the velocity of the current due to the inclination of its surface. Upon ascertaining each of these elements, which are subjects of measurement and observation, the actual volume may be ascertained.

Where the rise of the tidal wave is unobstructed, it rises and falls in equal times, six hours flood and six hours ebb, by tidal time, or 6·2 hours of solar time; but when it advances up a river and meets obstructions of various kinds, including the downward current of fresh water, it does not continue rising so long, but may come to rest at the top of the tide in five hours, and occupy seven hours in ebbing out, although, except for the volume of fresh water in the river, the tide water itself would probably ebb out in five hours or less, but combined with the fresh water of the river, they together may occupy seven hours in running down to low-water mark, according to the configuration of the channel.

The state of the tide at the same instant of time at two places on a river may be illustrated by a diagram.

Let the station A be at the mouth of the



river, and the station B at some point higher up. When it is low water at A, the water at B is at the mark *a* on the gauge. By the time it has fallen to its low-water mark there, it has risen at A to the height *b* on that gauge. Continuing to rise at A, it attains high water, and at the same instant it stands at B up to the height *c*. Continuing to rise at B, it attains high water, by which time the surface at A has fallen to the level *d* on the gauge.

The essential observations, therefore, are four—viz.: 1st, L.W. and its time at station A, and at the same time, by chronometers of identical adjustment, the height *a* on the gauge at station B. 2nd, L.W. at station

B, and at the same time the height *b* on the gauge at station A. 3rd, H.W. and its time at station A, and at the same time the height *c* on the gauge at station B. 4th, H.W. and its time at station B, and the height *d* at the same time on the gauge at station A.

The volume of water contained between the two surfaces of the river, represented by the two black lines on the diagram, is the volume of tidal water which runs into the space between the two stations A and B during the flood tide, and by dividing this quantity by the duration of flood and by the area of cross-section, the probable mean velocity of the current may be found, and by adding one-fifth or one fourth to the mean, it will indicate the probable maximum velocity at the surface.

A certain volume of water having entered the river from the ocean, and being possessed of a certain momentum, from the considerations above set forth, that momentum is gradually absorbed by contact with things in its way, whether they be the natural bed and shores of the river, shoals over which it must pass, or blank obstructions such as piles and piers of bridges, the aggregate of all which make up a sufficient resistance to absorb the force with which the tidal wave was endowed at its origin; and the fewer these are in number or the less the obstruction of each, the farther will the tidal water pass up the river before it is brought to rest; and, also, the less the aggregate obstruction the higher it will rise, within certain limits; for if in its passage the obstructions are not sufficient to absorb its strength, it expends the remaining portion in heaping itself up vertically; and this takes place with greater effect when the width of the channel gradually diminishes from its mouth upwards, for, having a wide mouth and admitting a large body of water with a great momentum of force, it rises vertically to dispose of itself as it ascends the channel. There are several instances of this; at the mouth of the Bristol Channel the range of tide is not more than 13ft., but at King Road, near the mouth of the Avon, it is 40ft., at ordinary spring tides, and at the mouth of the Wye, at Chepstow, greater still.

With regard to the downward flow of fresh-water floods in respect of increase in the height of high-water mark at such times, it may be said that the mouth of a river can be but full, and if there were no fresh water in the river, it would be wholly filled with sea-water—the source of the tidal wave, the ocean, being unlimited in magnitude—and this tidal water would run up the river and rise as high at any place as if there were no fresh water coming down; but the greater the volume of fresh water the higher stands the low-water level in the river, while the height of the top of the tide at the river's mouth is not correspondingly raised, and the slope of the surface of the tidal water downwards from the sea being reduced, less water comes in, and the quantity of tidal water admitted is less or more, as there is more or less fresh water in the river; thus the quantity of tidal water admitted into a river at each tide is regulated automatically. The first practical operation is to dredge and remove shoals and other obstructions to the flow of tidal water, after which the action becomes one of nature, more water flowing into the upper portion of the tideway, which, on its return to the sea, makes for itself a sufficient waterway.

CONSISTENT CONSTRUCTION.

ONE of the many inconsistencies committed by the modern architect is that of introducing a thing which really contributes nothing to the strength of a building, but is merely added to give an ostensible effect. Take for an example the use of the arch, so much employed in modern building as to almost make one believe it cannot be done without. In a number of cases it is absolutely essential as a constructive expedient, and in these there is nothing whatever to urge against its employment externally, especially if we are to take the sound advice laid down by one school of architects, and lately by Mr. Street in his Royal Academy lectures, that the external form should always be a translation of the internal structure. That it is so generally is very far from being the case; not that we wish to defend the doctrine to some of the extreme conclusions to which it may be pushed, as in that case, we should probably have very little external architecture at all; but the maxim at least is a wholesome one, as it gives no room for purposeless and counterfeit construction. We find the arch used in an infinite number of cases where it is quite certain the lintel would be better adapted and more economical. We might take, for instance, a row of private houses or villas. Everyone knows that an arched window-head is awkward internally; it has to appear as a sham outside, and its circumscribed space to be carved or filled up in some ridiculous manner; on the inside it either does not appear at all, or when it does it has to be filled by painted glass, as no sash or casement can be made to fit it properly. And yet it continues to be the favourite resort of architects and builders whenever appearance is to be studied. We may often see in a block of new offices one story with square-headed windows, and another with arched apertures, or a story of flat arches and another of pointed shape. If we reflected a little we might doubt the wisdom of the arrangement, and discover that a different order in their use would have been more judicious. It is too apparent that the mixture of arches and straight heads has been the result of fancy, and not of discretion.

But there is another foible of the modern designer more reprehensible—a superfluous use of features not warranted, and only making a profession of strength; we mean the employment of the arch above the lintel. Here we have one element of architecture evolved from a system of construction which expressed itself in every form of building added to another, which in like manner sufficed to answer every purpose of covering an opening. The modern architect inherits them both, and so he thinks he may use them together whenever he is so minded. The manner in which the arch and lintel are combined is often offensive to good taste. It is not uncommon to see buildings with narrow openings, these being covered first by a stone lintel, or what in many cases is a mere counterfeit of one, having a wooden lintel or rough arch behind, and above this a visible arch of masonry or brickwork. Next to it may be a wider opening covered only by an arch, or simply by a lintel, and we wonder why such apparently superfluous means should be expended over the narrow aperture, when for the wider opening the single feature is considered sufficient. In many of these cases the weight of wall to carry above the opening is comparatively trifling, and the lintel quite adequate; but the superposed arch (as a discharging arch) seems only admissible over wide openings where the wall to be carried is considerable. Where large blocks of stone can be obtained, the use of the arch above seems to be a useless piece of pretence—a kind of absurd redundancy or tautology, and as such to be avoided by every architect who has any wish to employ with economy and effectiveness the expedients at his disposal.

We might ask, If iron is stronger than stone, why use the weaker material as the show material, reserving the actual work for the concealed ironwork? The answer will be doubtless: "We prefer stone, because it has a more massive effect than iron." But it is not a satisfactory reply, for, as we have hinted, it may be used, as in the case of a lintel, only on the outside of a wall placed on its edge, but of such a shallow depth that it would not support a fraction of the weight intended to be carried by the concealed timber or iron behind it. For a similar reason we may ask, Why place an arch over a lintel if one is amply sufficient to discharge all the weight? It is too contradictory to one's sense of proportionate strength to allow that both are necessary; but it is this kind of sham that appeals to a popular instinct. Then there are lintels which really carry no weight, or are relieved of it by a hidden arch behind them. This is equally repugnant to good taste and truthfulness, though it is very often followed. What we say is, that if lintels are the best for our purpose, why not boldly use them? If we cannot get stone of sufficient dimensions, let us employ lintels of Portland cement concrete. If our materials are brick, we can use the arch to discharge a dead weight over our lintels; but let us be consistent in not using both where one is visibly sufficient, and where both would only appear to be a substitute for thoughtful construction and design, and provoke one to critical comparison. Even so pronounced an advocate of the arch as Mr. Street, said the other day, "If you have such a magnificent material that you can obtain it in masses of sufficient bulk, I can conceive no reason for objecting to the employment of trabeated systems of architecture. The vast bulk of the horizontal block or lintel is in itself impressive; and if it rests upon blocks of corresponding magnificence in the shape of monolithic columns, there are few modes by which the imagination can be more surely excited." It was pointed out, however, that what may be impressive in such a case may disclose a weakness where the materials are small, like brick, and draw attention to some unseen mode of holding the work together. A constructed lintel, or a trussed girder, may be a useful method of carrying walls instead of arches in some circumstances; but it is certainly one which cannot be honestly or conscientiously reconciled with a truthful system of architecture.

ROYAL ACADEMY LECTURES ON ARCHITECTURE.*

THE DEVELOPMENT OF STYLES.

IT is not very difficult to connect this Syrian school with buildings in Europe. It is improbable that a flourishing province of the empire should keep entirely to itself such remarkable powers. M. de Vogüé gives some examples of construction with parallel arches covered with flagstones, such as the baths of Diana, at Nismes, an arch of the bridge at Narni, and a corridor in the arena of Arles. He asserts also that the tomb of Theodoric at Ravenna, built about 500 A.D., is really so akin to them in all its details of ornament and construction, that to him it seemed to be almost a Syrian work. And it certainly seems possible to trace a distinct influence of these Syrian buildings on not a few of the Romanesque buildings of the eleventh and twelth centuries in the south of France, throughout the Rhine provinces, and in the east of Spain. The Syrian buildings, dating mainly from the fifth, sixth, and seventh centuries, must at that time have been seen by many in a perfect condition, and were so far in advance of European works of the same age as to make it certain that they would find imitators, who, however, with none but Roman works and traditions before them in their own country, would be likely, as a rule, to graft some of their features on to their own buildings without wholly abandoning the style of the latter. Doubtless the influence of these Syrian Byzantine architects was largely felt in the Holy Land; and it is incontestable that the influence of the Holy Land,—and particularly of the buildings in Jerusalem,—on

* By George Edmund Street, R.A. No. 3, delivered Monday, Feb. 21, 1881. (Concluded from p. 289.)

European art was equally great, and too remarkable to be passed over. It was of a twofold kind. Crusaders and pilgrims visited the holy places, and returned knowing somewhat of an art different from their own. Then wherever they formed communities or carried on trade in the East, they erected churches and other buildings for their own use and in their own style, modified by that of the country.

The Church of the Holy Sepulchre has been, as you all know, I dare say, a subject of much contention. But hardly any one now believes that there is any room for doubt as to its authenticity and antiquity; and to-night, at any rate, I must speak to you as though there were none. The church, as we now see it, is a collection of additions made from time to time to the original church built by Constantine. This was probably a great basilica, with a long nave and double aisles and transepts: West of these a circular building open to the air in the centre,—very much as in the church of Kalat Sem'an,—where was a shrine over the sepulchre. This central central space was divided from the surrounding aisle by a range of piers and columns. In the outer wall of the aisle were three circular projections or chapels. Here we have a most interesting plan, and one of which the outer wall still remains. At the latest it can hardly be a later work than the sixth century, but I see no reason for doubting that it is really the work of Constantine, and though the arrangement is unlike anything that we know of in his time, it is just such a shape as might naturally grow out of the special requirements of the case. Unhappily, in a restoration after a fire in the early part of this century, so much damage was done to this part of the building that it is now a little difficult to realise how venerable it is. The alterations made at various times have been great. First of all the nave was burnt, and in its place was erected in A.D. 1130, a choir with an eastern chevet and a dome over the crossing. The western side of the transepts then abutted on the circular church round the sepulchre. The architecture of the whole of this later work was thoroughly European. It was the work either of French or Spanish architects, and it is most interesting to see the exterior of its apse giving back to Jerusalem exactly the same outline as had first of all been there devised. The outline is a specially common one in the centre of France, —a great circular apse with three chapels and spaces between them for windows.

Close to the Church of the Sepulchre are other churches,—St. Helena, St. Mary, and St. Mary of the Latins, all of them evidently built by Europeans in the twelfth and beginning of the thirteenth centuries. At Bethlehem is a church which is probably also of the date of Constantine. It is a great basilica, with transepts, double aisles, and wooden roofs above a clerestory. The transepts and choir all end in apses, and may well be compared with the little triapsal church at the cemetery of St. Calixtus in Rome, of about the same date. The interest of this church is that it shows us the plan of a Christian church found upon the Roman basilica before the Greeks had developed the construction of the dome. The Christians, when they had to choose between the form of a basilica and that of the ancient heathen temples, naturally chose the former. The old *cella* of the temple was narrow, dark, and meant only for the functions of the priest; whereas the Christian church had to be large, well-lighted, and open to the multitude, and this church at Bethlehem shows so clearly the way in which it was adapted to the purpose as to be well worth study. This is, indeed, a story of the ninth century which attributes this church to Justinian. It goes that when the architect who had been sent by him to build it returned to Constantinople, the emperor was so disgusted with his description of his work that he charged him first of all with malversation, and then finished by having him decapitated. This punishment has been suggested in our own day as a better mode of promoting good art than any other, and perhaps not very undeservedly. I fear, however, that there is no truth in the Justinian story, which only does credit to the originality of the narrator, Eutychius. Justinian's principal works are known by contemporary description. They were Sta. Sophia, St. John at Damascus, and the Church of the Presentation at Jerusalem. They were all varied in design. In the first everything was sacrificed to the dome; in the second and third, the dome and the basilica had been combined very much in the form in which they are seen throughout Germany and France down to the end of the twelfth century.

I have already told you how much Eastern art affected the art of the rest of Europe. But the Holy Sepulchre buildings had a singular influence. The religious interest in the site and history of the spot led men to wish to copy the elevation of the church, and, accordingly, we find a number of buildings avowedly intended to be repetitions of it. Perhaps the most curious of all these is the group of six churches founded at Bologna in 430, avowedly in imitation of the Holy Sepulchre. They are very small, and it is now difficult to see how they can be called copies, save in the one fact common to both of the cluster of churches in one group. A much closer imitation is the crypt of St. Benigue at Dijon. Here the outline was evidently most closely copied, and there was above it a similarly planned church with a double aisle round the centre, which was open to the sky. The people in the triforium galleries and on the floor were thus able to look down into the crypt, and in this way a vast number of pilgrims were able to be present at one time.

The various churches of the Templars all over Europe were, in the same way, rough copies of the Holy Sepulchre Church. The Temple Church, and the round churches at Cambridge, Northampton, and Maplestead, all have a round church at the west end, corresponding with Constantine's circular church, and the choir projecting to the east, just as the latter choir did at Jerusalem. So also have the Templars' Church at Segovia, and the fine church (not connected with the Templars) of St. Gereon, at Köln. In France the Church of Neuvy St. Sepulchre, built by Geoffrey, Viscount of Bourges, after a pilgrimage to the Holy Land, is not the only example of the same influence. The destroyed Church of the Temple in Paris, with its circular nave and long chancel, was probably the most beautiful there; though, on the whole, none can be found that excels our own Temple Church in this city, with which I hope all of you are well acquainted.

In Constantinople, at Jerusalem, and in Syria, we have had the work mainly of the period from the fourth to the eighth century. The next great epoch at which we might pause if time allowed is that which followed the coronation of Charles the Great, in the old and completely Romanesque Basilica of St. Peter, in the year 800. But it must suffice to say that constant, though generally hostile and warlike, intercourse with Italy was leading the Northern people to a more thorough realisation of what Roman art was than would have been possible from the study of the works which had been executed during the Roman occupation of their own countries. And it is clear that from this time began that stream of mixed Byzantine and Romanesque art which so steadily flowed for some two hundred years from the south northwards, and mainly on the two parallel lines of the Rhone to the centre of France, and the Rhine from the Alps through the centre of Germany.

The various influences which I have been describing, had been gradually forming a style which was well defined, greatly advanced in constructive art, and full of variety. At times, as you will have gathered, it was swayed by the Byzantine influence of Venice and the East, at times by more distinctly Roman influence, and sometimes by that of Arab art. But, on the whole, I incline to give much more weight to the Byzantine share in the work than it is usually the fashion to give. Charles the Great evidently copied San Vitale and SS. Sergius and Bacchus in his Minster at Aachen, and after its erection there grew up a series of magnificent churches in the Rhine country which had far more connection with the East in their plan and general design than with Rome. In England and in Normandy, on the other hand, the style is more properly called Romanesque than anywhere; for, from beginning to end, our buildings of the earliest period show no knowledge whatever of Byzantine art, and when compared with the coeval buildings of Italy, of Germany, or of the south and west of France, they illustrate an entirely different phase of development. It can hardly be denied that far more skill and science was shown in those days in the South than in the North. We have grand buildings, but their decorations are coarse and their plans rude, compared to those which are seen at Arles, at St. Gillies, at Poictiers, and elsewhere in countless French examples.

Undoubtedly, there was an architectural influence at work in Great Britain which was but little connected with Rome. The early British Church was closely connected with that of Ireland. There we still see remains of extremely early churches or oratories, wholly distinct in style from either English or French Romanesque, and the architectural origin of which it is most difficult to account for. One feature, which is, perhaps, the most remarkable, is the construction of doors and windows with their jambs inclined towards the head, in Classic fashion. This is never seen in England, nor, I believe, in France, and certainly suggests a separate knowledge of Egyptian and Greek detail. It is not a little remarkable that this feature is carried on as late as the 13th-century, and, as we shall see when we have to discuss our English architecture, it is from Ireland, probably, that we obtained our love for the square-ended churches which are so marked a feature in really English architecture, and so opposed to all the traditions of Roman and Byzantine art.

There is still something to be said about another potent foreign influence, which is seen in almost all early Italian buildings south of Rome. Few countries are blessed with a sea coast so extended in proportion to the population; and it is no matter for wonder, therefore, if the people were good sailors and good traders. No one can travel in those parts without finding features which are entirely new and unlike those in any other part of Europe. There is so great an infusion of an Arabic combined with a Greek element in both design and construction, that it is impossible to class the buildings with those erected under simply Roman influence. To the present day you may travel among villages and towns in Southern Italy where the houses are all covered with flat roofs, out of which small domes occasionally rise, and when you come to a church you will find that it has features entirely unlike any seen elsewhere in Europe. It may have a central dome adorned with intersecting arcades placed slightly in advance of the face of the wall; a tower pierced with lofty round-arched windows, with the openings either extremely stilted, or of horse-shoe shape; walls panelled with small pilasters at intervals, with lozenge-shaped panels of ornamental carving or inlaying placed below the arches which connect them. Arches are used for ornament only, as at Sta. Maria Ancona, where the whole façade is covered with arcades whose arches avowedly have nothing to do with the construction. It is difficult to explain in words the *bizarre* effect of these buildings. Their authors are to be looked for on the other side of the Mediterranean, but they affected, in some respects, the whole architecture of Italy, as, to mention one instance, the construction of pointed arches, in vast numbers of which the arch-stones or bricks are not made to radiate from the centre of the arch, being built with the same kind of feeling as in the Moorish arches in Spain, as, *e.g.*, in an arch at the Puerta del Sol, Toledo, which is, for the greater part of its size, not an arch at all; and which is of constant occurrence in all Spanish buildings erected under Moorish influence. The decoration, which is profuse, is wholly unlike real Romanesque work; and, as is usual in Arab work, it always has the look of being entirely used for the sake of its beauty and not for its utility, or as an ornament of the construction. Many of these features are found in the Greek churches of the same period, and it is natural, when we regard some passages in the history of the country, that such marks of foreign intercourse and influence should be seen. Down to the 11th century the Greek Emperor had his lieutenant or capitan at Bari. The country was, in turn, occupied by Normans, by Saracens, and by the German Emperors. But at heart, the population seems to have sympathised with Byzantine and Arab art far more than with Roman.

Down to the 12th century, and even later, the whole south of Italy, and a considerable portion of Spain, were, more or less, identified with Arab art, either by reason of conquests by the Arabs, or by the importation of Saracen mercenaries. To give an instance: I remember seeing at Lucera a magnificent castle, in which, even so late as A.D. 1230, Frederick II. kept his Saracen soldiers. He was not a very Christian

king, for, as his troops wanted a mosque, he converted the cathedral at Lucera into a mosque, turning the bishop out, and installing his Saracen mercenaries in his place!—a feat which made Dante condemn Frederick II. to purgatory.

The influence of the Moors upon the course of art in Spain is as remarkable as, but much better known than, the corresponding effect of the southern side of the Mediterranean on Italy. Here, in the earliest times, it was a point of honour with both Moor and Spaniard to build in his own style. But, as time wore on, and the Spaniard freed himself from the dominion which the Moors had exercised, the Moorish architects still remained in the country practising their national art until the time of the Inquisition, and each nation influenced the other. In the later Moorish work we see constantly a number of completely Gothic details introduced in a very picturesque fashion; and in the Christian buildings, from the end of the 12th century, we meet equally frequently with pretty bits of distinctly Moorish detail in the midst of what is otherwise the purest Gothic. And wherever the Spaniards used brick, as they did in a large part of the country from Toledo to Guadalajara, Saragoza, Calatayud, and Tarragona, the whole of it is a most interesting mixture of Moorish and Gothic, both in general design and detail.

Nowhere do we see more instances of the way in which architectural styles spread from one country to another than in the history of the Italian Republics. As an example, take the case of Genoa, which is a typical one, for there politics and trade, foreign conquest, mercenary warfare, and foreign travel, are features which meet us at every turn. The Crusades were utilised by its people for purposes of trade. They were among the greatest traders to the East from the time of the first Crusade to the fall of Acre, in 1291. They had, in many Eastern cities, their own streets, their own warehouses; and the riches of the East came, to a great extent, through their hands to Europe. They despatched vessels against the Saracens in the Balearic Isles and on the mainland of Spain, and obtained in return not only shiploads of booty, but also an annual Spanish tribute to the cathedral of San Lorenzo. Then, again, they had treaties with, and kept consuls at, Narbonne, Montpelier, Aiguemorte, and other Provençal towns. They went as far north as to the great fairs in Champagne, where they exchanged their goods with those of the manufacturers of Ypres, Bruges, and other northern towns; and they built larger ships expressly that they might carry their goods to the Hanse Towns, and even as far north as that singularly interesting trading depôt at Wisby in the Isle of Gothland. In the East they had consuls and warehouses at Trebizond and Kars, in Persia, and, above all, in Constantinople; and one result of their foreign connections is seen in a singular episode of the joint Venetian and Genoese occupation of Eastern cities in the thirteenth century. We are told that two marble columns from St. Sabbas, at Acre, were sent to Venice, and erected in front of St. Mark's in the Piazzetta, after the Venetians, in a hand-to-hand fight with the Genoese in the church, had burnt their warehouses, and compelled them to take refuge in Tyre. This fight was only too common an Italian incident, for, as you know, the Italian Republics showed no mercy to each other. Pisa fought with and ruined Amalfi as early as the twelfth century. In the thirteenth century the Genoese, led by Oberto d'Oria, conquered Pisa, in the great sea-fight, at Meloria, and after destroying the chains which guarded the mouth of the Arno, brought them home in triumph, and hung them over their gateways, where, until our own day, they have remained. A hundred years later Venice fought a duel to the death with Genoa, and what little power was left to the latter was ultimately destroyed by the Visconti of Milan. Each one of these contests ended in something added to the artistic possessions or developments of both conquered and conqueror.

In France, the most fruitful source of development must, no doubt, be looked for in the Crusades, in which she had so large a share. An illustration of the effect of the intercourse which they promoted is seen in the case of Eudes de Montreuil, a famous architect of the thirteenth century, who went to the Holy Land with St. Louis, and built the fortifications of Jaffa. Another French architect, Jousselin de Corvault, also went to the East with St. Louis, but the only record of his work there is that he invented divers instruments of war. But upon the origin and development of French architecture I shall have so much to say in another lecture that I need not detain you upon it now. My object has been this evening to show you how possible it is to follow the growth of styles of architecture, and I hope I have also shown you how much interest there is in such investigations. Unless we make them we shall always be ignorant of the real history of old buildings, and unable to follow the course of their developments.

We have traced the progress of our art in the South and East, where in those days all the progress was being made. We are ready to go more into detail now in the rest of Europe, where in its later stages the developments of architecture left the South far behind. We have seen the growth of the art up to the time of Charlemagne. From his time until the fall of the Holy Roman Empire with Frederick II., 450 years elapsed, and during all that time Germany and Italy had been practically one country under one sovereign. Hence evidence of their union meets us at every turn in the early churches of the two countries. At Pavia and in Milan we are in presence of the same art as at Mainz, Coblentz, and Köln. One illustration, and this of a singular kind, will suffice. The apse of such a building as the Baptistery at Gravidona, close to the southern slopes of the Alps, is distinctly founded on the apse of St. Mark's at Venice. You will see by the plan the ingenious creation of three little apses in the thickness of the wall of the principal apse. To any one who had planned, or seen the plan of such an apse, it might occur that a piercing for a window should be made of the same outline, and just such windows we do find in the early churches on the Rhine.

The minor changes and varieties in German round-arched buildings are too many and too great to allow of my mentioning them now, though not so great as they were in the various parts of France. In those days France was formed by a number of provinces, each practically distinct from the other, so we see as many styles as there are provinces. The whole South is fairly uniform; but if you compare Normandy with Poitou, or either with Aquitaine, Alsace, the Ile de France, Champagne, and Burgundy, you will find, in fact that the one thing common to all was the round arch, and a perfect freedom of developing whatever was required for convenience, for good construction, or for the demands of a different climate. I have left myself no time to show how this last requirement affected art. But when you consider that in the south of Europe a flat roof is the best covering, whilst in the north a steep one is a necessity; and that in the south a very small window is necessary, whilst in the north it can hardly be too large; you have two particulars which alone would account for an enormous change in style. They proceeded to modify and develop in a mode which was everywhere founded on common-sense, and varied, therefore in its developments in every country. This, indeed, is one of the great accomplishments to the architects of the twelfth and thirteenth centuries. The Greek architect had been, above all things, a worshipper of beauty for its own sake. A lovely line lost none of its loveliness for him by constant repetition. The Roman recognised the skill and taste of the Greek, and tried to copy his orders and his columns, forgetting that they were always the decorated features of a real construction. He treated architecture as an art which had nothing to do with building, and failed conspicuously in leaving anything that was very original, or much that was beautiful, behind him. The Byzantines took up the work, and to a great extent transformed it; but they inherited the old Greek idea of perfection, and spent ages in developing their designs. And then, in the eleventh century, came this new spirit, which made men suddenly conscious of the exceeding charm of variety, and of the power which the freeest use of the arch gave them for securing it. Their art was that of men who were devising everything that they did with a reason. They adapted themselves to the requirements of convenience with a novelty of resource and invention which is astonishing the more it is looked into. They tried to build so that their work should last for ever. Mortals themselves, they never dreamt of making any work temporary and weak. By the middle of the twelfth century, therefore, it need not surprise us that their work bore its proper fruit, and that, after having discovered the practical use and convenience of the pointed arch, they soon invented and perfected a new style consequent upon its use, which, in rapidty of development, variety of resource, and real beauty, soon eclipsed all that had gone before. But this style lies outside my proper subject to-night, and in my next lecture I shall hope to show you how it affected Italian art. In that country one of the completest of the round arched buildings was the cathedral at Pisa. If anywhere Roman influence should be felt, one would have supposed it would be there. But the Pisans were like their contemporaries the men of Genoa, of Amalfi, and of Venice,—resolute adventurers who went far afield,—and in A.D. 1050 they had made an expedition to Sicily. They had captured at sea a prize of extraordinary value, and they had taken Palermo from the Saracens who held it. Then, returning laden with their booty, their first and very pious idea was to build a magnificent cathedral, and so cosmopolitan were they, that they employed a Greek—Boschetto by name—as their architect. He built them certainly a magnificent church. But it was not Roman or Italian. It had the long ranges of columns of the basilica, but it had the Eastern dome, and in every detail throughout the work it is the Greek whose hand you see, and Byzantine architecture, not Romanesque, with some of the same flavour of Arabian art which we have been noticing in the more southern part of Italy. And it was under the shadow of its arcaded walls that the greatest architect of the thirteenth century was born and educated in his art.

It has been difficult to say anything like enough on my subject this evening. In all directions lines might be followed out far beyond what I have been able to attempt. But I am in hopes that I may have said enough to induce some of you at least to follow out these interesting subjects for yourselves. The course of art is like a stream with endless back currents and eddies, which interrupt us on our way. It takes us from Egypt to Greece, from Greece to Rome, thence to Grecian art again at Byzantium, to Syria and the Holy Land. Then it crosses again to Europe, taking possession of the south and west of France, and, joining two streams, one of mixed Byzantine and Roman from Ravenna and Venice, and the other of pure Romanesque from Rome, flows northward to the German Ocean. There these streams of art, rich in their combined developments, find another art establishing itself, founded upon an independent use of Roman work. At the same time, Moor and Christian are fighting for dear life in Spain, and wherever either plants his foot he builds in his own style, either in the most complete Moorish or in the severest Romanesque borrowed from his neighbours on the other side of the Pyrenees, but each showing occasional evidence in some part of the work of the influence of his enemy. In this progress of art it is difficult to say which has done most, the Church or the Sword. There had been a pause before what was supposed to be a fatal date, the year 1000. But when that was passed and the world had not come to an end, men breathed again, and began to build with renewed energy and enthusiasm. The circumstances of the age were all really in favour of the arts. For it is in countries which are establishing themselves, making their laws, cementing their polities, bringing their communities into order, that public spirit is at its highest point, and that art has its greatest opportunities and exercises the most fascination. In a highly-civilised state, where every one is satisfied, and there are no wars or rumours of wars, where life is easy, and men lazy and luxurious, it has a comparatively feeble influence.

In my succeeding lectures—having brought you, as it were, to the threshold of the thirteenth century—I hope to show you somewhat more in detail how the development worked out its course in Italy, in France, and in our own country. If we know so much we shall know almost enough, for in Germany and in Spain the distinctive art of the thirteenth century hardly ever existed. In Germany men were so proud of their early style that they troubled themselves as little as possible about any new one until the magnificence of an Amiens and a Beauvais forced them to an attempt at rivalry, only just completed, at Köln. And in Spain there was much the same enthusiasm for the earlier style, and when it was thought well to follow the new fashion it was

for the the most part by the hands of a Frenchman, and not of a Spainard, that the work was done.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A SPECIAL meeting of the Institute was held on Monday evening, when the following resolution was carried, *nem. con.*, on the motion of Mr. Whichcord, President, seconded by Mr. Charles Barry, Past-President:—"That By-laws XXV., XXIX., and LXX., in so far as they relate to the holding of the annual general meeting on the first Monday in May, be suspended; and that the annual general meeting for the current year be held on the second Monday in May, that is to say, the 9th May, 1881." Notice was given by Mr. Barry of his intention to propose that a special general meeting be summoned for the purpose of authorising the insertion in the By-laws XXV., XXIX., and LXX., after the words "first Monday in May," of the following: "or as near thereto as conveniently may be."

The "house list" of nominations for officers for the ensuing year of office, has just been issued by the Council as follows:—President, *Horace Jones, Vice-President. Vice-Presidents (three names to be returned), †Thomas Hayter Lewis, F.S.A., V.P.; †Ewan Christian, V.P.; †David Brandon, F.S.A., P.V.P. Ordinary members (fifteen names to be returned), Aitchison, G., B.A.; †Blomfield, A. W., M.A.; Brooks, J.; †Cates, A.; †Clarke, J., F.S.A., P.V.P.; †Currey, H., P.V.P.; Fowler, Charles; Fowler, James (Louth); †Gibson, J., P.V.P.; Gruning, E. A.; †Hansard, O.; †Honeyman, J. (Glasgow); †I'Anson, E., F.G.S., P.V.P.; †Knowles, J. T.; Paley, E. G. (Lancaster); Porter, F. W.; Smith, T. R.; St. Aubyn, J. P.; †Vulliamy, G., P.V.P.; †Waterhouse, A., A.R.A., P.V.P.; †Worthington, T. (Manchester). Honorary Secretary (one name to be returned), †John Macvicar Anderson, Hon. Secretary. Secretary (one name to be returned), †William Henry White, Secretary. Additional names for election, which must be proposed by two Fellows, must be sent to the Council on or before Saturday, the 9th April.

GENERAL CONFERENCE OF ARCHITECTS.

The Council of the Institute have approved the following arrangements for the approaching General Conference of Architects in London, namely:—

Friday, 6th May, 1881, 8 p.m. Opening Meeting of the Conference. Reception by the President and Council. Presidential Address

Saturday, 7th May, 11 a.m. Conference Second Meeting. Papers on "Quantities." 6.30 p.m. Institute Dinner.

Monday, 9th May. Visits to New Buildings, &c. 8 p.m. Annual General Meeting. Reports of Council, Election of Officers, Election of Board of Examiners under Metropolitan Building Act, &c.

Tuesday, 10th May. Visits to New Buildings, &c. 8 p.m. Conference Third Meeting. Discussion of the Papers on "Quantities."

Wednesday, 11th May, 11 a.m. Conference Fourth Meeting. Reports and Papers on "Architectural Competitions." 3 p.m. Conference Fifth Meeting. Discussion of the Papers on "Architectural Competitions." 8 p.m. Conference Sixth Meeting. Papers on some Subject of Artistic Character.

Thursday, 12th May. Visits to New Buildings, &c. 9 p.m. Conversazione.

ARCHITECTURAL ASSOCIATION.

THE fortnightly meeting of the Association was held on Friday evening, the President, Mr. E. C. Lee, in the chair. The following new members were elected:—Messrs. F. A. Hewer, W. Aston, C. A. Bovill, W. R. Hobson, H. A. Gregg, Bernard Dicksee, E. Hardy, W. Dewes, J. T. Muller, R. Guy, G. Hubbard, J. Hart, and T. W. Parkes. A vote of thanks was accorded to Messrs. H. Saxon Snell and Son, the architects of the new Marylebone Infirmary, and Mr. Eales announced that the next visit would be made on Saturday, the 26th (to-morrow), to Exeter Hall as remodelled from the plans of Mr. Alfred R. Pite. The President read the following letter, signed by 12 members of the association:—

"We, the undersigned members of the Architectural Association, desire that you will, at an early date, summon a special business meeting to consider and discuss the desirability of increasing the entrance fee. Taking into consideration the numerous advantages offered by the Association, and the additional inducement which the proposed studentship will present for new members to join our ranks, the present seems a favourable time for raising the entrance fee. We therefore propose that in Rule 17 the words 'One Guinea' shall be substituted for '10s. 6d.' It is not, however, intended that this alteration shall be made until the commencement of the next session."

The President added that the special meeting would be held on Friday, April 1st, at 7 p.m., and that afterwards Mr. Riddett would read a paper on "Settlements" in place of one he had previously promised on "Swimming Baths."

HOLLAND.

Mr. R. Phené Spiers read a paper descriptive of his visit last year to Holland, which we print *in extenso*, in the next column.

The President, in inviting discussion upon the paper, remarked that while there was much picturesqueness in Dutch architecture, there was a want of detail and finish, a crudeness of colour, and an inartisticness in the execution, which detracted from its value. It was certainly not the country which they would select for the holder of the new travelling studentship.

Mr. H. W. Brewer thought Mr. Spiers had not sufficiently taken into consideration the circumstances under which the vast and bare churches of Holland were built. They dated in the main from the 15th and 16th centuries—a period when there was a demand for large places of worship, but a disinclination to spend much upon them. The designers, therefore, unable to expend sums equal to those which had been employed in France or Germany, carried their new churches well above the surrounding large houses, but trusted to their height and proportions to give dignity; in many of these churches the only architectural detail was to be found in the tracery of windows. Taking into consideration their vast size and great simplicity, the effect of these churches was pleasing, and must have been more so when they were fitted up with the rich furniture now almost entirely destroyed. He had been rather surprised that Mr. Spiers had not referred to the hall of the Palace at the Hague, an apartment apparently about 180ft. long by 60ft. square; the roof must have been 100 years later than that of Westminster Hall, say of the middle of 13th century, but it was a good example of hammerbeam construction, very plainly treated. It was a question whether the designers of this roof visited England, or if our architects were indebted to it for inspiration. The domestic architecture of Holland was remarkably interesting and worthy of study. The Dutch greatly disliked picturesqueness, and lichens and mosses were hated from the very bottom of a Dutchman's heart. He proposed a vote of thanks to Mr. Spiers for his interesting paper.

Professor Kerr observed that Dutch architecture was characteristic of its circumstances of development. It was odd, eccentric; certainly—although Mr. Brewer did not seem to think so—picturesque; the detail was very suggestive; but the present fashion of following this Low Dutch style under the name of Queen Anne was, it was to be hoped, only a passing caprice of the popular fancy. We ought to make the best of the fashion for this plebeian style while it lasted, hoping that it would prove to be but the stepping-stone from the Gothic, which had had its day and gone out of favour, to the superior style of the Renaissance.

Mr. Blashill and Mr. Hilton Nash having spoken, the latter suggesting that much of the piquancy of the superior Dutch architecture, when compared to ours of similar character, was due to the smaller bricks (about 8in. by 4in. by 2in.) employed in Holland, the vote of thanks was put to the meeting and carried by acclamation.

Mr. Spiers, in acknowledging it, suggested that the name of Mr. Brewer should have been coupled with his own, for the series of beautiful water-colour drawings which that artist had lent for exhibition. With reference to Professor Kerr's observations on the Dutch origin of our Queen Anne style, he might say that on his return from his tour he found excellent reproductions of several of the quaint brick gables and podiments he had sketched in Holland, on the series of new schools erected by the London School Board.

HOLLAND.*

[WITH LITHOGRAPHIC ILLUSTRATIONS.]

WHEN asked to give a paper on some subject this session to the members of the Architectural Association, your secretary was anxious that I should qualify, in some respect, the simple heading I proposed "Holland," by adding "The Architecture of." I preferred, however, the one word for two reasons. First, it left me free to take up whatever branch of the subject I might deem most interesting; and secondly, I avoid lying myself open to the awkward position of the gentleman who undertook to read a paper on snakes in Iceland, and who, when he began to study his subject, found there were no snakes there. It has been contended by many that there is no architecture in Holland. The guide-gooks omit that general summary of the architectural features which generally forms the preface to their description of a country. Fergusson, in his "History of Modern Architecture," viz., of the Renaissance period, devotes one page only to it, and illustrates and speaks of only one building, the Town-hall of Amsterdam, one of the most pretentious and least satisfactory of any in Holland; and the only description I can find (and that after I had written this paper) which treats of the subject is one by Mr. Brewer, read to the Architectural Association in 1876, who described the cathedral of Bois-le-Duc and some other places in South Holland. This, at all events, leaves me a fair field to begin upon. I should wish it to be clearly understood, however, from the commencement, that because I shall attempt to treat the subject this evening, and, as far as lies in my power, endeavour to interest you in it, it by no means follows that I am prepared to advise any of the students of the Association to make Holland their camping-ground for their summer excursions. They possess in our own country and in the North of France much better material to cut their teeth upon, and it is only when they are of more mature age and experience that they should venture to visit and sketch in a country where what we call "Queen Anne" reigns supreme. The architecture may be divided broadly into five periods. 1st, that which belongs to the Mediæval epoch, which extends far into the 16th-century, and of which the cathedrals of Bois-le-Duc, Utrecht, and perhaps Haarlem; the towers of the churches at Dort, Delft, Leuwarden, Enkhuisen, and Rotterdam; the town-halls of Middleburg and Veer, the *waaghuis* of Deventer, and a few houses here and there may be taken as examples. 2nd. The work of the 17th-century, of which the town-halls at the Hague, Haarlem, Kampen, and Leyden; the *waaghuisen* or weighing-houses of Leuwarden, Hoorn, and Alkmaar; and the houses at Dort, Hoorn, Enkhuisen, Delft, and Middleburg offer an interesting series. 3rd. The architecture of the 18th-century, consisting principally of town-halls and houses of pretentious but uninteresting character, based on the French Louis XIV. style. 4th. The work of this 19th century, quite commonplace, and without very much to redeem its ugliness; and 5th, modern work. Of the last I have very little to say. I had no intention of reading a paper on Dutch architecture when I visited the country, and I did not happen to come across much of Mr. Cuyper's (the chief architect in Holland) work; I do not feel justified, therefore, in criticising what I saw. Roman Catholic churches seem to be almost the only modern buildings, and they were generally (those I saw) of a hard and monotonous effect, without any features to note or take interest in. In fact, it was only of the buildings of the first two classes that I made any drawings, and they alone seemed to offer suggestions in design. I propose, as on previous occasions, when I have lectured on similar subjects, not to attempt to take you with me on my tour, because to those who have not visited the country such description is difficult to follow; but to arrange my subject under the heads of the different classes of buildings. It may be as well, however, that I should put before you the line of my route. I went by way of Harwich to Rotterdam, thence to Dort, Delft, the Hague to Leyden by canal boat, back to the Hague, Gouda, Amsterdam, Alkmaar, Haarlem, Amsterdam, Purmerende, Hoorn,

* A Paper by R. Phené Spiers, F.R.I.B.A., read before the members of the Architectural Association, March 18, 1881.

* The Council explain that the senior Vice-President, Professor Lewis, having formally declined the Presidency for the ensuing year, Mr. Horace Jones, the Vice-President next in order of seniority, is therefore nominated.

† This dagger denotes Members of the existing Council.

Enkhuisen, Harlingen, Leuwarden, Zwolle, Kampen, Deventer, Zutphen, Arnheim, Utrecht, Bois-le-Duc, Middleburg, Zierikzee, Goes, and thence to Antwerp. There are many other places of interest I might have visited, especially more of those towns now called the "dead cities," from which the commerce has departed. But it was so difficult to obtain any information respecting then, or to put any trust in the guide-book, that I consider I did pretty well in the month I spent in the country.

The general aspect of Holland is very peculiar. As you journey by rail, or even by boat on a canal, the whole country lies beneath you, one mass of the richest verdure, dotted over by the black and white cattle which luxuriate thereon, and interrupted by long avenues of trees which line the borders of all the roads. The villages and houses dotted about are somewhat disappointing, in that you find little of the picturesqueness which abounds in our own English examples. They are all so neatly kept: the roofs in perfect order, the windows and woodwork all freshly painted, and in the brightest, not to say glaring, colours; the gardens and hedges carefully trimmed, and the palisading all so newly painted that the artist searches in vain for those beauties of colour which time and decay alone can give, and the architect fails to find any of those picturesque combinations of roof or wall in which almost every English village abounds. This want of picturesqueness in the houses, however, was in my case compensated for by the brilliant effects of light, as the sun is going down. Owing most probably to the rapid formation of dew in a country intersected everywhere by canals and ditches, and where continual irrigation of the whole surface is going on, the brilliance of the last rays of the sun seems to be diffused throughout the atmosphere, and the most splendid effects of light in the towns, as well as in the country, are the result. The first time I saw it at Dort I thought the street must be on fire, and it at once recalled those brilliant effects which one sees in the pictures of Cuyp, Both, and De Hooghe. Possibly it may not be the same all the year round. I happened to enjoy nearly a month of continual sunshine, and naturally, therefore, the vision of the sun-setting and the deposit of dew were every-day occurrences. I found the people very obliging and kind everywhere, their only defect, so far as I was concerned, being their inquisitiveness. If I only looked at a building, they began to look also; if I took out a note-book, I was surrounded; and when I sat down to draw, "Takener," "Takener," resounded on all sides, and it was with the utmost difficulty I could get a sight of the building I wanted to delineate. It was true they moved aside when pressed repeatedly to do so, but only to make room for others who, coming up to see what was the matter, took their place.

I shall divide my subject into three classes: first, the churches; secondly, the public buildings; and thirdly, the shops and warehouses, private buildings, villas, and farm buildings. I put the churches first, not because they are the most interesting, for with one or two exceptions they are the least, compared with other countries, but because it is convenient to adopt an order I have followed in other cases. Unfortunately, I have but few illustrations to put before you. I have selected two plans from M. Narjoux's book, "Notes of an Architect's Trip to the North-west of Europe"—the Groote Kerk of Rotterdam and of Amsterdam. The interior view of the former, also taken from M. Narjoux's work, will at once convey to your minds the poverty in the architecture of nearly all the churches in Holland. In the place of the stone vaulting which is necessary to complete the interior effect of the nave, we have a plain barrel vault in wood, with the plainest tie-beam and struts. When to this we add that the tracery of the windows is of the poorest and most meagre kind—generally in brick glazed with common window-glass—the whole of the stonework whitewashed, and a large enclosure blocking up the nave and side aisles, and extending sometimes into the transept, this enclosure rising sometimes 12ft. high to keep off the draughts from the congregation, the total absence of any ancient fittings, the choir desecrated, and its floor green and damp, all these give some idea of the depressing effects of religious architecture in Holland.

In one or two of the churches the iron or brass grilles in front of the choir, dating from the 17th or 18th century, are still to be found; and at Dort and Enkhuisen are some of the most beautifully-carved stalls (disused, of course) to be found out of Italy. It is said they were executed by Dutch artists; but, if so, their authors must have sojourned in Italy so long as to become thoroughly imbued with the Italian style. When I compare these stalls with those of Haarlem and Amsterdam, also very fine, but possessing the especial style of the Low Countries, I am constrained to believe that the artists of the stalls in the two first-named churches must have been Italian. I am in hopes it may be possible to obtain casts of these stalls at Dort and Enkhuisen for the museum at South Kensington. The more interesting churches of Holland are those of Bois-le-Duc, Utrecht, Goes, Kampen, and Haarlem. The last, built in 1442, is noticeable for the size of its choir, which has the same number of bays as the nave. Here the roof (also in wood) has been treated in a more architectural manner. It is possible that the Dutch architects, taking for their examples the vaulted cathedrals of France, had intended to reproduce the stone vaulting; but fearing the too great weight in a country where the foundations are necessarily treacherous, they changed their minds at the last moment, and devised these wooden roofs. It is much to be regretted they did not come over and study our English churches, and especially those in Norfolk and Suffolk, where they might have found examples of decorative roofs thoroughly in accord with the style, and realising the artistic harmony of the whole building. The aisles, I should say, are frequently vaulted in stone.

At Bois-le-Duc the cathedral has always remained Roman Catholic. The interior thereof has retained its original arrangement, and had it not been subjected some 30 years ago to restoration, would have retained most of its ancient fittings. These were, most of them, sold, and replaced by new ones of paltry character, and we are fortunate in possessing, at South Kensington, the magnificent marble jubé which once formed the inclosure to the choir. Mr. Brewer, in his paper in 1876, described the church in detail, so that there is no necessity for my saying more than that the cathedral is one of first-class magnitude, and worthy of comparison with French and English cathedrals. It is about 400ft. long, and consists of a nave of seven bays and double aisles, transept with aisles, choir of four bays, choir aisle, and a chevet, with seven radiating chapels, an extra chapel on the N. side, and an octagonal building, which Mr. Brewer suggests may have been a chapter-house. I did not visit Roermond, Breda, or Bergen-op-Zoom, to which Mr. Brewer refers; but the churches of Kampen and of Goes have both of them double aisles on each side of the nave. At Goes there are three apsidal terminations—the central one in the prolongation of the choir, the other two in the prolongation of the double aisle; at Zierikzee, only the central chapel is emphasised, the other two are marked by the line of the external wall of the chapels of nave and choir aisles being carried through. The Nieuwe Kerk, at Amsterdam, has seven chapels in the chevet, of which five are polygonal and two square. At Delft, the old church has apsidal terminations to aisles and choir.

I said, in the earlier portion of my paper, that I should scarcely be prepared to advise students to make Holland their camping-ground. I think I should make an exception in favour of Utrecht, where the cathedral and archiepiscopal museum would well repay a visit to that country. Unfortunately, only a portion of the cathedral remains—the transept, choir, chevet, and the western tower. The intermediate part, the nave, fell down in 1674, and was subsequently entirely cleared away.

The drawings of the ruins, as they remained some twenty years afterwards, are to be seen in the museum of the town-hall. The eastern end of the cathedral dates from 1254 to 1257; it is beautifully proportioned, the tracery of the windows and all the carving being French in character and excellent in design and execution; the height of the choir is 115 feet. On the south side of the choir is a fine cloister, now undergoing fairly careful restoration. The western tower, 338 feet high, is composed of three stories; the lower two square and in brick, and the upper one octagonal and in stone; it was formerly surmounted by a stone spire, which brought the height up to 364 feet. This reminds me that I have made no reference hitherto to the church towers of Holland, which are especially noteworthy. It is singular that in a country where the foundations were so little to be depended on, they should have ventured to raise such enormous and weighty structures; they trusted probably to the great thickness of walls, and their being tied in at various levels. In more than one case, however, and notably at Delft and Dort, the towers are considerably out of the upright. Besides those at Dort and Utrecht, of which I have here drawings, I am able to show you an old print of the tower of the church of Zierikzee, in South Holland, one of the most formidable structures ever conceived. Had it ever been completed it would have exceeded by over a hundred feet the height of the spires of the cathedral at Cologne. The print shows the tower as it was intended to be, and as actually built, with the church adjoining, from which it seems to have been detached, possibly owing to the fear that if it were to sink it might drag the church with it; the base of the tower measures about 76 feet, including buttresses. The church, as here shown, no longer exists, and has been replaced by a modern Palladian structure.

The most beautiful tower in Holland is that of St. Vitus at Leuwarden, a fifteenth-century structure of stone and brick of two colours. Doubtless time has mellowed the tones of the surface, but the introduction of yellow brick here acts as a sort of intermediary between the red brick and the stone, and is extremely happy in its effect, and worthy of imitation. The too-great difference in colour between brick and stone, especially when the latter is sparingly used, is in the tower of Dort, is always objectionable. When, however, a third colour somewhat between the two is introduced it acts as a harmoniser, and, to use a painter's phrase, "pulls the thing together." The base of this tower is 64ft., including the buttresses, which are 9ft. deep and 7ft. wide, so that you can get some idea of its size. Unfortunately, the church to which it was attached exists no longer. There are several other towers of note, such as those at Zwolle, Enkhuizen, and others, of which I have no large illustrations. The Nieuwe Kerk at Delft has a fine lofty tower with two stories, square on plan, and two above them octagonal and crowned with a spire. The tower close by, belonging to the town-hall, is also good; it has its bells hung outside the belfry windows—a peculiarity often found in Holland. At Gouda there is a very fine series of stained-glass windows (29 large and 13 small), executed between the years 1553 and 1606. The subjects are Scriptural, with the figures of saints and of the donors. They have, however, too much line-drawing in them to be perfectly satisfactory to my mind, and seem to bear the same relation to fine coloured glass as a coloured print would to an original picture. I ought also to call attention to two remarkable fonts in brass, one at Bois-le-Duc and the other at Zutphen. Of the former you can judge for yourselves from Mr. Brewer's drawing. At Zutphen the base is carried on six lions; the leg or stem of the font is smaller, and decorated with small figures in niches; and the cover is hexagonal, equally rich as, and somewhat similar to, the cover at Bois-le-Duc.

I come now to the public buildings. With the exception of Middleburg, the town-halls of Holland are far inferior to those of Belgium. A few of them, such as those at Gouda, Alkmaar, portions of Haarlem, at Veere, and Zierikzee, date from the fifteenth and sixteenth centuries, but are extremely simple; one of the richest façades, and typical of the picturesque though debased style of the seventeenth century, is the town-hall at Leyden. The town-hall at Middleburg, built in 1468 by Charles the Bold, presents a fine front of some 200 to 250ft., with lofty gables at each end of the main façade, which consists of ground and first floor with a lofty roof. The lower portion of the building is comparatively plain. The wall between the windows of the first floor is covered with canopies, with colossal statues of the Counts and Countesses of Flanders. In the centre, behind the main block, is a lofty tower with belfry. The style of the whole building is Flamboyant in character, with rich tracery in the windows, the walls above the windows of the first floor and in the gables above them being covered with rich blank tracery.

The older portion of the town-hall at Haarlem was originally the palace of the Counts of Hol-

land. Leading out of the picture-gallery is an ancient room with its fittings and furniture, of the seventeenth century, more or less uninjured, and this room and the court-room of the town-hall at Kampen are the most interesting specimens of interior decoration to be found in Holland. Round the lower portion of the former room runs a dado of about 9ft. high, in oak, considerably darkened by age, enriched with deep-sunk panels, Jacobean pilasters, and cornice; the walls above being simply white, with portraits in black ebony frames hung upon them, and ancient armour, blue and white china dishes, and flags. The roof is a pointed barrel vault in dark coloured wood, with a single truss, consisting of tie-beam and arch in centre of room, both tie-beam and arch being moulded and carved.

In the town-hall at Kampen there is a similar dado round the room—the lower portion brought out to form a seat, the upper portion decorated with detached Corinthian shafts and cornice complete, the spaces between the shafts having small arcades filled with inlaid wood stained in various patterns. Across the centre of the room, and the same height as the dado (about 8 or 9 feet), is a screen similarly decorated to the dado; the arcades in this case, however, being pierced. On the outer room side is a bar of wood, before which it is said the counsel used to plead, and hence the expression being "called to the Bar." I think it is more likely it was placed to keep the public off the screen, and that the counsel pleaded where he could be better heard, viz., in the inner room. In this inner room, at the further end, is a magnificent canopy over two seats, very much like the stalls of a cathedral, in which the judge and chief burgomaster sat. This seat, and a case or cupboard on the other side of the chimney-piece, are beautifully carved. The chimney-piece, which is of earlier date (A.D. 1543), is the finest in Holland, and will be best understood from my drawing. Here, as at Haarlem, the wall above the dado is white; there is a fine panelled ceiling in wood, the ribs of which have a peculiar ogee curve, of which I never remember to have seen an example before, and which gives a pleasing effect in the play of light and shade. These two rooms at Haarlem and Kampen may be taken as the types of the finest interiors in the national style of Holland. The wood panelling, now almost black with age, and the white wall above, present a powerful contrast, and give the cue for its subsequent decoration By the sides of the windows are green or red curtains; thay are of thin material, intended rather to break and diminish the light than to exclude it; these, when partially drawn, throw rays of bright colour on the white walls of the room, on which are hung portraits of rather sombre colour in black ebony frames, and brightly burnished armour. On the shelf formed by the cornice of the dado are placed specimens of the blue and white Japanese ware (which have been so much prized for their simple effects of colour by the Dutch for the last two hundred years, and have been so largely imported from Japan). Brass chandeliers and sconces and other metal utensils, furniture of rich inlaid work, and chairs and couches covered with embroidered Utrecht velvet, present an *ensemble* of rich deep colour, the effect of which must be seen to be thoroughly appreciated. The pictures of De Hooghe and Metzu in the Old Masters Exhibition at the Royal Academy (now just closed), and at the National Gallery, representing the interiors of more ordinary apartments than those just described, will show how much effect can be obtained by the simplest colours. The floors of these rooms, I should say, are generally in oak on the upper floors; on the ground-floors they are invariably paved in brick or marble. The chief decorative feature in the ordinary Dutch house is the chimney-piece, generally made in wood, painted a dark colour, rising to the ceiling, with a shelf, on which, even in the most ordinary dwellings, will be found a range of blue and white plates. The chimney opening is, of course, entirely lined with Dutch tiles.

I must now, after this digression, return to my subject of the town-halls. The later portion of the town-hall at Haarlem, which now forms the entrance to the museum, is a very good specimen of early seventeenth-century Dutch Renaissance. In the town-hall at Hoorn the architect has attempted an arrangement that never looks dignified; the building is placed on the angle of two streets (a very obtuse angle of about 160 degrees); the entrance doorway is placed on the angle, and, projecting slightly from the front, masks it. On the first floor the mullion of the window above forms the angle; above is a small gable with pilaster in centre, carried up to form a *quasi*-finial with the Dutch Lion sitting at the top. The façades on either side of this central angle are treated similarly, with large-stepped gables of two-stories of windows. The town-hall of Kampen has a picturesque tower. Its chief peculiarity is its parapet; it is carried by small segmental arches supported by corbels, and is pierced with tracery. Instead, however, of containing the gutter, the water flows off from the roof beneath it, so I am afraid it was put on for ornament only; it enables workmen, however, to get to the gutter or roof for repairs, or for throwing the snow off, and therefore it serves some practical purpose. On the whole, perhaps, the town-hall at the Hague is one of the best Renaissance buildings in Holland, and is the only building worth noting in that town. The principal front, with its central gable, is fine and well proportioned, and the arrangement of the octagonal tower with a smaller gable at the side is very picturesque; the whole is built in red brick with bands of stone; the principal gable, the main entrance, and flight of steps in front being entirely in stone, so, as it were, to give greater importance to it.

We now come to the waaghuisen, or weighing-houses—public buildings almost peculiar to Holland. As the name denotes, they are chiefly used for the weighing of cheeses. On the upper floor are the offices, and on the ground-floor are the large weighing-machines and storerooms. The cheeses are brought up from various parts of the country in gaily-painted waggons, which on market-days form a most picturesque assemblage with the piles of yellow and red cheeses. The waaghuis at Deventer is one of the best Late Gothic buildings in Holland; it stands detached on three sides in the middle of an open square, and is built in brick and stone. At one angle is the staircase in an octagonal turret decorated with blank tracery; it is balanced by a small oriel turret on the opposite side. The windows between and on the side are of Late Gothic, square-headed, with mullion and transom inclosed within a three-centred cusped arch. An external stone staircase to the main front was added in 1643, and is an extremely pretty specimen of Renaissance work. The waaghuis at Alkmaar, erected 1682, and often mistaken for the town-hall, is one of the best types of Dutch architecture. The front of the building facing the canal is built of stone and brick of two colours. It is of two stories and surmounted by a gable, with two orders of pilasters and cornices, a gablette, large console brackets, and figures—obelisks and vases forming finials.

Besides these, the waaghuis at Amsterdam, erected in 1488-1525, and the most picturesque building in that town, possesses a series of towers and corner turrets, which with their pointed high roofs form a most picturesque assemblage.

Of other public buildings, the Kanselerie of Leuwarden (now the Court of Detention), the Arsenal at Hoorn, and the Fleesch-halle at Haarlem are all interesting and of special character. The first-mentioned of these—a building of from 200 to 250ft. frontage, with two stories—has a range of square-headed windows on each floor enclosed within three centred arches. One-third down the main front from the right hand and over the entrance doorway is a lofty gable, of such unusual design and complication in its character that I thought it worth while to prepare a large diagram of it taken from my sketch-book, to enable me to describe more accurately its constituent features. The entrance doorway, and features immediately above it, and the external staircase and stone balustrade are of a later date.

The arsenal at Hoorn is interesting for the effect obtained by the decorative disposition of the bricks in the front, and it is, fortunately, almost singular in the attempt to make the front adapt itself to the street, which does not run at right angles with the block. The block forms angles of 115 degs. and 75 degs. respectively, and all the returns of the doors and windows are made to these angles. There is a similar instance of this at Bourges. The architect here has failed to take advantage of the site, and a corner turret containing the staircase, which now is placed awkwardly in the angle of the block inside, would have formed a picturesque feature, and got rid of the irregularity of the site without any material increase of cost or loss of space. The fleesch-halle, or meat market, at Haarlem, though very debased in style, is extremely effective. It is built in red brick and stone; the faces of the quoins and bands of stone, instead of being flush with the brickwork, are brought out about an inch and a half. This is enough of itself to make the building look what may be called "busy"; the agony is then piled on in the shape of vases, finials, corbels, consoles, console brackets, obelisks, bull's-eyes, cartouches, and other decorative features to such an extent that any attempt to draw the building in perspective drives you wild. It would not be so difficult, however, to draw it in elevation, and, therefore, the original design did not present the same difficulty.

I have now of public buildings only the city gateways left to mention, and these must at one time have formed an unrivalled series of characteristic specimens. Unfortunately, nine-tenths of them have disappeared, and it is only in the so-called "dead cities" that any are to be seen. There are two in Hoorn (a third having been destroyed two years ago), one in Zwolle, one in Haarlem, four in Kampen, one at Enkhuisen, three in Zierikzee, and a few others probably which I have not seen. The most interesting are two of those at Kampen (of which I have drawings of one here), a fine example at Zwolle, and the two at Hoorn. The most ancient is the one at Hoorn. Though called "poort," or gateway, it has no entrance archway, and probably derived its name from its having been erected to defend the entrance to the harbour. It is circular on one side, towards the sea or harbour, and presents a straight front towards the town, with an octagonal turret at one angle. It is built in stone and red brick, and surmounted by a high roof and belfry, the latter, however, of later date. The lower portion of the other gateway reminds one of some debased Roman archway, so strictly does it keep to the architecture of the second or third century of our era, even to the long Latin inscription on the frieze. In this and other buildings similar inscriptions suggest that the Dutch architects of that period must have considered their nation to be the great civiliser of the modern as the Roman was of the ancient world, and their prowess upon the seas at that time, and the steady, resolute way in which they made themselves their own masters, gives them, or rather gave them, some title to the claim.

I come now to the domestic buildings, which may be divided into three classes: 1st, houses with shops on ground-floor, or warehouses; 2nd, private houses, villas, and summer-houses; and 3rd, farm buildings. The first class are the oldest and most interesting, and seem to have preserved their original arrangement better than in any other country I am acquainted with, except in Brittany and in some of the towns, as Lubeck and Dantzic, on the Baltic. The chief noticeable feature about them (the Dutch shops) is the loftiness of the shops, whilst in Brittany, as at Morlaix, for instance, the shops are barely 7 or 8ft. high, in Holland they vary from 12 to 16ft. The shop-front is nearly all glazed in small panes, with thick sash-bars. It is divided into three bays by solid posts, the compartment in which the door comes being the narrowest; above the door a moulded transom runs across the front. The windows of the lower portion are closed with hinged shutters falling forward, which form an external counter during the day. Sometimes the upper half of the shutter is hinged at the top and supported on iron brackets, and forms a shelter from the rays of the sun. At Alkmaar there are several instances in which a hood is carried along the whole of the shop-front, and the light enters the shop through the windows above it. The height of the houses is various; sometimes, as at Enkhuisen, there is only an attic story above, with windows in a gable or dormer window; sometimes the house rises to two or more floors above. The termination of the older buildings is invariably a stepped gable. The gutter lies on the party-wall between, which is not carried up as a preventative against fire. According to the width of the front, there are two or three windows in each story. These windows are divided by a central wooden mullion and one or two transoms. The upper portions are glazed with lead lights, the lower have small casements opening inwards, with thick sash-bars dividing them into panes, and an

external hinged shutter which opens outwards. The window-frames are invariably set back about 4½in., and have three-centred moulded arches over them, with decorative tiles and bricks in the tympana. The fronts of all these older houses are in brick, with stone bands at intervals, and stone strings. There is very little if any carving, and this is restricted to shields setting forth the trade of the occupier. In the upper part of the gable, in almost every house, is a pulley protected by a wooden hood. When the whole of the building is devoted to stores, in the centre of each story is a door for the admission of goods. The design thus described holds good for all the buildings erected in the middle half of the 17th-century; thence, in the 18th-century, the stepped gables give way to rococo designs, with small pediments at the top; console brackets of various forms, with garlands and panels and other decorative features of the time. The effect of this is extremely picturesque, though the forms are occasionally of such a nature as to cause a shudder even to a designer in the Free Classic style. (Note example at Leuwarden in the accompanying plate.)

In Amsterdam the horrors of the French Louis XIV. and Louis XV. style run wild in every gable, which, to my mind, makes that town one of the least interesting in Holland. Whilst mentioning Amsterdam I should notice a variety one finds there. In that portion of the town occupied by the Jews the ground-floor is elevated some 5ft. above the level of the street, and the entrance door is reached by a small flight of steps, thus admitting of a basement and basement shop, to which you descend by a few steps. These houses, however, may have been built for residences, as the ground-floor has only ordinary domestic windows. The pulley and hood, however, is found at the top of every house in Amsterdam, which inclines me to believe that it was considered to be of use in private houses.

Much of what has been described as belonging to the first class applies equally to the buildings of the second class, viz., private houses, except, that, as a rule, all the older houses have been converted into shops. The chief feature noticeable in the houses is the sash-window, which was introduced in the eighteenth century. The lower part, which rises two-thirds of the total height, alone is hung, so that only the lower part of the window can be opened at all, and that only one-third of the height. As the rooms are comparatively lofty, it is not of so much importance as it would be in the low rooms of the same kind in England. It has one advantage, that of allowing the lower part of the upper sash to become a transom, which is occasionally, as in Rotterdam, richly carved. A great number of all the houses in the two classes have the canal in their rear; and this suggests a very picturesque feature, a kind of inclosed balcony, which forms the scullery of the house. These are generally constructed in wood, and painted in bright colours. The rear elevation of the houses in this case are generally covered with cement and painted, and the gables are finished with plain barge-boards. The level of the canal is invariably so much lower than the street that these sculleries are on the basement floor, and, instead of projecting, they are sometimes set back, the walls being carried on a large circular or elliptical arch, which constitutes a very picturesque feature, especially when, instead of being inclosed as a scullery, it is left open as a small court, filled with flowers, with an open balustrade and gate and two or three steps down to the canal.

One of the noticeable features in the private houses is the ground-floor room, the drawing-room facing the street; the sills of the windows are low, so that any passer-by can look into the room, the wire-blind of fantastic shape only covering a portion of the window. This drawing-room must be the proverbial room of which we hear so much as to its cleanliness and order. It is entered only once a week, on Saturday, when everything is thoroughly dusted and cleansed, and it is then left for another week, when the same process is gone through again. I very rarely, if ever, saw anybody sitting in the room, though possibly I may not have passed at the right moment, or the persons in it may have been ensconced against the front wall, the small spiegels or looking-glasses attached to each window allowing the person inside to see anybody passing in the street. These looking-glasses are also found in the first-floor windows, so that the young ladies are able to see a passer-by without being in turn seen. The periodical cleansing of the fronts of the houses is amusing and sometimes troublesome; they have a sort of pump-squirt, which they place in a tub of water, and wash down the whole front of the house; woe betide the unfortunate man who may leave his window open, or who happens by accident to go to the window when these ablutions are being carried on! The amount of washing that goes on apparently every day in the week is quite astounding. I have spoken hitherto of the town residences; most of the Dutch upper and middle classes have, however, small villa residences outside the town. These are extremely simple in plan, and, though poor in design, make up for it by the most abundant display of colour. These villas are all painted, and a variety is obtained by making the cornices, the window-frames and sashes, and shutters all of different colours, or of different tones of the same colour. The favourite colour is green of two shades; the monotony of this will be varied by the window architrave or the frame and sash-bars being painted red, the cornices being purple or brown. The gardens with which they are surrounded are laid out in beds with flowers of various kinds of the most brilliant hues; and instead of the front wall being just high enough, as in England, to prevent your looking over, in Holland they protect themselves by an open railing or balustrade only, and a small gateway—all in wood; the rails white with red tips, and a green rail. Unfortunately, these are always kept in good order, and regularly painted, so that the crudeness of the colours can never be toned down by the action of weather and age.

These villas all delight in names given by their owners, which are painted up in large characters —"Lust en rust" (pleasure and ease), "Vriendschap en zezelschap" (friendship and sociability). The most frequent one I saw sounds very funny in English; it was "Ruim sigt," which means, I believe, "a fine view." In no feature do the Dutch people seem to take more delight than in the outbuildings known to us as summerhouses. These are generally placed at the bottom of the garden overlooking the canal, or a meadow separated from the house by a narrow stream or ditch, over which a foot-bridge—to be raised at pleasure—is thrown. These summer-houses are generally octagonal on plan, or, at least, the side facing the canal has the angles canted, so that the windows in it may command up and down the stream. Sometimes, in addition, there is a small balcony of wood in front of them. These summer-houses are always built of wood, with a tile roof, and their designs are not only of the most fantastic character, but they are painted all sorts of colours. The match-boarding, running in horizontal courses, is frequently painted white and green, or white and red, in alternate bands, the window-frame and shutters being painted as before described. The sides of the great canal by Zaandam, for two or three miles, are lined by a succession of these summer-houses. To the greater number of these a more architectural character has been given by raising above the bow or canted window gable ends of various designs, generally in imitation of stone construction though built in wood.

I heard a good deal of the peasants' villas and farm buildings, so I took a carriage from Hoorn to Enkhuisen, and stopped on the way to make sketches. The principal form of farm building that I saw I have drawn out for your information; it represents a fair type of those which you see scattered throughout the country. There is only one story, the whole covered by a four-sided thatched roof. Sometimes, when a building adjoins a road, a more architectural appearance is given by carrying out the gable over the principal room, and this and a portion of the other part of the roof is covered with pantiles, the thatch being sometimes cut in patterns. In these farm buildings there are only two sitting-rooms and a kitchen, one of the sitting-rooms being furnished with bunkers, and used as a bedroom. At the back is the stable or cow-shed, the waggon-shed and entrance to same on the right-hand side; the fireplaces are generally arranged in the centre of the house, with a single stack of chimneys in the centre, or slightly on one side. The walls are all painted in bright colours, and the lower 2ft. of the house is distempered a pale blue, as also the clinker pavement round, and the lower part of the stems of the trees! The pathway leading to the entrance doorway and to the stables is formed of red and yellow clinkers arranged in patterns. Sometimes on the side of the house is planted a row of trees, which are cut to shape, and the branches spread out to shield the windows from the sun. This system of cutting the trees to shape, sometimes of the most fantastic kind, obtains occasionally in English villages, the forms being more fantastic here than I have ever seen in Holland. The peasants' residences are one-story buildings, not very picturesque, but extremely well kept in order.

There only remains for me now to say a few words about the windmills, which not only form so constituent a feature in Dutch landscape, but are a very important part of the farming property. They are of two kinds—those which are employed for the irrigation of the land and for pumping water out of the polders, which are sometimes 30ft. or more below the level of the sea, and those which are used for grinding corn, sawing wood, and every possible use for which we employ steam-power. Sometimes these windmills tower up to 60 and 70 or 100ft. high, and sometimes they look like mere toys. The construction of these windmills is more or less the same throughout: the upper portion is generally of wood, covered with slate or with boarding; the lower portion, which contains the residence of the millowner or tenant, is in brick; the beams and crank holding the sails are sometimes richly carved, and as usual all the woodwork is painted a brilliant colour.

This exhausts as much of the subject as I have any right to talk about after a month's visit. Although I have extended my route somewhat beyond the ordinary tour of English travellers I have seen sufficient to warrant my belief that there is still a great deal more interesting work to be found, the great difficulty I experienced being the want of a proper guide-book; in fact, it is only within the last two or three years that any one has thought it worth while to go beyond Amsterdam, Rotterdam, and the Hague. The works of Henri Havard and of Charles Wood chiefly induced me to vary my trip, and to run over what, in some respects, was an unexplored ground for an architect. Looking broadly at the recollection of my trip, I seem to have been permitted to go back 200 years to make my acquaintance with the Dutch people as they were then. Before going I went to see performed the Dutch play "Anna Mie," and though I was told that the scene of that play dates back some 200 years, and that I might be disappointed if I expected to see the same customs and costumes, I do not think that was the case, for at Hoorn, Enkhuisen, and Kampen there were the same old houses, the people wore similar costumes to those of their ancestors, and if the dialect had changed, at all events it was all the same to me. I hope some of you may be induced to extend your tour some day to Holland, and if so that your impressions and recollections will be as pleasant as mine are.

CHIPS.

St. Brycedale Free Church, Kirkcaldy, was opened last week. The church is built in the English Gothic style of the 12th and 13th centuries, and is said to be the finest ecclesiastical edifice in Fife. The spire, founded on rock, rises to the height of 200ft. above the ground, and is seen from all parts of the burgh. The building is oblong, and is seated for 1150 persons.

The Lord Bishop of Durham has presented the town of Bishop Auckland with a Young Men's Church Institute. Plans and specifications have been prepared by Mr. Robert W. Thompson, architect, Bishop Auckland, and the work will be commenced at once. The total cost will be about £1,600.

Mr. Chas. A. Alexander, 4, Rue Régnard, Place de l'Odéon, Paris, is the author of "Set Square," submitted for the Soane medallion and awarded a certificate of merit.

At the quarterly meeting of the Bath and Wells Diocesan Societies, held at Wells on Tuesday week, grants of £100 were made towards a mission church in St. John's parish, Bridgwater, and of £10 towards a new aisle to Monkton Combe Church, near Bath.

A cottage-hospital and convalescent home is about to be opened at Llandrindod Wells; it has been built from the designs of Mr. Ernest Day, of Worcester.

A new organ, built by Messrs. Conacher and Son, of Huddersfield, was opened in Union-street Congregational Chapel, Brighton, on Wednesday.

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ILLUSTRATIONS.

ST. MARY ABBOTT'S NEW CHURCH, KENSINGTON.—CHADWICK MUSEUM, BOLTON.—SECOND PREMIATED DESIGN FOR NEWBURY GRAMMAR-SCHOOL.—DUTCH GABLES AND BRICKWORK IN HOLLAND.—HOUSE AT BALHAM-HILL.

OUR LITHOGRAPHIC ILLUSTRATIONS.

ST. MARY ABBOTT'S NEW CHURCH, KENSINGTON.

Within the last few weeks we have published several details of this important and recently completed church, including those of the entire spire and tower. To-day we finish our series by publishing the east and west fronts, with an elevation of the beautifully-designed spire, and also cross and longitudinal sections of the building. A general plan has already been published. The church will accommodate 1,500 people, and Sir Gilbert Scott, R.A., was the architect.

THE CHADWICK MUSEUM, BOLTON.

This museum is the gift of the late Dr. Chadwick, and was erected for the Corporation from the design of Mr. R. Knill Freeman, Bolton, selected in open competition. The main entrance is placed in the centre of the principal front; it is in the form of a recessed porch. The hall, 14ft. by 12ft., opens by means of large folding doors into a corridor 10ft. wide, having at either end the entrance to the lower museum. The staircases, of good width, leading from the lower to the upper museum, open out on each side of the corridor, and meet in a central flight over the entrance-hall. Directly facing the entrance, and separated from the corridor by a glazed screen, is the curator's room, the position and arrangements of which have been specially considered with a view to supervision. Glazed screens at either side give the curator control of the approaches to the museum and staircases, while small angle windows enable him to see what is taking place in the various rooms. The museum is divided on each floor into four rooms 30ft. by 20ft., connected on the side next the park by a wide corridor, having on the ground-floor an entrance from the park, with a large oriel window over. All the rooms are arranged *en suite*. Visitors are thus enabled to go through the museum, entering at one side and leaving at the other without confusion. The plan of the upper floor is similar to the lower, except that a sculpture gallery is provided on the corridor and staircase landings. In the basement, which opens from the park at the lower level, are rooms intended for geological museum and for other heavy specimens, also apartments for the porters, heating-cellars, &c. The materials employed are brick, with red Runcorn stone dressings, moulded bricks and terra-cotta ornament being used in string-courses, panels, &c. The roofs are slated with North-Country green slates. The upper parts of the windows are glazed with lead-work of an ornamental character. The internal fittings are of pine, painted, the floors of entrance and corridors being of marble mosaic. The contract was let to Mr. Joseph Robertshaw, of Bolton, for £4,485, and the works have been carried out by him in a satisfactory manner.

SECOND PREMIATED DESIGN FOR NEWBURY GRAMMAR-SCHOOL.

This design was fully described in our notice of the competition on p. 118 ante.

DUTCH GABLES AND BRICKWORK.

This interesting page of quaint bits from Holland are given by way of illustrating Mr. R. Phené Spiers' valuable paper read before the Architectural Association, and published by us to-day on page 324. The remarkably well-designed gables from Enkhuisen, dating from 1625, are as good as the specimen from Deventer, of about the same date, but they show a style of work which can soon be lost in the extreme, since quaintness is a quality often not far removed from ugliness, as may be seen by the example here given from Leuwarden. The two window-heads from Dort show two very general types of arched openings, and how they are often treated in the spandrels by the old Dutch builders.

HOUSE AT BALHAM-HILL.

The drawing which we publish to-day, of a residence recently erected at Balham-hill, was exhibited last year at the Royal Academy. The work in execution has been modified somewhat, but the same outlines to the gables have been kept, and the plan is exactly the same. Mr. Arthur Cawston, of 11, Clement's-lane, E.C., is the architect.

CHIPS.

Extensive alterations, including the building of a new chancel, a tower, and reseating, are about to be carried out in St. Mary's Church, Applethwaite, near Windermere, from the designs of Messrs. Patey and Austin, of Lancaster. The outlay will be about £2,000.

A landslip, of about 40 yards in extent, occurred on Sunday evening in the Abbotscliff Tunnel of the South-Eastern Railway, completely blocking the line, and stopping rail traffic for several days. In January, 1877, a similar slip occurred at the same end of this tunnel, that nearest to Folkestone, and the directors of the railway then proposed to drive a new tunnel between Folkestone and Dover, more inland than the present series of cuttings and tunnels.

The magistrates of Great Yarmouth remanded on Saturday a young man named Frederick Soanes on one of several charges of obtaining money by false pretences. The prisoner was articled to a firm of architects and surveyors at Leeds, and afterwards went to Sandown, Isle of Wight, where he was employed in the borough surveyor's office, and had an account with the Newport branch of the National Provincial Bank of England. After the account was closed, he filled up and made use of blank cheques in various towns. He admitted the offence in court, and said he should be ruined.

Mr. Vigor, who was appointed arbitrator at the recent Somerset assizes, in an action brought by Messrs. Hutchins and Berry, contractors, against the Honiton town council for extra work done beyond their contracts for draining the town, has awarded plaintiffs £90 9s. 10d.

A monument to the memory of the officers and men who lost their lives in H.M.S. *Eurydice* is being erected in Haslar Cemetery, by Messrs. Bramble Brothers, of Gosport. The base consists of granite blocks prepared at Chatham, and will cover an area of 22ft. by 17ft. The upper part will be of Portland stone, and will be irregularly constructed as a crag, on which will be placed the *Eurydice's* anchor and tackle. On the sloping side of the monument will be engraved the names of all who were drowned. The monument will be 10ft. in height, and will be completed in about two months.

New Roman Catholic schools and master's house are about to be built on the Bitteswell-road, Lutterworth, at the joint cost of Lords Denbigh and Braye. The contract for erection has been taken by Messrs. Law and King, builders, of Lutterworth.

At the City Court of Common Council, last week, it was agreed to let sites in John-street and Thomas-street, Old Kent-road, at 3d. per foot super, for the erection thereon of artisans' dwellings. Several members objected that the Corporation was not justified in letting trust property at less than half its full value, but the City Architect stated that the rent would be higher than he had estimated, and that the stipulation that the land was to be used solely for artisans' dwellings, had not, in his opinion, been a detriment.

A PANEL IN TERRA-COTTA.

We have seen at Messrs. Doulton's, at Lambeth, a terra-cotta panel, designed and modelled in soft clay by Mr. George Tinworth, an artist well known for his ability, who has produced many masterly works, and whose exhibit at the Royal Academy last year may be yet in the remembrance of some of our readers. The present panel is an alto-relievo intended for exhibition at the Royal Academy, and represents "Christ's Triumphal Entry into Jerusalem," and is a finer work than the last. The artist has endeavoured to represent the scene described in Matthew xxi., and by the other Evangelists. The centre figure is that of Christ seated upon the colt of the ass, the latter being in front, led, and the colt unbridled. In front and in the rear of the Saviour the panel is crowded with figures representing the Disciples and the multitude, "who spread their garments in the way." Palm branches are held aloft by the Disciples, who are singing, and the artist has shown a child who is held in order to place a garland on the Saviour's head. Of course, the procession is largely made up of Jews, who are looking on. Christ, in reply to one, points to the stones, which "should cry out if these held their peace," while in front Lazarus is seen leading the Virgin Mary. In the extreme front of the procession a throng of figures is introduced, among them, though behind the nearest figures, the figure of Zacchæus, of short stature, is seen. We notice a variety of incidents: a boy with flowers, the hand of a thief, attempting to pick the pocket of a spectator; various creeping animals are shown in the foreground, and a hen and chickens; while in the rear group of the procession, composed of Disciples, one of the figures is shown holding a roll; but the interest is centred in an old man, evidently intended for Judas, who is stealthily taking a bag, the price of the Saviour's betrayal. The composition is agreeably broken by the introduction of a boy with a palm-branch in the foreground, and a lamb, beneath the foal, which has escaped. An old man is pulling at the branch behind, evidently disapproving of the boy's following. The composition, crowded with figures and accessories, might have been rendered less confusing by a little more grouping. The figures are animated, and the faces expressive of emotion and excitement, and the artist has been successful in giving movement to his figures and drapery. Mr. Tinworth must be allowed to have undertaken a somewhat difficult theme. The treatment of so many figures and costumes was no easy matter where several incidents had to be told; and the technical qualities of the work are of the highest kind. It may be thought the accessories and the foreground are a little too naturalesque; they may be, but the artist has presented us wi h almost a living representation, and the very delicacy, action, and individual expression he has shown, indicate undoubted powers. Mr. G. Tinworth's terra-cotta panels, designed and modelled for the Guards Memorial Chapel, are works displaying also much vigour of conception and spirited handling. The panel we have described measures 10ft. in length by 3ft. 2in. in height, and the colour of the clay is very agreeable and stone-like.

A group of new buildings are being added to Christ College, Brecon, from the designs of Mr. J. B. Fowler, of that town. They include a principal schoolroom, 80ft. by 25ft., beneath which are three large classrooms; oppoite to these rooms, separated by a corridor on each floor, are a science lecture-room and laboratory, with a class-room 40ft. by 18ft., beneath. Another block consists of the head master's house, two sets of private studies heated by hot-water pipes, and lavatories and dressing-rooms. The school adjoins the ruin of the ancient monastic church, a 13th-century structure, the chancel of which was some years since re-roofed and restored for use as a school-chapel, from the plans of Mr. J. P. Seddon, of Queen Anne's-gate, Westminster.

A new Primitive Methodist chapel, with schoolroom beneath, is about to be built at Wall Nook, Greetland, from the designs of Mr. W. H. D. Horsfall, of Halifax. The chapel will be 49ft. by 30ft., and will be built of local stone and seated in pitch-pine for 250 people. The contract for masonry has been taken by Mr. Thos. Noble, Greetland, and that for joinery by Mr. E. Schofield, West Vale, the total cost being £700.

Mr. Arthur Linnell was last week elected surveyor to the highway board of West Eddisbury, Cheshire, at a salary of £160 per annum.

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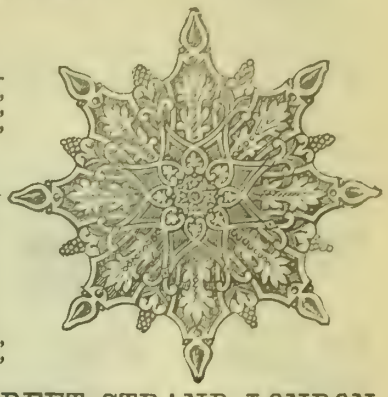

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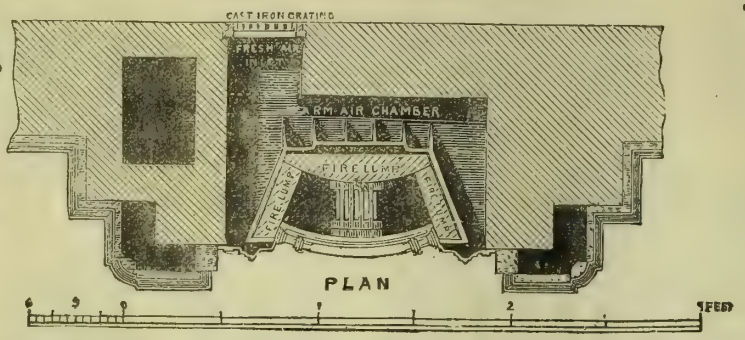

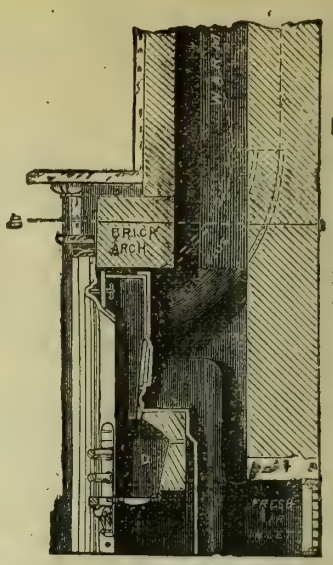

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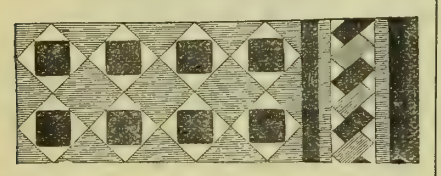

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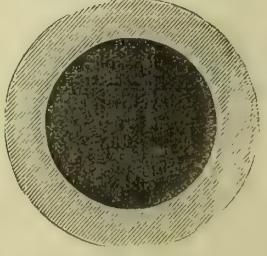

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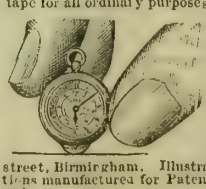

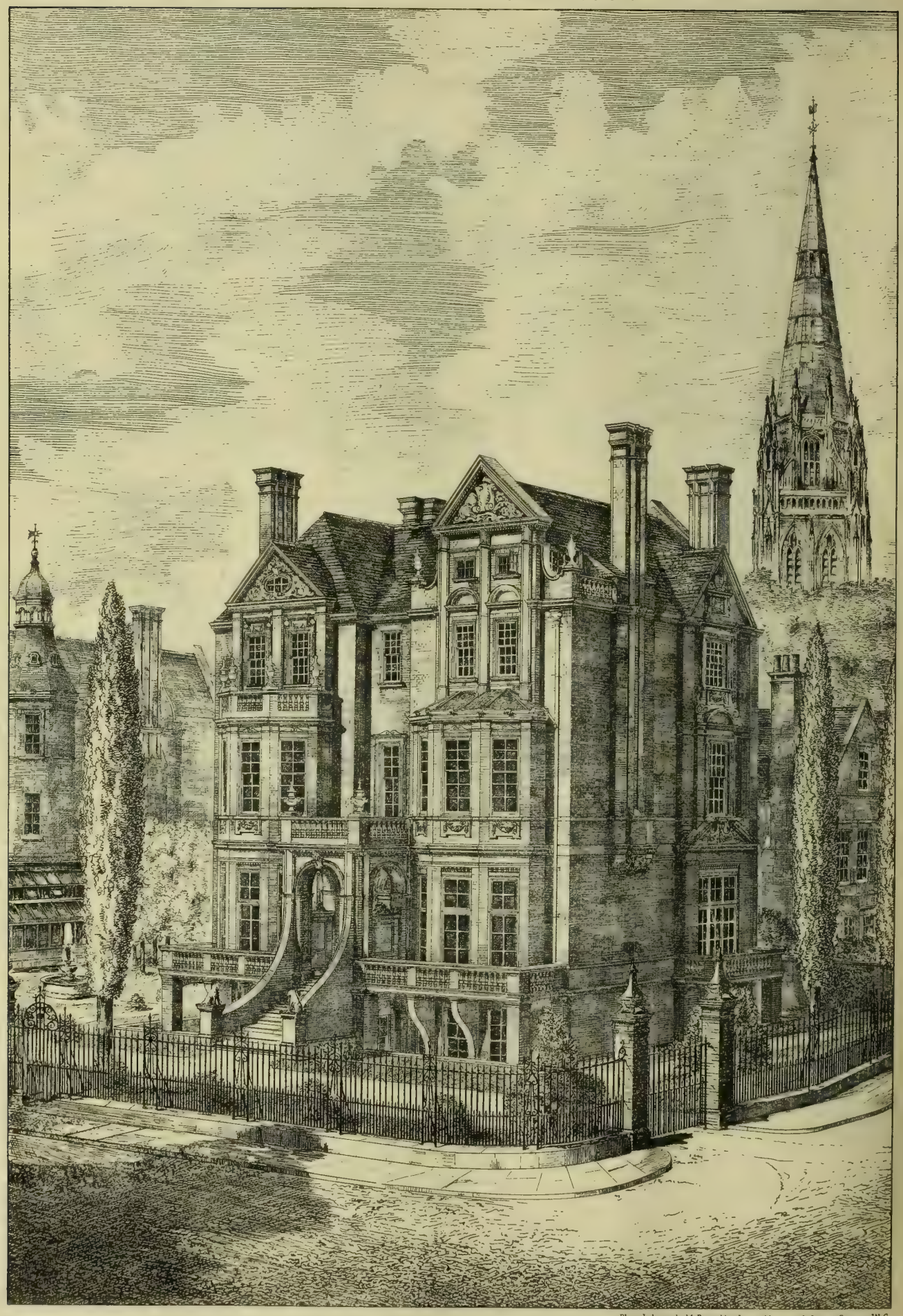

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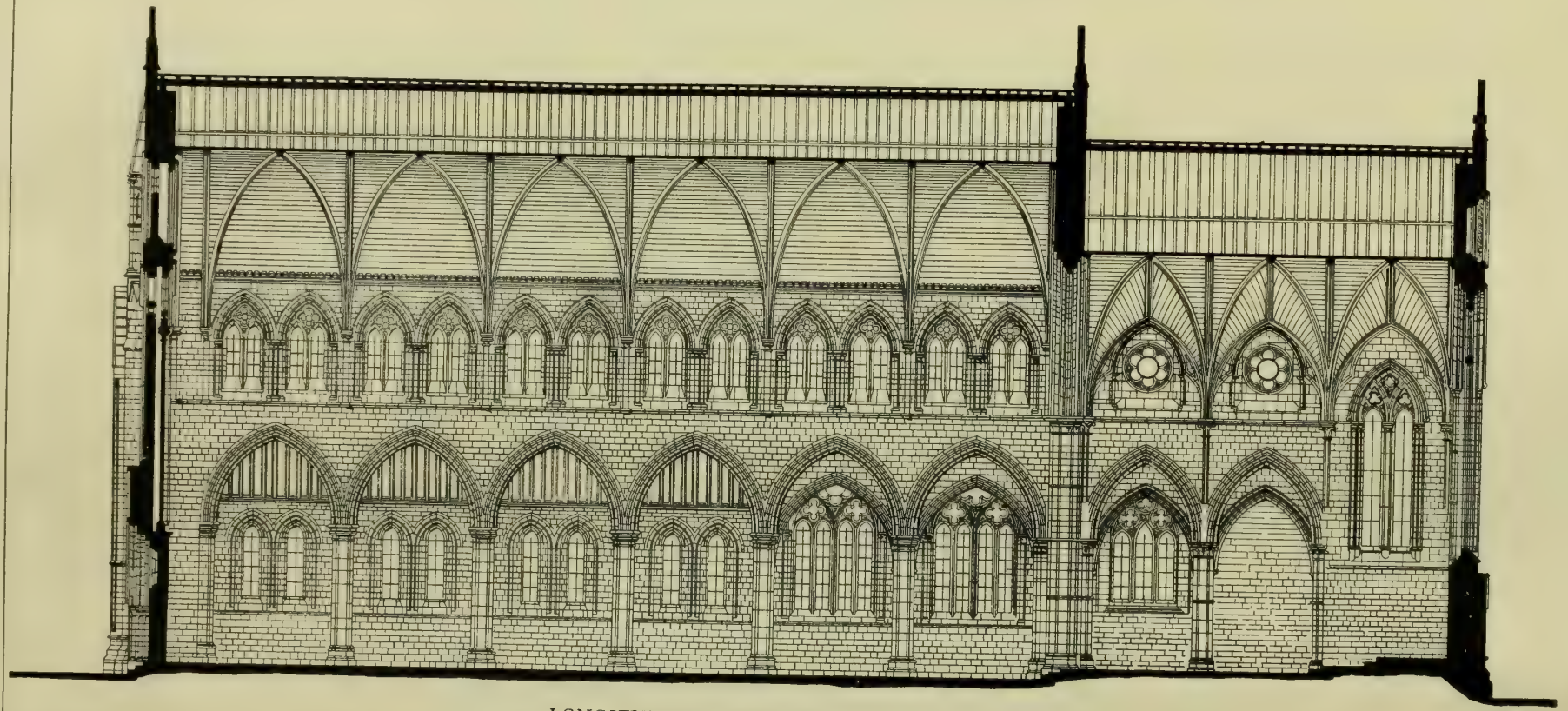

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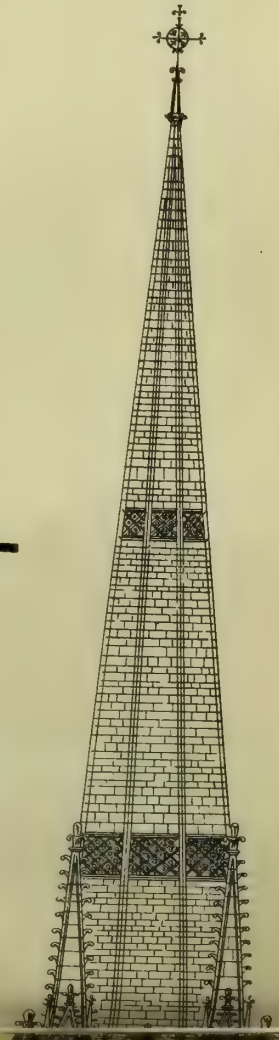

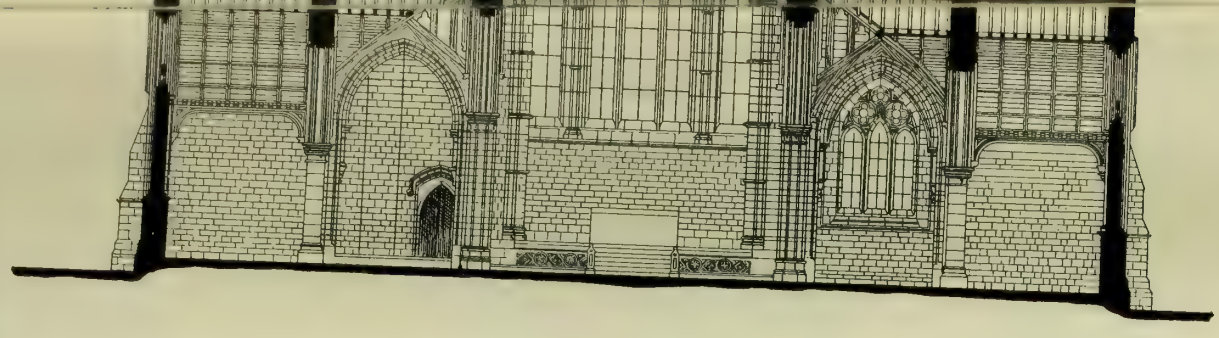

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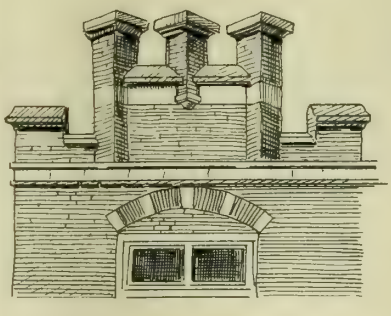

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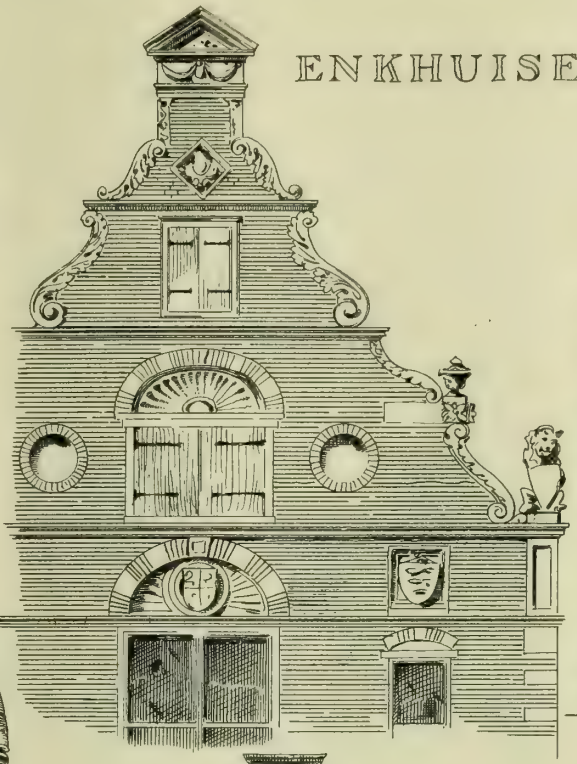

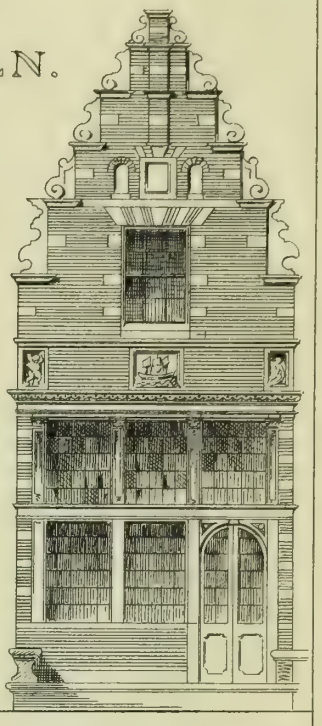

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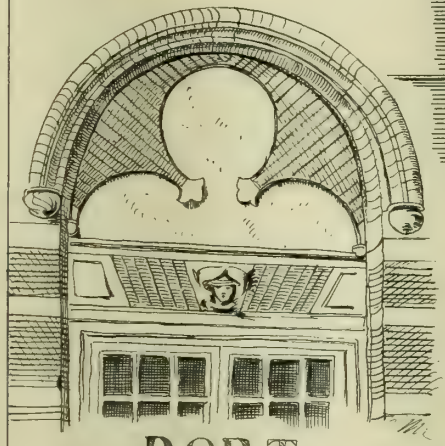

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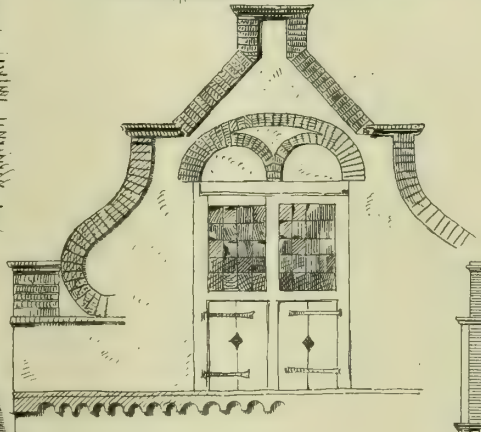

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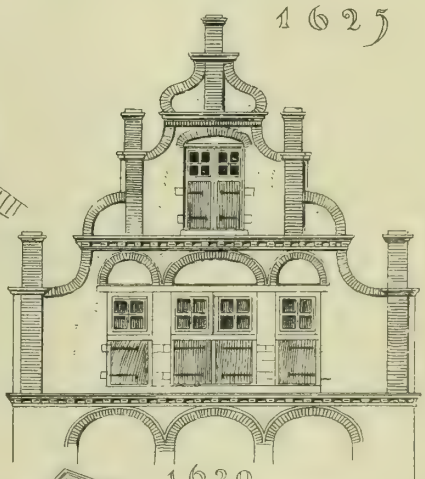

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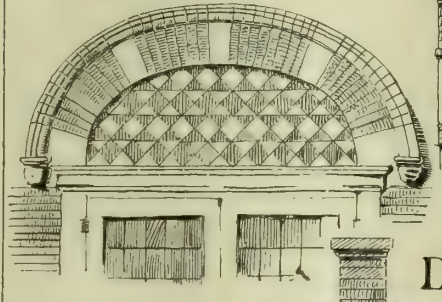

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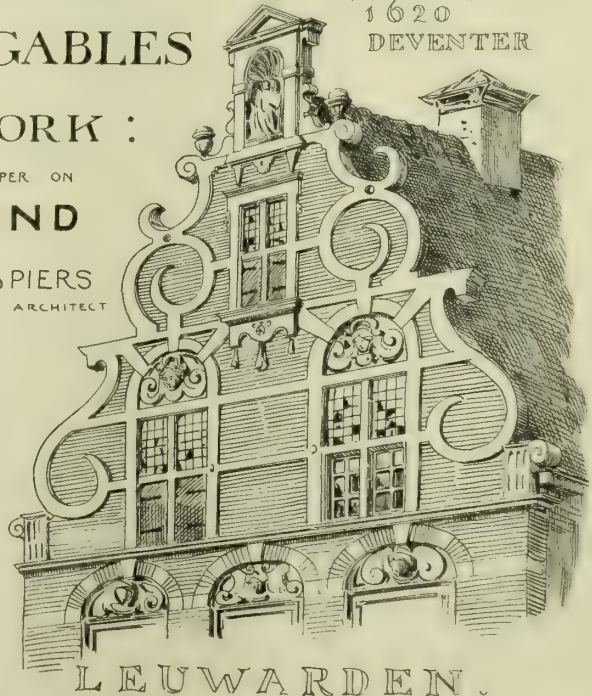

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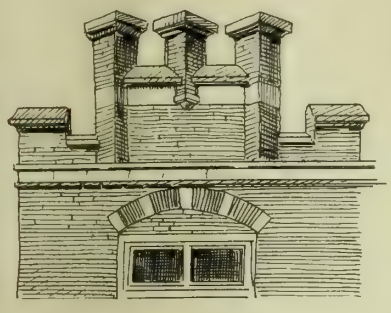

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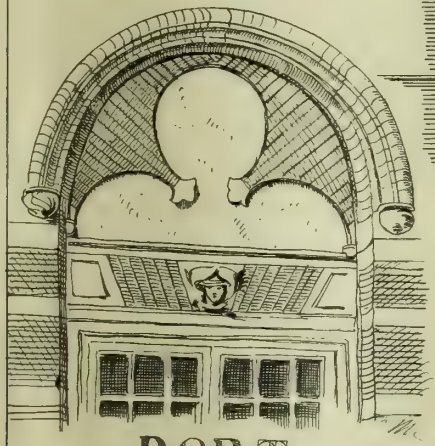

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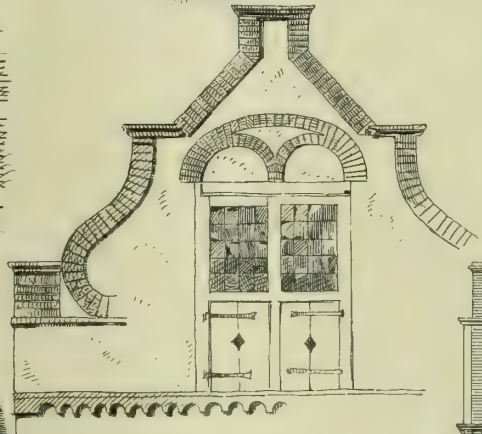

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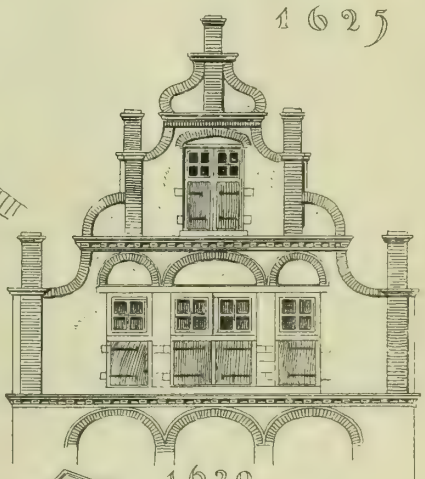

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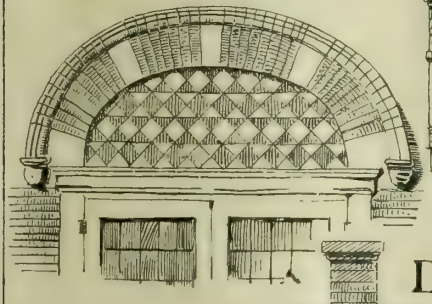

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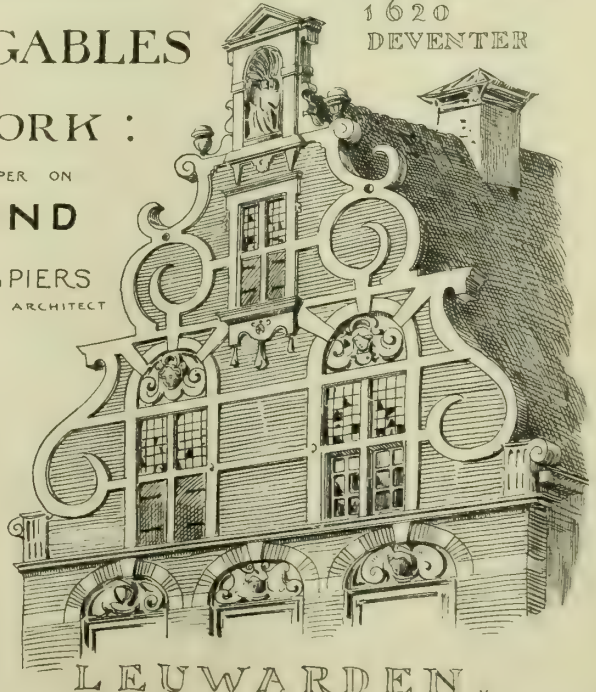

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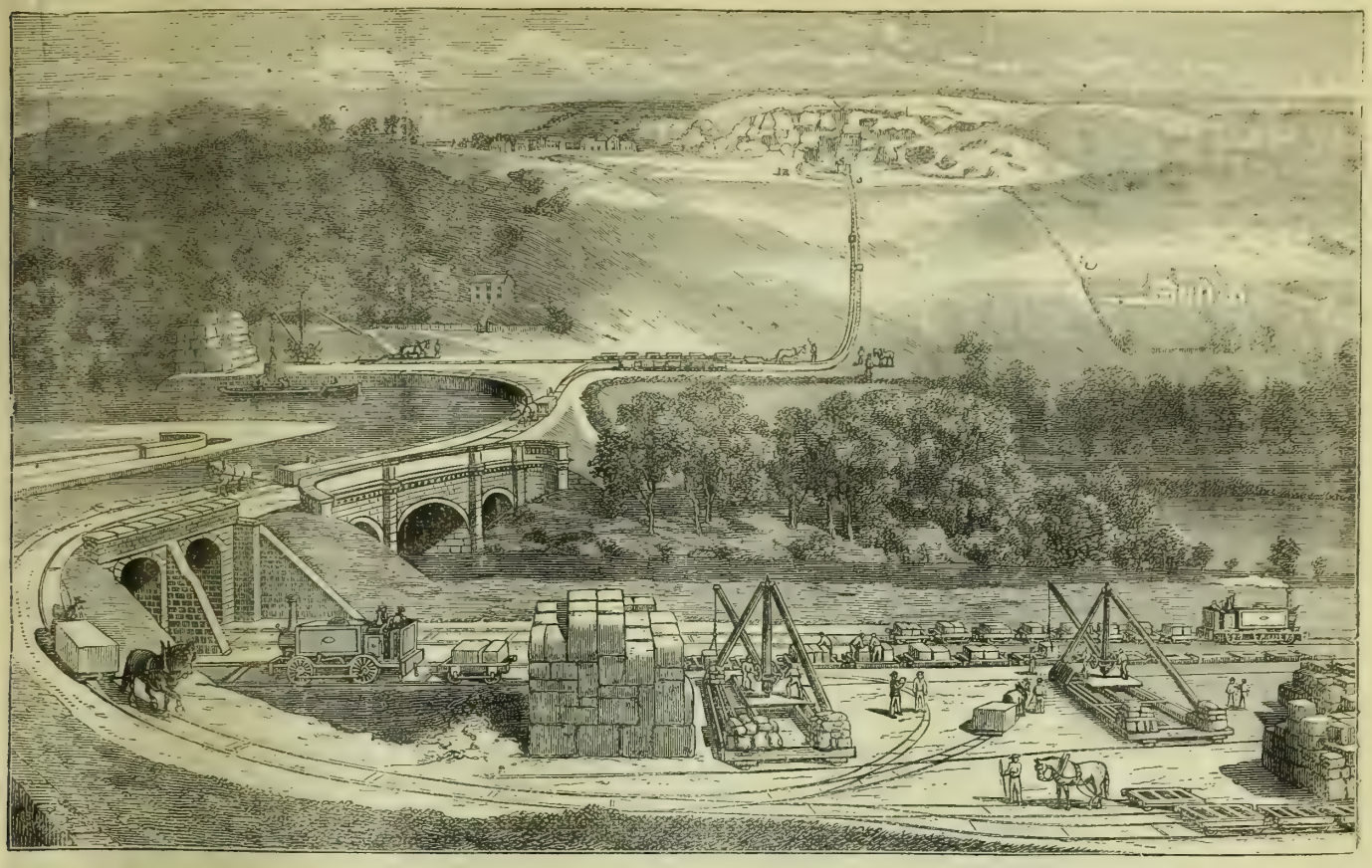

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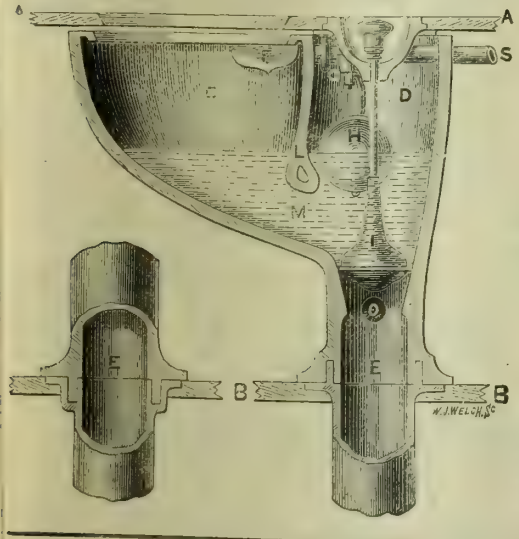

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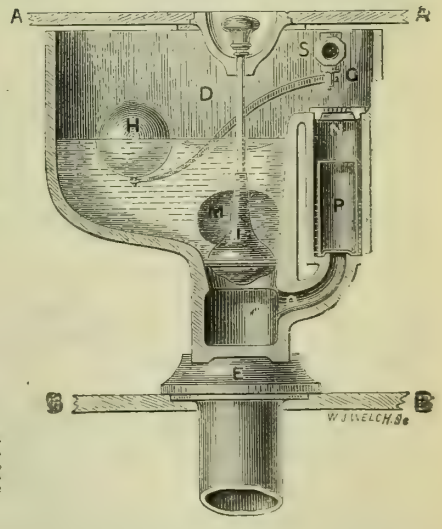

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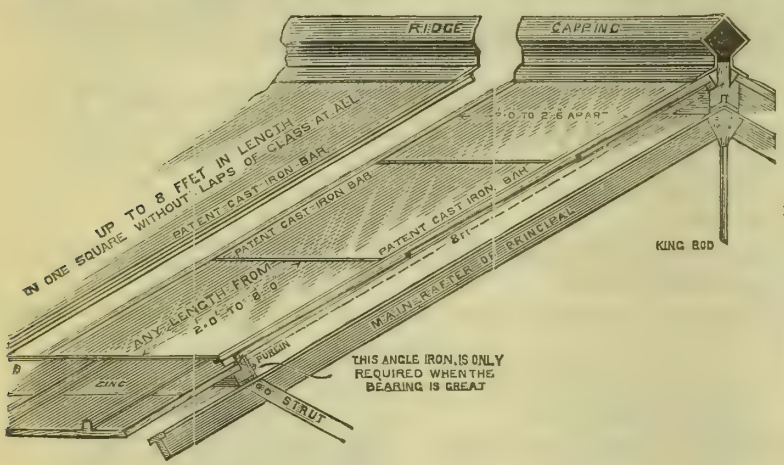

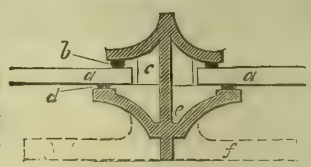

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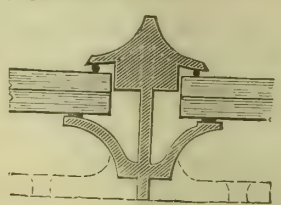

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MR. H. H. STATHAM ON ORNAMENT.—I.

THE first of a course of four lectures on "Ornament, Historically and Critically Considered," was delivered at the Royal Institution, by Mr. H. H. Statham, on Thursday afternoon, the 17th inst. The lecture was of an introductory character, and dealt with the general principles governing ornament, and was illustrated by a great number and variety of examples, drawn to large scale, of parallel types which the author regarded as good and as bad. Having shown that ornament was essentially a metaphysical art, and explained the true function of colour in relation to it, Mr. Statham observed that all true ornament was distinguished by the qualities of rhythm, repetition, symmetry, and alternation. A rhythmical balance of parts was an essential to effective ornament, and was strongly insisted upon by the late Owen Jones in his standard work on the subject. It was a quality that was apparently ignored by the Japanese artists, and it would be interesting could we know how Owen Jones would have reconciled their work with his rules. Ornament was not produced by drawing a series of irregular scratches or even isolated curves on a given surface; but let these scratches, lines, or curves conform to a fixed plan, and the production of ornament could hardly be avoided. The elementary forms might be considerably varied, and the result would be rendered more pleasing so long as the variation was based upon some geometrical form, perhaps rudely worked out. There must be, to some extent, a geometric symmetry, although this need not be very apparent. Very much ornament which appeared to have little law except its own sweet will was capable of reduction to a rule, and owed its value to conformity to this set scheme. However unequal the ornament might be, there must be a clear relation between its distribution and the space it occupied, a law governing the use of ornament being that the ornament must appear not only to fit, but to occupy, the space in which it was placed, so as to show it was intended for that position. Having illustrated this point by completing the foliage drawn on a panel with a few strokes and leaves, which converted it from a weak into an effective design, the author proceeded to another important law—that governing the curvatures of ornament. Curves played a very large part in ornament, and very often they were drawn in a very unscientific manner. This law, a universal one, was that all curves, whether springing from other curves or from straight lines, should be struck at a tangent to the lines from which they diverged. A series of curves were shown upon the screen, exemplifying the fact that when curves conformed to this rule the effect was agreeable and natural, and that when it was departed from the effect was weak and crippled, because the lines would appear to cut through one another whether continued to that point or not. Further, in two designs of leaves springing from common bases, that in which the stems ended parallel to each other would look better than that in which they approached one another; for in the latter the mental effect would be to continue the lines so as to intercept each other. The effect or sum of these qualities of rhythm, repetition, geometrical symmetry, alternation, equal distribution of spaces, and proper relation of curve to curve made up what might be termed abstract ornament. Ornament should not attempt to directly imitate nature; but a very large class of genuine ornament was based upon the adaptation of natural forms. There was also a very beautiful class of ornament not derived from these forms, and which might be distinguished as "abstract" ornament. In the decorative work of all savage nations a great proportion of the ornament was produced by filling up the space treated with simple lines, having little meaning or purpose in themselves. This abstract ornament might be traced in a higher form in Egyptian art, and reached its greatest development of perplexity and mystery in Saracenic art, in which a puzzling and complicated effect was produced by the shifting and rearrangement of a few lines. The familiar Greek key pattern was in like manner a collocation of squares, with one side cut away, interwoven with one another. One of the most intricate Saracenic patterns was a series of concentric hexagons, slightly tilted. Ornament could be produced not only by drawing on a surface, but by varying that surface so as to produce an alternation of light and shade. The effect of these variations of surface or mouldings played an important part in architecture, and was an indication of its character, thoughtfulness, and refinement. As Owen Jones had remarked, if seen in the mass there might not appear much distinction between a Roman and a Greek ruin; but if the profile of a single moulding were examined, the one would be found to be as refined as the other was coarse and thoughtless. Another class of abstract ornament arose from constructive details, as in the coursing of brickwork, or in diaper or herring-bone pattern, arranging masonry in a reminiscence of wooden construction, or as in the familiar stiles and panels of the ordinary six-framed door. Passing now to ornament derived from nature, he would ask how far it was subject to the same laws as abstract ornament. While it must not imitate, it might have various degrees of approach to, nature, governed in their nearness of likeness to a considerable extent by the nature of the material and medium worked in. Thus in crewel work, exact symmetry should be avoided, and the imitation of nature might be comparatively near, but ornament to be placed on a building should be architecturalised. A leading reason against the attempt to precisely copy nature was that in most media it could not be done successfully; the direct effort to reproduce a flower in carving only called attention to the absence of the delicacy, the finish, the fragility of the natural form. Again, such minutely-copied work violated the necessity for fitness for its space and purpose. On the wall was hung a design of a mass of freely-growing foliage, sketched from a capital in a Parisian building; it was beautiful and vigorous in itself, but as carving it was worse than useless. It failed to conform to the outline of the capital, it was too rugged and quite unfitted for its purpose. Beside it was shown a design by the lecturer, wherein the same idea was conventionalised, brought within a heart-shaped series of bounding curves, the only latitude of freedom allowed being that the design grew from one corner of the capital, and that the leaves and their curves varied so as to symmetrically fill up the entire space at disposal. By a still more conventional treatment the same conception could be utilised for parquetry. The principles governing growth in nature must be observed in ornament—*e.g.*, as in actual life, all curves must spring in the same direction, whether flowing from right or left of a central stem, and it was an obvious mistake to repeat the trailing festoons, so appropriate in Renaissance decoration for a wall surface, upon a ceiling. It might be asked, How far the human figure might be used as a part of ornament? In Classic work the human figure had been sometimes introduced with good effect; but the rule must be laid down, that the use of the human figure should be avoided except in grotesque treatment, for if it was well drawn, the figure was worthy of a better position than mere ornament, and if badly done it only gave offence. The most pleasing examples were those in which the human form was rendered stiff and conventional. Child-figures might sometimes be introduced with better result; an effective example of this was in a wall paper pattern by Walter Crane, now hung at the Grosvenor Gallery. The grotesque did not suggest a misuse or degradation of the subject, and might be more boldly employed. The use of grotesque animals upon jugs or other domestic vessels was almost universal throughout the world. The imitation of artificial objects was invariably bad, because it brought back the mind to everyday matters, and it was generally a proof that it was introduced to save trouble and thought. Artificial objects were very frequently used in Roman and Renaissance work, and also in a great deal of the work by Grinling Gibbons, which was often very faulty in conception, although admirably executed. It was an interesting matter for inquiry, how far ornament as such could express special ideas? This could only be done to a very limited extent, and the subjects must be considerably modified to suit its position. In conclusion, Mr. Statham said the value of ornament was to be measured by the amount of thought expended upon it. The next lecture, delivered yesterday (Thursday), was confined to the Egyptian and Classic schools of ornament; in the third, to be given next Thursday, Mr. Statham will take up Celtic and Oriental types, and in his concluding lecture Renaissance ornament, and the Japanese and Adam "crazes" are to be considered.

EXETER HALL.

EXETER HALL, so long associated with the promulgation of Evangelical and Philanthropical objects, has lately undergone considerable alterations and additions. As may be remembered, the proprietors of the building resolved to sell their property, and proposals were made to convert it into a music-hall or hotel. The Young Men's Christian Association requiring central premises for their work, ultimately raised enough money through their friends to purchase the building, and the sum of £25,000 was subscribed, and the premises have been so thoroughly remodelled that it may be regarded almost as a new building in its arrangement.

The committee have made provision to let rooms specially adapted to the purposes of meetings of religious and philanthropic societies, charitable institutions, lectures, conversaziones, concerts, and other public meetings. An inspection of the building reveals many important structural alterations to the lower part, while the means of ingress and egress have been much increased and otherwise improved. We find two new stone entrances, and staircases have been built on the west side facing Exeter-street, flanking the end of great hall and giving access thereto at the gallery end, in addition to which, by the requirements of the Board of Works, the grand staircase from the Strand entrance, which leads to the centre of the long side of hall, has been improved by the substitution of two flights at the upper end instead of the old single one. A new entrance has also been formed on the north side over the original wide area, and a new porch and corridor from the west side, so that in case of crowded meetings or panic two new means of egress are available. In the basement, on the north or long front, the wide area has been covered in by a circular roof of iron ribs with side lights, and is to be used as a gymnasium; the original level of basement floor has been lowered to the lowest course of footing, and the original arched vaults have been turned into class-rooms, each 32ft. by 13ft., and otherwise converted for the purpose of the night schools, &c. The floors to these are paved with wooden blocks, and the openings reduced. An engine and boiler-room, with an intake for fresh air, have been constructed, and by means of a fan air is introduced by channels in the corridors and the basement-rooms, with coils of hot pipes for warming the air admitted to the class-rooms, gymnasium, &c. The vitiated air is extracted through openings, and passes into a wrought-iron trunk, which communicates with the well or hollow newel of the stair-turret at the north-west corner, which thus answers the purpose of an extraction-shaft.

Mr. W. W. Phipson, under whose supervision the ventilating arrangements have been confided, has certainly succeeded in producing an agreeable atmosphere in the basement. Lavatories and conveniences have been fitted up along the Exeter-street area, these being supplied by Mr. Bostel, and the walls of basement have been coloured and relieved by a dark dado and other decorations. A lecture-room, covered by an iron and glass roof, has been obtained in the area on the Strand side, and ladies' rooms are provided.

The ground-floor has been much improved; the office of the secretary, Mr. W. Hind Smith, occupies a position facing the main entrance corridors and thoroughly central, and is provided with speaking-tubes to every part; a coffee and dining-room and reading-room have been arranged, and additional light obtained between these rooms by filling in mullions and glazed lights along the side corridor; while the lower hall has been enlarged by the addition of the old corridor and a gallery over, and now is capable of accommodating 700 persons. A platform has been constructed at the north side, and the gallery now extends on the three opposite sides; the hall has been heated by coils under the platform where the warm air partly enters, and at other points, and now presents an admirable apartment of the kind suitable for lectures: the walls, gallery, and ceiling being decorated in suitable tints of buff, green, and chocolate. The other rooms include a parlour to accommodate

150 persons, reception-room, reference-library, buffet, &c. The mezzanine floor is appropriated to a variety of offices, chiefly committee-rooms for different societies, such as the Ragged School Union Temperance, and other bodies.

The great hall presents little change of appearance, though various improvements have been made in it. The most noticeable of these is the lowering of the galleries at the side of the great organ, which formerly rose to an awkward height and obscured the end windows of hall; the floor of hall has been also lowered under the gallery, and the latter brought forward on cantilevers, adding 5ft. to its depth. The new staircases in Exeter-street afford easy access to this part of the hall both above and below the gallery. The ceiling—a flat, segmental vault—has not been touched, but the pilasters have been relieved from the walls by colour in two shades of buff and brown; the risers of seats are perforated, and hot-water coils have been introduced under them, and on each side of room. The hall is 128ft. by 76ft., and is capable of holding 3,000 people. Formerly, the absence of sufficient inlets for fresh air drew upon the openings in the ceiling, and those in the hall often experienced down draught. We find that eight new inlets have been made in the walls, and these are in connection with the hot coils. The seats have also been made to tilt a little, adding much to their comfort; the cramped and miserably-approached reporters' gallery in front of the organ has been improved, and the stairs and approaches to the platform somewhat altered. A new domed apartment, to seat about 150, approached from the grand staircase landing, is well adapted for council or board meetings.

The decorations are in keeping with the style of the hall, a kind of Greco-Roman, and the predominant colours are buff, French grey, and chocolate in the dados and darker features. The ornament is strictly of an architectural character, and serves to emphasize the detail without being obstrusive or glaring. Exteriorly, the west front facing Exeter-street has been slightly altered by the addition of the flanking stair turrets, a new entrance doorway, and a few new openings—features which have, on the whole, rather improved the elevation. The joinery throughout, in pitch-pine varnished, has been carried out in a very creditable manner, Mr. Priestnall being the foreman.

We may add the plans of the alterations were prepared by Mr. Alfred R. Pite, architect, having been obtained in competition; and the builders are Messrs. Higgs and Hill; the clerk of the works, Mr. J. Brady; and the foreman to contractors, Mr. Seward. Mr. J. Turner Rae is the lessee of the refreshment department. The cost of the alterations will amount to £23,000, £14,000 of which have been subscribed, and the committee appeal to the Christian public to help them to make up the amount, and to make Exeter Hall more than ever a centre of Christian work and influence. We understand the hall will be reopened on the Jubilee day, the 29th instant.

PAPYROTILE DECORATION.

We have this week had brought to our notice a new kind of surface decoration introduced by the "Papyrotile Company," 14, Holborn-viaduct, the manager of which is Mr. A. W. Duret. The "Papyrotile" is a kind of leatherette, and is composed of specially-prepared materials, and possesses an appearance, toughness, and feeling admirably adapted for a wall lining. Many of the specimens have a finished surface resembling leather, but it can be manufactured to represent stamped or carved woodwork, panelling, tiles, or plastic work, and can be embossed on the surface and printed in any colours required. The specimens on view at the offices of the company show a variety of designs and applications well worth the attention of architects and decorative artists. The "Papyrotile" is made to any size, but the specimens shown are from 4in. to 8in. square, and have the appearance of thin tiles. One of the examples shows a black dado, imitating carved ebony, inlaid with blue and white panels of the same material, surmounted with a rich wall-pattern of Grolier design, embossed with a rich Italian Renaissance design upon a brown ground relieved by black and gold. One side of the room is decorated with a quietly-designed 17th-century wall pattern, suitable for a library or study, embossed and printed in four colours, the dark bluish green ground having a folial pattern of sage green with buff flowers shaded with black. The wall-decoration is surmounted by a light frieze, with foliage, and the dado is composed of small panels to resemble ebony with gold margins, and is relieved by a dado frieze of embossed foliage upon a gold ground. The price of this is about 7s. 6d. a square yard. Another specimen is a rich brown relieved with gilding in the centres. We noticed a staircase dado with frieze; the lower part is of embossed papyrotile in blue and brown relieved by black mouldings, the effect of which is very rich. The material is suitable for plain simple colour, or the most elaborate kind of relief ornament; it may be applied to ceilings as well as walls and panels, inlays for furniture, and a variety of other decorative purposes. It can be fixed to the wall-surface with glue, or to battens the width of the tiles. The surface, we understand, can be brushed or washed with water, and the tiles can be bent to curves. The non-conductive nature of the material will render it a useful lining for thick masonry walls, and as a less reflecting surface to sound than plaster or cement. If, as we hear, the experiments which are being made to render it waterproof succeed, the "Papyrotile" must take its place as a valuable decorative material of greater durability than wall-papers, and comparatively cheaper than other substitutes.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Cambridge Antiquarian Society.—At a general meeting of this society held on the 14th inst., Mr. Griffith read some notes on a series of neoliths collected in Cape Colony and the Diamond Fields by Mr. J. Rickards, now of Cambridge. These implements, which were exhibited at the meeting, were arranged in four series. The first included a number of flakes, scrapers, grinders, and heavy, perforated stone balls, all found on the surface of the ground. Some of the finer examples of scrapers bore a remarkable resemblance to English specimens, some of which were also exhibited. The two next series were found in shell-mounds skirting the beach at East London and Port Elizabeth. They were of two periods, the earlier being mixed with bones of large mammals; the later mounds contained large quantities of rudely ornamented pottery, and hammer-stones and rubbers. The fourth series were taken from Bushmen's shelters. Professor Lewis exhibited a real-size drawing of the statue of Athené, found on Dec. 30th, 1880, in a Roman house at Athens, and supposed to be a reduction of the chryselephantine statue in the Parthenon. The figure was 4ft. 5in. high, of Pentelic marble, and was armed with helmet, shield, and ægis, and had a serpent as a girdle, while a Gorgon-head formed the boss of the shield.

The Bristol and Clifton Sketching Club and Junior Architects' Society.—The opening visit of the members of this club (formed February 8th, 1881) took place on Saturday, March 12th, to the Church of All Saints, Corn-street, Bristol, when there was a large attendance, among those present being the President (Mr. Charles F. Hanson, F.R.I.B.A.); Mr. J. C. Moncrieff (Vice-President); Mr. E. H. Edwards, and others of the local architects. The proceedings were commenced by an address by the President, who proposed, this being the opening meeting of the members, to explain an idea which had suggested itself to him, as the most practical for their mode of working during the coming and following seasons, which mode of working he (the President) summed up as follows:—He proposed, at each visit, to dispose of and place each member at such portion of each edifice as he (the President, or in his absence, either of the vice-presidents) thought fit, and as "many hands make light work," the members would, by taking measured drawings, obtain complete details of each edifice visited; the exterior elevations, &c., as far as could not be taken by members being obtained from extant plans or publications. The work thus executed during each season could, the President surmised, be published at the end of each year as "Reminiscences of the Ecclesiastical and Domestic Architecture of Bristol," or some other appropriate title; thus giving the public the benefit of the labours of the club, such work to be one that could be relied on by the profession and the public as a standard work of reference. The President then urged upon his hearers the necessity of working neatly and accurately, so as to attain this end, and concluded with a description of the edifice under consideration, and which is rich in architecture and ornamentation, on which the members commenced to operate in the manner advised by the President.

British Archæological Association.—The eighth meeting of the session was held on Wednesday week, the Rev. S. M. Mayhew in the chair. Mr. R. Blair exhibited sketches of a Saxon tombstone at Monkwearmouth, found in the repair of the church, and now preserved in the vestry. Mr. Cuthbert Bede described an early bronze stopper recently found in Rutland, and Mr. Saunders a copper coin, taken from the city wall of Hereford, and which was pronounced to be of Byzantine date. Mr. Horman-Fisher, F.S.A., produced a bronze bell, of German work. Mr. Chasemore described the discovery of flint-flakes on the banks of the Thames at Putney, and Mr. Worthington Smith exhibited several others from the northern heights of London, from positions fully 60ft. above the present level of the Thames. Among these was a pounder of grey granite found in a bed of sand 15ft. thick at Shacklewell. Mr. Roach Smith, F.S.A., sent sketches of some rare pilgrims' signs derived from a Continental source. Mr. Ferguson, F.S.A., produced a large collection of knitting-sheaths from the Wigton district, Cumberland. These archaic-looking instruments were much commented on, and the chairman pointed out the resemblance of some to the form of the knife on the Mithraic sculpture at Newcastle; while Mr. Geo. Wright, F.S.A., drew attention to their analogy to the Persian creases. Mr. Loftus Brock, F.S.A., described various fictile articles recently found in London. The Chairman exhibited a remarkable series of Venetian and other glass vessels of great beauty and value. The first paper was on the discovery of two Roman pottery kilns on West Stow Heath, Suffolk, by the finder, Mr. Hy. Prigg. These are of small size and of circular form. Many fragments of the wares made were exhibited. These were of light and dark pottery, and included a patera, with a potter's mark, of fine dark ware, very similar to Samian, except in colour. The second paper was by Dr. Stevens, of Reading, and was descriptive of some curious discoveries made while excavating in the River Kenneth at that time for a new bridge. Mediæval relics were met with; beneath these others of Roman date; while at the lowest level reached were many bones of pre-historic and extinct animals, with knitting implements of very remote age.

Manchester Architectural Association.—The last general meeting for this session was held in the Rooms of the Association on the 22nd inst., when the following members were elected as officers for the ensuing year:—President, James Murgatroyd, F.R.I.B.A.; vice-presidents, J. W. Beaumont, M.S.A., and Thos. Chadwick; secretary, John Brooke, 24, Barton-arcade.

COMPETITIONS.

Ayr New Hospital.—Last week the subscribers to the new hospital buildings fund received and considered a report by the referees, Professors Macleod and Gairdner, and Mr. Salmond, architect, all of Glasgow, to whom the competitive plans for the hospital had been submitted. All three concurred in placing first the plans submitted by Mr. Murdoch, of Ayr, but Mr. Salmond added a rider stating that in his opinion the carrying out of this design would cost £11,200, whereas the conditions prescribed the outside cost as £8,000. Mr. Murdoch stated that he would undertake to have his plan executed for a stipulated sum; and, after a discussion, the meeting was adjourned for two months to enable Mr. Murdoch to procure builders' tenders.

Brighton.—The names of the authors of the first and second premiated designs in this competition, of which we announced the result last week, are as follows: "Passing Away," Messrs. Simpson and Branch, 63, Ship-street, Brighton; "Shield with a Cross on it," Mr. F. J. Banister, 22, Great James-street, Bedford-row, W.C. As we mentioned in our last issue, the third premium has fallen to "Gravity," by Mr. J. M. MacLaren, of King William-street, Strand.

Castleford Cemetery.—The Castleford burial board recently advertised for designs for the laying out of the new cemetery. They received sixteen sets of plans and selected that bearing the motto "Ex Concesso," which proved to be by Mr. S. Wilkinson, surveyor, of Sowerby-bridge, near Halifax.

New Workhouse Infirmary, West Bromwich.—In the recent competition for the above the plans sent in were submitted to Mr. Yeoville Thomason, of Birmingham, to report upon. The design bearing the motto "Economy" was placed first, "Efficiency and Durability" second, "Perseverance" third. The guardians, however, reserving to themselves the right of final adjudication, awarded the first premium to "Economy," the second to "Perseverance," the third to "Efficiency and Durability." The authors of the designs were: "Economy," Mr. Henman, of Birmingham; "Efficiency and Durability," Mr. Edward Pincher, of West Bromwich; and "Perseverance," Messrs. Wood and Kendrick, of West Bromwich. The three premiated designs are to be submitted to the Local Government Board to recommend for execution. The three premiums were £60, £40, and £30, and the first will be forfeited to the board as liquidated damages in case no builder approved by the guardians can be found to execute the work according to design for the sum of £14,000.

CHIPS.

The town council of Leicester, at their meeting last week, appointed Mr. Griffith, who has been acting as engineer of floodworks, at a salary of £400 a year, as a resident engineer of the water undertaking, with a salary of £500 a year.

Steps are being taken at Goole, for the establishment of a school of art in that town.

The preparations for the commencement of the survey of Eastern Palestine are now complete. The War-office have granted to the committee of the Palestine Exploration Fund the services of Lieutenant Conder, who executed most of the survey of Western Palestine, and Lieutenant Mantell, both of the Royal Engineers. The work will be commenced in the North—the Land of Bashan.

Mr. H. Ingram was last week appointed surveyor to the local board of Littlehampton.

The town-council of Doncaster have adopted plans prepared by Mr. Bridge, engineer of the gas-works, for the construction of a large gas-tank and gasometer.

The construction of a line of tramways from Cardiff to the suburb of Grangetown was commenced last week. Mr. Jephson is the contractor.

A diocesan consistory court was held at Llandaff on Monday week, when a faculty was applied for for the restoration of St. Mary's Priory Church, Abergavenny, in accordance with plans prepared by Mr. Nicholson, architect, of Hereford. It is proposed to restore the nave and north aisle, at an estimated cost of £2,774, and the faculty was granted, power being granted to the restoration committee, if funds permit, to add two permanent porches at the west end. A faculty was also granted for the restoration of a further section of Christ Church, Newport, greatly injured by a fire some years since. Mr. Pritchard is the architect, and the present work will include the chancel, chancel aisles, and vestry.

The new town-hall for Wandsworth is rapidly approaching completion, and will soon be opened. The contractor is Mr. Parsons.

The local board of Brentford have received sixteen plans for the drainage of the district, offered in competition in response to advertisements, and last week decided in committee to call in an eminent engineer to advise as to the best and second best plans and the scheme most adapted to the requirements of the district.

On Thursday week, Earl Derby opened the new premises of the Oldham School of Science and Art, which have been erected by the Messrs. Platt Brothers, as a memorial of their late father, at a cost of nearly £10,000. On the following evening, Lord Derby distributed the prizes to the successful students in this school, and in the course of an address congratulated the school on its record of continuous good fortune, which was the evidence and result of good management.

A convent for nuns of the Order of the Perpetual Adoration is about to be built on the Corkly-hill, Maxwelltown, opposite Dumfries. Mr. Pugin, of London, is the architect, and the contract for building has been let to Mr. Develin, of Glasgow, whose tender, according to the *Glasgow Herald*, was £3,000 lower than the highest received.

A Hundred Thousand Replies and Letters on subjects of Universal Interest have appeared during the last ten years in the ENGLISH MECHANIC AND WORLD OF SCIENCE, most of them from the pens of the leading Scientific and Technical Authorities of the day. Thousands of original articles and scientific papers, and countless receipts and wrinkles embracing almost every subject on which it is possible to desire information have also appeared during the same period. The earliest and most accurate information respecting all new scientific discoveries and mechanical inventions is to be found in its pages, and its large circulation renders it the best medium for all advertisers who wish their announcements to be brought under the notice of manufacturers, mechanics, scientific workers, and amateurs. Price Twopence, of all booksellers and newsvendors. Post free 2½d. Office: 31, Tavistock street, Covent-garden W.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

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Front Page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No front page or paragraph Advertisement inserted for less than 5s.

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The charge for advertisements for "Situations Wanted" is One Shilling for Twenty Words, and Sixpence for every eight words after. *All Situation advertisements must be prepaid.*

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday. Front page advertisements and alterations in serial advertisements must reach the office by Tuesday to secure insertion.

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Mr. R. M. Tuttle, of 13 and 15, Laight-street, New York City, is authorised to receive American subscriptions at the rate of 6 dols. 40c. per annum.

Cases for binding the half-yearly volumes, 2s. each.

Received.—T. W. H.—M. M.—B. and B.—J. T. F.—T. P. L.

"BUILDING NEWS" DESIGNING CLUB.

Nil Desperandum No 2. (Your design arrived too late for review. The faults of the plan are the position and ventilation of the wards, and the other parts are not economical. As regards your second remark, that the almshouses illustrated resemble very closely the Rous Memorial Building, we cannot hold ourselves responsible for copyism.)—Ogmore. (Your design was irretrievable this time, and ought to have been named in the last group.)

Correspondence.

THE NEW PRESIDENT OF THE R.I.B.A.

To the Editor of the Building News.

Sir,—Mr. Horace Jones has been nominated by the Council of the R.I.B.A. for election as President for next session. Surely it is no disrespect to Mr. Jones personally to say that he is not the member of the profession best fitted for such a post. Certainly he is not at the head of it, nor even a leader. The names of many men better qualified will no doubt readily suggest themselves, and I cannot but think that it would be highly derogatory both to the Institute and to the profession if he were elected.

My purpose in writing, however, is to be allowed to remove two misapprehensions which, I find, extensively exist.

1st. That no other nomination can be made.

2nd. That even if it could, it would show a "want of confidence" in the present Council to do so.

To these I reply: That the nomination of the senior Vice-President is made by the Council under by-law 26, *which allows them no alternative*, and this shows how careful the Institute should be in the election of its Vice-Presidents.

Although thus nominated, the *election*, under by-law 25, is in the hands of the general body of Fellows, any two of whom may, under by-law 30, nominate any other Fellow for the office, provided such nomination is accompanied by the nominee's consent to serve if elected, and is sent to the secretaries of the R.I.B.A. at least four weeks before the date fixed for the Annual General Meeting (first Monday in May).

The meeting will this year be held on May 9th, so there is ample time for Fellows to exercise their privilege, and thus avoid what I cannot help thinking would afterwards be regretted.

To obviate the possibility of a technical difficulty, it would be desirable that nominations should be sent in fully four weeks before the *first* Monday in May, although the meeting does not take place until the *second*.—I am, &c.,

R. E. P.

THE INDIAN PUBLIC WORKS DEPARTMENT.

Sir,—I was in India at the same time as Mr. Binnie.

As far as I can remember, civil engineers made quite as many blunders as military engineers.

The system is, of course, full of red tape, like any other Government Department, and shows that the State is not a good agency for carrying on works requiring commercial tact.

The great defect I noticed was the very careless way in which estimates were prepared. As soon as work was begun, innumerable omissions and errors appeared; these, of course, led to endless correspondence.

The accounts are kept on a bad system—it seemed to me a perfect muddle.

As a rule, the works are not let to large, respectable contractors. The men who get contracts, very often very large ones, would never get a larger contract here than building farm-fences or carting stones.

They never had any securities. In putting a stop to work in India, the India Office did the best thing they have done for a long time.—I am, &c.,

A. G. Murray.

STRATFORD-ON-AVON CEMETERY COMPETITION.

Sir,—Replying to "A Competitor," in last week's Building News, full particulars of the Cemetery committee-meetings (from which my information was obtained) were given in the *Stratford Herald* of Feb. 4th and March 4th. This paper is published at 29, High-street, Stratford-on-Avon.—I am, &c., £1300.

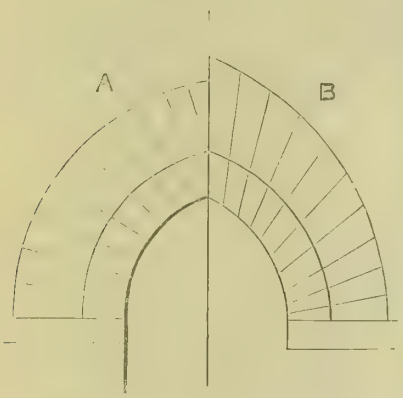
HYDRAULIC LIME WORKS AT MEUDON.

Sir,—I read with much pleasure the interesting article on the above, but I must add that I was just a little disappointed at finding the writer missed the application of the process in the case where I was most specially interested, for he prefaces his remarks by a very pertinent allusion to the unsuitability of the lime of the North of England for building purposes, which led me to hope his remarks would suggest some opening for improvement. But I note that the process is merely applicable for chalk-lime, where the material can be pulverised or dissolved previous to mixture with the clay and burnt together. In this district, *i.e.*, North Lancashire, Yorkshire, Westmoreland, and part Cumberland, all the limestone is the Carboniferous, hard as marble and inexhaustible in quantity; it is the richest lime in the world and invaluable for agricultural purposes, but for some reason the worst that could be used for buildings. It never properly dries in walling or plaster, and taken in connection with the excessive damp atmosphere and wet climate, it is not to be wondered at that our houses are damp and the people subject to pulmonary, rheumatic, and kindred diseases. There is a usual stage in the existence of a dwelling, commonly the second autumn, when the walls throughout are saturated with wet, often never remedied. The customary explanation is that the lime "gives," but this is now so usual as scarcely to be thought worth notice, a sort of providential arrangement which it is wrong to grumble at. But notwithstanding the old-fashioned prejudices of these districts for everything local and customary, I still think it would be well worth the while of any energetic party to give his attention to the production of a suitable and not too costly hydraulic lime. The clay, unfortunately, is difficult to get here, but it is simply a matter of a little railway carriage.—I am, &c.

March 23. B.

CHEAP CHURCHES.

Sir,—Your correspondent is justified in his remark as to the illustration of my window-arch. I can only say that it does not truly represent my drawing, and that I never have arches cut and gauged in that manner. I have *wide* joints for arches, often filled in with chippings, but I never put half-brick rings to carry two or three feet of wall. I inclose a sketch showing one half,



according to the illustration, and the other according to the original drawing (*a*, as drawn; *b*, as engraved).

It is well that attention should have been called to this representation of it. At the same time I cannot but think that "M." would have done better service with respect to the roofs if, instead of slashing away in the dark, and from behind the screen, he had given his own idea of what is strong, cheap, and beautiful, and compared the scantlings and quantities of the timber, span by span, with mine.

There is at present, so far as can be gathered from his letter, nothing to show that he really *knows* what mine are, any more than he was aware of the real construction of the arch. In any case he does not appear even to have inspected the drawings.

I am never above learning, and am grateful for instruction; but I confess to its coming with better grace if given in a kindly spirit, and in an open-handed way.—I am, &c.,

William White, F.S.A.

30A, Wimpole-street, 22nd March.

THE SUNDAY SOCIETY.

Sir,—We have the pleasure to announce that, through the liberality of Sir Coutts Lindsay, the Grosvenor Gallery has once more been placed at the disposal of the Sunday Society for two Sundays, and to-day it has been visited by the members of the Society between the hours of six and half-past eight.

Next Sunday the Gallery will be open to the public by free tickets, which will be forwarded to all persons who make a written application and send a stamped and addressed envelope to the honorary secretary, 8, Park-place Villas, W.—We are, &c.,

Dunraven, President.

Mark H. Judge, Honorary Secretary.

9, Conduit street, W., March 20.

CHIPPING NORTON CEMETERY COMPETITION.

Sir,—A short time since, a competition for a design for a cemetery chapel and gatekeeper's lodge, to be erected at Chipping Norton, was advertised in your paper, and drew 47 designs. I would suggest that if Messrs. K. W. and Co., the successful competitors, would publish their designs in one of the building papers it would be, I feel certain, to the satisfaction of the remaining 46 competitors.—I am, &c.,

One of the Forty-seven.

DISCONNECTING TRAPS AND THEIR VENTILATION.

Sir,—At p. 281, March 11th, Mr. E. G. Banner makes certain remarks regarding the application of disconnecting ventilating traps for soil-pipes, with some of which I can hardly agree

He says, e.g., "The trap should be a *close* trap," because if it is not it cannot be flushed properly, and also, when it snows, ventilation ceases.

Now, both of these objections are imaginary, and need not exist, nor do they in scores of cases where I have applied open traps myself. It is quite common to see the snow lying on the ground all around, and the ventilating openings of the trap clear. Further, for extreme cases, provision can easily be made to carry on the ventilation sufficiently, even supposing the grating be temporarily covered, by means of an extra air inlet pipe let into the wall, &c., so as to be above the snow, as, e.g., the following words from my patent of 29th November, 1877, refer to, viz.:—"Fitting a small inlet air-pipe to allow a free current to enter and ventilate the trap and all pipes connected therewith, even when the trap *is covered with snow*, or otherwise closed."

A close trap is necessarily difficult to get at, and as Mr. Banner refers to, also unnecessarily expensive. We ought to be able to examine the condition of the trap in a moment, and be also able to cleanse it easily, if necessary. To have to unscrew bolts and peer into the interior of the trap, like looking into the hold of a ship through a bull's-eye opening, is scarcely the thing.

As to Mr. Banner's assertion that "it is a fundamental error to suppose that there is a current of air up a vertical shaft, *per se*," I beg to state that, generally speaking, it would be a "fundamental error" to suppose there was not, in the case at least of inside soil-pipes, which have a communication at their foot with the open air. In the case of outside soil-pipes, however, matters are different; these are especially more needful of a ventilator placed upon them, both to help to produce an up-current and also as a preventive against down-draughts.

I do not approve of Mr. Banner's plan of contracting the outlet of his soil-pipe to only 2½in. diameter. For a good job, both the fresh-air inlet area at the foot and the foul-air outlet area at the top of the soil-pipe should be as large as the soil-pipe itself. Mr. Banner's small ventilating inlets and outlets are, I consider, serious mistakes, and especially for long soil-pipes.—I am, &c.,

Glasgow, March 21. W. P. Buchan, S.E.

EXTERNAL SOIL-PIPES.

Sir,—Mr. White's reference on p. 315 to the "difference between accretions caused by splashing and actual deposit" are not to the point, for it does not matter which of the two ways the "accretions" came so long as they were found to exist and to have a bad effect.

No one ever said, as Mr. White implies on p. 315, that "pure air passing through a pipe at an increased rate of two thousand per cent. should render the emanations more foul." The words are mere useless splashes—nay, more, Mr. White had no right to take up the space of the Building News with such nonsense.

As to Mr. White's closing words, "Danger from leakage is quite outside the question raised, and it may be met by isolation," I have to observe that he is wrong, both in his assertion and his remedy. Danger from leakage *is* one of the questions involved in deciding whether a soil-pipe should be outside or inside; and as to "isolation," while it is easy isolating the branch pipes when the vertical main soil-pipe is outside, the plan has yet to be discovered to satisfactorily effect that when the pipe is inside, i.e., keeping out of view the fitting up of the water-closets in a special wing erected outside of the main wall of the house, as per Fig. 281 of my own book on "Plumbing."

In regard to this question of inside and outside soil-pipes in this discussion, an engineer, whose name is not unknown in these pages, writes me this week, that while at one time in favour of outside soil-pipes, he was now in favour of inside ones, because the outside ones were apt to freeze when the valves were leaking. I shall not recapitulate what I have already said in meeting that objection; but he makes a new objection to the outside soil-pipe, viz., that the sun's rays, by beating upon it, would heat it up, and so make it as bad as an inside one in producing foul air and germs. Now, to this I would answer, that it would only be in certain positions and at certain times, now and then, that the sun's rays could affect a soil-pipe; moreover, it would so happen that while the sun's rays were heating up the soil-pipe and causing it to discharge more foul air and germs into the air, yet these same rays would, at the same time, kill these germs as they came forth into the sunlight and the open fresh air; so that sanitary science, I trust, shows this danger to belong to the region of the imaginary.—I am, &c.,

Glasgow, March 21. W. P. Buchan, S.E.

"ST. AUGUSTINE'S," OR "THE MAYOR'S" CHAPEL, BRISTOL.

Sir,—May I correct a slight error which appeared last week in the description of the "Mayor's Chapel, Bristol"?

Referring to an old sketch-book, I see, by a sketch which I made myself in 1873, that the building is dedicated to St. Mark, and not to St. Augustine, as would appear from Mr. Knapp's otherwise admirable sketch in last week's issue.

The mistake would probably have occurred through the close proximity of St. Augustine's Abbey, which building, however, is in no way connected with St. Mark's.—I am, &c.,

Bristol, March 22. E. Henry Edwards.

Intercommunication.

QUESTIONS.

[6441.]—**Roof Tiles.**—I am anxious to roof in a circular turret with tiles. Shall be glad to know if tiles are sold for this purpose, or are the ordinary tiles sold, cut to the radiating joint by the tiler when fixing?—Far Off.

[6442.]—**South Africa.**—Having read with great interest "R. H. H. H.'s" papers in this valuable journal, I should be glad if some correspondent could give information as to whether it is possible to procure a syllabus of the examination for "Government Surveyors."—Quid.

[6443.]—**South Africa.**—Having read with great interest the article on "Engineering in South Africa," by "R. H. H. H.," in this week's issue of the Building News, I should be glad if you, or any of your contributors, could inform me where further particulars are obtainable, both as to Government appointments and private practice, and more especially as regards the "Government Surveyors."—F. Ward.

[6444.]—**South Africa.**—Having perused with much interest your article on "Engineering in South Africa," I should like to put the following questions to the author:—To which instrument does he give the preference for colonial use, the Y or the Dumpy level? Should it have a compass attached to it? What is a convenient length for the staff? As regards the examination for the licence of a "Government Surveyor," what does the pure mathematics embrace?—C. E.

[6445.]—**South Africa.**—I have been reading your articles in the Building News on South Africa, and shall esteem it a favour if you can give me any information as to the opening there for a young architect and surveyor; whether Government appointments can be obtained; and, if so, how and whether such appointments are suitable for unmarried or married men, or both?—W. M. C.

[6446.]—**South Africa.**—To "R. H. H. H."—I have read your valuable article in this week's Building News with great interest, and more especially so as I am on the point of emigrating to South Africa, and I have ventured to ask you if you would kindly enlighten me respecting a point or two with which I am puzzled. I am anxious to procure, if possible, a situation in an architect's employ out there before starting, and I am at a loss how to proceed. Do you think I should be able to do so, and, if you do, would you be kind enough to tell me the best way to set to work? I am twenty-two years of age, and have been in the architectural profession nearly seven years. I have, for my age, had a very good experience, both practical and artistic, and am qualified to do any work in an architect's office. I am told there is an advertising medium at the Cape, through which most young fellows procure their situations out there. Am I rightly informed, and, if so, do you think it would be wise for me to advertise in it? If you can give me any assistance in this matter, you will confer a great favour upon one who is very anxious to make his way in the world, and who has no prospect of doing so in England.—W. G. S.

[6447.]—**Stucco Plaster.**—A plasterer became bankrupt, left a quantity of prepared plaster for the finishing coat on the job which has lain for six months. The new contractor states that the lime is not now fit for use. As a wide difference of opinion has arisen on this subject, I would feel obliged for an opinion through your paper from some competent authority.—Sam.

[6448.]—**Drain-Traps.**—Professor Reynolds, of Owens College, recommends a trap formed of bricks and cement, connected at each end with pipe drains. I fear the joint between the cement and stoneware must always be somewhat defective, and must tend, after a time, to cause obstruction. Can any reader who has used such a trap inform me if such obstruction has thus arisen, as I am thinking of using these traps?—Nemo.

[6449.]—**Discharge of Pipes.**—What quantity of water will each of pipes discharge if they are ⅝in. and ¾in. in diameter respectively, the head being 1,000ft. and the length two miles?—Zero.

[6450.]—**R.I.B.A. Exam.**—Will any reader kindly say which are the best text-books for "Material" and "Construction" in preparation for the R.I.B.A. Exam.?—X. Y.

[6451.]—**Local Board Surveyors.**—Will any of your readers be kind enough to inform me what may be the salary usually paid to the surveyor in a town of about 6,000 inhabitants, and whether it is customary for the surveyor to give the whole of his time to the duties of the Board, or to fill this office in conjunction with his own practice?—W.

[6452.]—**Self-acting Lever Ball-cock.**—Can any reader inform me of a self-acting lever ball-cock thoroughly to be relied on as drop dry for a reasonable number of years? Ball-cocks, as a rule, are exposed to continual trickling of the water, consequently the interior washers or parts of indiarubber or composition frequently require renewal. Do not some taps allow the water in the cistern to fall and then fill it immediately without the continuous running? Are not the working parts of some all metal? Often annoyance and expense is occurred, particularly in the case of tell-tale overflows and frost.—Architectus.

[6453.]—**Waterproofing Materials.**—Can any architect give me his practical experience of Szerelmey's waterproofing materials?—Architectus.

[6454.]—**Diameter of Pipe.**—Will any reader have the kindness to solve the following question or give some formula for same:—A straight pipe leading from a reservoir has to deliver 240 gallons per minute at a point 1,024ft. from the reservoir, and 64ft. below the surface of the water in it. Find the diameter required for the pipe.—Constant Reader.

[6455.]—**Norwegian Frame Houses.**—Can any reader give me particulars as to cost of Norwegian frame houses, and the method of constructing same, or supply me with the name of any firm who undertake this class of work?—H. W. K.

[6456.]—**Damp.**—The walls of my house, just above the skirtings are very damp, and I find that the walls have been constructed without a damp-course. As I do not wish to go to any great expense, I am thinking of cutting out the plaster where damp, and then coat the walls with silicate, and then replaster. Would this prevent the damp from showing through the paper?—Economy.

[6457.]—**Constants.**—In Banister-Fletcher's book on Quantities the cost of labour on fir frame framed in trusses is 1·70 hours per foot cube, to be multiplied by the rate per hour for a carpenter. Will any reader inform me what this means? I am told the builder is entitled to charge 1½d. per hour on a carpenter's wages, and calls it a "master's price." Which is the constant to be multiplied by? Dodson's book gives it at ·168 days per foot cube. How many hours are supposed to be a day's work? Is "labour and nails per square" a safer guide to value by?—W. G., Birkenhead.

[6458.]—**Extras.**—About twelve months ago I completed a contract, £3,000) building a country residence; the extras amounted to, say, £600. In due course the architect furnished his statement, and duly passed the work. I now have a balance due of nearly £200, a dispute having arisen relative to the work done. A clause in the agreement says, "Should any dispute arise between any of the said parties hereto the architects to be the sole arbitrators, and their decision shall be binding and final on all parties." I offered to rectify any defects, but the owner refus es to allow me even to inspect the alleged imperfect work, and the architect is with him. My question to you or any of you numerous readers is, In such a case, will the Court allow an architect to act as arbitrator, or will he be set aside for an independent person totally unbiased?—A 13 Years' Subscriber.

REPLIES.

[6423.]—**Chapel.**—If "Alpha" were to get up early some morning and sight the rising sun with two stakes, he would obtain an orientation for his chapel sufficiently accurate for all purposes. It is more than probable that such a proceeding is in accordance with the custom of the Mediæval builders. Mathematical exactness is the bane of modern architecture.—Quid.

[6428.]—**Oak Fittings.**—"B.'s" fittings, I should judge, were made from American white oak, much fancied by builders for sash frame sills, and called by the workmen sash sill oak. This is not half as durable as good Baltic fir. English oak is far too difficult to work for fittings of this description. When specifying again, say, "brown Riga wainscot," and see you get it, as there are four sorts of Riga wainscot, called English brown Riga wainscot, Dutch brown Riga wainscot, 1st brack Riga wainscot, 2nd brack Riga wainscot. The qualities being in this rotation, it requires great practice to distinguish between these three first. Cabinet-makers use the first two, but they also use a great deal of Stettin oak, and this, while much easier worked, matches the English oak more than the others, and is the most durable. A great deal is used by railway-carriage builders, and is the only oak that I would use for church-fittings, except English. The latter I prefer for the associations with old work. "B." can take this as the experience of one who has bought, converted, and used six to eight hundred logs in a year. In all good shops hard wood is left from the plane or cutting tool, no scraper or glass-paper, and it should be so specified. We are apt to forget the teachers, and assume that each of us do a certain thing that no one else does; but to Mr. Bayne, one of the clerks of works at the Houses of Parliament, Westminster, belongs the credit of beginning the rebellion against the scraper and sand-paper, so destructive to all form in mouldings and levels in surface wo.k.—Robert Phillips.

[6430.]—**Action of Frost on Mortar.**—In the case mentioned, the front should be well washed down to remove dust, and wet the brickwork. The joints should then be pointed in cement or a strong mortar made of stone lime, with a little sand.—Hugh McLachlan.

[6433.]—**Levelling—Reservoirs.**—The best book you can get for the use of architects, &c., is by McDonald, price 6d., Batsford, and "Waterworks," by Hughes, 4s., Lockwood and Co., will answer your purpose, I believe, on Reservoirs.—G. F. B.

[6435.]—**First Commissioner of Works Office.**—Yes to both questions. The vacancies are advertised.—Hugh McLachlan.

[6436.]—**Fence to Highway.**—In the case mentioned I should certainly take 1ft. of the "cop" as the boundary, from which I should build the wall.—G. F. B.

[6436.]—**Fence to Highway.**—A. is certainly right. I have never known a quick hedge planted to the extreme boundary of a property, and in surveying it is usual in cases similar to the one in point to compute the quantity not to the thorn quick, but to the foot of the cop, or edge of the ditch, as the case may be.—Land Surveyor.

[6436.]—**Fence to Highway.**—A. should build his stone wall in a line with the outside of his hedge when trimmed, cut, or pruned (say, a sufficient projection for the main branches), always bearing in mind that by 5 and 6 Will. 4th, cap. 50, section 68, and by 25 and 26 Vic., cap. 61, section 51, no fence can be erected within 15ft. of the centre of any highway. I cannot lay my hand on the clause now, but in one of the Highway Acts the highway is defined as the whole space between the hedges. In equity it is would be assumed that as no doubt the quick was planted zig-zag fashion, the outside stool would be on A.'s land.—Robert Phillips.

[6436.]—**Fence to Highway.**—In the case described, there is no doubt the centre of the quickset edge is the boundary. It is generally considered that property in a fence without a ditch is joint, if acts of ownership do not prove the contrary.—G. H. G.

[6438.]—**Architects' Drawings.**—Your agreeing to reduce the ordinary charge for the drawings does not, in itself, alter the ownership of the drawings. A verbal understanding that the plans were retained by you amounts to very little in law, though it ought to be ample between honourable men. It has been ruled that the architects' drawings cannot legally be retained by him if claimed.—G. H. G.

PARLIAMENTARY NOTES.

Civil Service Estimates.—The Committee of the House of Commons on Monday proceeded with the consideration of the Civil Service estimates, and voted £42,739 for the maintenance and repair of Royal palaces, and £2,397 for Marlborough House. On the vote of £110,926 for Royal parks and pleasure grounds, Mr. Henry Fowler (L. Wolverhampton) proposed a reduction of £10,000 as a protest against the taxation of the whole country for the support of London parks. A lengthened discussion ensued, in the course of which Mr. Shaw-Lefevre expressed the opinion that, considering the relation of the Metropolis to the country, it was but fair that the expense of the London parks should be defrayed out of the public purse, and on a division the amendment was negatived by 150 to 34. The following votes were also passed:—£33,260 for the Houses of Parliament, and £125,428 for public buildings.

Statue of Earl Russell.—Mr. Cavendish Bentinck on Monday asked the First Commissioner of Works whether the statue of Earl Russell, lately erected in the Central Hall, was to remain permanently on its present site; whether the site had been approved by the Department of Works, and whether, before approval the Department of Works had asked or obtained the opinion of the Royal Institute of British Architects, or of any other competent architectural authority, whether such a statue could be placed in the Central Hall without detriment to architectural effect; and whether the statue had been set up in the Central Hall at the public cost; and, if so, whether the sum necessary to defray this charge had been included in any estimate which had been laid before Parliament.—Mr. Shaw-Lefevre: The statue of Earl Russell was erected in the Central Hall in pursuance of the authority given in May, 1879, by the Deputy Lord Great Chamberlain on the application of the then First Commissioner, the right hon. member for Rutlandshire. Before that authority was given a model of the statue was erected on the proposed site, and received the approval of a committee composed of a number of distinguished persons, including the then Prime Minister and the present Prime Minister. The site was also approved by the late Mr. Edward Barry, the son of the architect of the building, and himself a distinguished architect, and who was generally consulted on matters affecting architectural changes in this building. No expense has fallen upon the Government in the erection of the statue. Under these circumstances it is not my intention to make any suggestion for the removal of the statue of this distinguished statesman.

Valuation of Land in England.—Mr. Ramsay last week asked the President of the Local Government Board whether, considering the general feeling in Scotland in favour of the Valuation Acts, under the provisions of which the value of all lands and hereditaments is annually ascertained with ease and accuracy in that country, Her Majesty's Government would consider the expediency of introducing the same system into England, and appoint a Select Committee to inquire and report as to the means by which such a change in the law of England might be best carried out, so as to secure a uniform valuation of all real estate throughout Great Britain.—Mr. Dodson: Although I have no reason to doubt that as the hon. member states the feeling in Scotland is in favour of the Valuation Acts in force in that country, I must remind him that in applying the system to England the feeling here has to be considered, and I am not aware of any desire whatever on the part of the ratepayers to have the system referred to applied to this country, where the local rates of all kinds have been always assessed upon rateable value as distinguished from the actual rental of the property. The effect of such a change would be to interfere most seriously with the whole incidence of rating, and I am not prepared to recommend the introduction of the Scotch system or to institute any especial inquiry with that view. At the same time, I am sensible of the advantage of uniformity attending the Scotch system, and I am in hope that substantial uniformity may be secured in England in a manner adapted to the habits and circumstances of the country.

Proposed Railway Extensions near N.W. London.—A Select Committee of the House of Commons, consisting of Sir J. Kennaway, Sir R. Cunliffe, Mr. Thornhill, and Mr. Henderson met on Wednesday to consider several important measures for extending the present railway system near London. The first Bill is promoted by an independent company, and seeks powers to construct a line from the Great Western station at Uxbridge to join the Watford and Rickmansworth Railway at Rickmansworth. The second Bill is promoted by the Great Western Railway, and is for precisely the same purpose as the first Bill, the proposed lines running side by side with one another. The next extension is promoted by the London and North-Western Railway to empower that Company to extend the Watford and Rickmansworth Railway in the same direction as that sought by the Metropolitan Railway, who are seeking by the next Bill to further extend their Harrow and Rickmansworth extension line to Aylesbury, and thereby establish a new communication with Birmingham. The last Bill in the group is to incorporate a company with powers to construct a railway from the Uxbridge branch of the Great Western line to Amersham and Aylesbury. Each of these Bills is opposed by the promoters of the other extensions, all of whom have presented petitions against one another.

LEGAL INTELLIGENCE.

Contractors and Contract Prices.—Caslake v. Bywaters.—This case, tried on Saturday in the Queen's Bench Division, in Banc, before Mr. Justice Watkin Williams and Mr. Justice Mathew, raised a question of some interest and importance, as to whether a person entering into a contract with builders to construct for him a house with all fittings, &c., is liable to pay them the full contract price, and also to pay the artificers employed in the building—in fact, as one of the judges observed, to pay twice over. The question had arisen in this way: A Captain Elliott had entered into a contract with Messrs. Bywaters, the builders, for the erection of the Beaconsfield Club, Pall-mall. The contract was entered into in the year 1876. By the contract Bywaters were to complete the contract works to the satisfaction of Mr. Dudley, the architect, for £24,359, extras (ordered in writing by the architect) to be allowed for at measure and value, "at the prices in the bills of quantities," the specification setting forth every particular, even to dressers, &c., but providing that for certain things, as bells, &c., certain sums were to be allowed, such provisions to be at the disposal of the architect, who, as to these provisions, was to employ such persons as he might think proper to carry out the works, the amounts to be deducted from the contract. The plaintiff had supplied certain gas fittings, &c., wholly ignorant of the terms of the contract, but aware that the builders were contractors; and the question was whether the defendants had contracted with the plaintiff. The gasfitting was included in the provisions referred to. The plaintiff had done the gas-fitting in the house, and it appeared that he was selected by the architect, but was sent for by the builders, and had his directions from them, the architect only certifying the amounts payable to the contractors from time to time, including the gas-fitting, as well as other heads of work; and then Bywaters, the contractors, paid the gas-fitter with the other artificers, and had thus paid the plaintiff a certain amount. Difficulties, however, arose, and the plaintiff brought an action in 1877 against Captain Elliott for the amount remaining due to him—£1,300; but he discontinued that action under advice, and brought this action against the contractors, and in the meantime they had sued Captain Elliott for the arrears due to them under the contract, including this claim, and they obtained judgment for the amount, £1,200. The present action—the gas-fitter's action—against the contractors was tried before Mr. Justice Stephen, and, after a trial lasting three days, he obtained a verdict. This was an application on the part of the defendants to set aside the verdict as against the evidence, and also on the ground of misdirection as to the effect of the contract, and this had been fully argued. The argument for the contractors was that under the contract the architect was to select the artificers, and amongst others, the gas-fitter, and that therefore, Captain Elliott was their employer, and was to pay them, the provision referred to taking them out of the contract. The argument on the other side was that this could not be, for, if so, then Captain Elliott would pay twice over, as the contract price included everything. The Court came to the conclusion that the verdict ought not to be disturbed, and so they gave judgment for the plaintiff. Mr. Justice Watkin Williams, in giving judgment, said the question, no doubt, was one of considerable importance, whether the artificers employed were to recover from the contractors or the contractors' employer. The question was whether the plaintiff, as the gas-fitter, had been employed by the contractors, the defendants, so as to make the defendants liable to him, or whether the plaintiff had contracted only with Captain Elliott. The evidence was not very clear; probably if it had been this question would not have arisen. The plaintiff stated that he had been brought on to the premises by Bywaters, who wrote to him telling him that he was selected, and that he had his directions from them. The contract indicated that Captain Elliott was to pay them for everything on certificates of completion to certain amounts. The architect appeared also to have given Bywaters certificates to enable them to know what sums they were to pay to the artificers. Thus it was that certificates had been given to Bywaters as to Caslake's work with others, and the amounts were

paid on these certificates by Captain Elliott. The question was whether there was an employment of Caslake by Bywaters. Caslake knew nothing of the terms of their contract, and only knew that they were contractors. Was there evidence that Bywaters employed Caslake? Their contention was that they only employed him on behalf of Captain Elliott as the common employer, who ultimately paid. His case was that they employed him, and that he received his directions from them, and that all that the architect did was to certify what sums they should receive from Captain Elliott. The contract between Bywaters and Elliott threw no light on the question whether or not they employed Caslake or any other particular artificer. That question would depend upon what passed between the parties, and, in truth, the contract was rather against Bywaters, for it showed that Captain Elliott had contracted to pay them the very sum of money claimed by the plaintiff and other artificers. "All provisions to be at the disposal of the architect" did not mean they were to be taken out of the contract, but only that the architect as to these things was to have the privilege of choosing the artificers. Then as to the conduct of the parties, it appeared to bear out this view; for though Caslake had first sued Captain Elliott, he was advised to and did drop it as untenable, and Bywaters had obtained judgment against Captain Elliott for these very moneys. It was clear that the parties understood that the artificers were to be employed and paid by Bywaters, who were to receive the entire amount from Captain Elliott. The verdict, therefore, did not appear to be wrong, but rather to be right, and this application for a new trial must be dismissed. Mr. Justice Matthew concurred. The application for a new trial was accordingly dismissed, subject to appeal.

The Commissioners of Works and Public Buildings and Dalton v. Angus and Co.—This was an appeal brought by the appellants, the defendants below, against an order of the Court of Appeal reversing a decision of the Queen's Bench Division, setting aside a verdict in favour of the respondents, the plaintiffs below. The respondents, Messrs. Angus and Company, are coachbuilders at Newcastle-on-Tyne. In 1849 they converted a dwelling-house in the Westgate-road into a coach factory and warehouse. In the process of conversion they removed the internal walls of the building and erected on their own soil close to and in contact with the adjacent premises since purchased by the appellants, the Commissioners of Works, a large stack of brickwork, serving the twofold purpose of a chimney-stack and of a support to the main girders which had to be put in to sustain the floors. These girders were inserted into the stack on the one side, and into the respondents' wall on the other, and formed the main support of the upper stories of the factory. The respondents made these alterations without any direct grant from the owner of the adjoining premises of any right of lateral support, or any assent on his part to the use of such support, or knowledge that the same was in fact enjoyed. The appellants, the Commissioners of Works and Public Buildings, having purchased the adjoining house in order to erect a Probate Office on its site, contracted with Mr. Charles Dalton, the other appellant, that he should execute the proposed works for them. By the contract and specification so entered into, it was provided that the contractor should erect and complete the work and all things necessary to be done in and about the same in a thoroughly substantial and workmanlike manner, conformably to the specification and general conditions, and that he should shore up the adjoining buildings, and make good all damage that might be caused thereto during the progress of the works. Mr. Dalton, in the course of the execution of the work, excavated the ground adjoining the respondents' premises, leaving a thick pillar of clay round the respondents' stack of brickwork for its support, and also placed shores to support the respondents' building. Notwithstanding these precautions, however, the ground beneath the chimney-stack gave way, and the respondents' building, losing its main support, fell. The respondents thereupon brought an action against the appellants (the Commissioners) and the contractor for the loss occasioned by the fall of their building, which was tried at the Newcastle Summer Assizes, 1876, before Mr. Justice Lush and a special jury, when a verdict was found for the plaintiffs, with £1,943 damages. On the case coming before the Queen's Bench Division for judgment, the Lord Chief Justice and Mr. Justice Mellor, Mr. Justice Lush dissenting, decided that the plaintiffs had no right to the lateral support of the adjacent soil, and gave judgment in favour of the defendants. That judgment, however, was reversed by the Court of Appeal, consisting of Lord Justice Cotton and Lord Justice Thesiger, Lord Justice Brett dissenting. The appeal from the judgment of the latter Court was partly argued before the House of Lords in November, 1879, when their lordships directed that the cause should stand over until the learned Judges could attend to assist the House with their opinion on the questions of law raised. In November last the appeal was re-argued before their lordships, assisted by the above-named Judges, who then requested time to consider their opinions on the questions of law which their lordships put to them. On Thursday week the learned Judges delivered *seriatim* very long and elaborate opinions, which occupied three hours in reading. It was understood that the learned Judges were almost equally divided in opinion on certain of the questions which had been submitted to them. Lord Coleridge, on behalf of the House, thanked the learned Judges for their careful and elaborate opinions, which were ordered to be printed, and the further consideration of the case was then adjourned *sine die*.

STATUES, MEMORIALS, &c.

Cleopatra's Needle.—On Saturday last a number of people assembled at the Eccleston Iron Works, Pimlico, to witness the casting of the first of the two bronze sphinxes which are to be placed one on either side of Cleopatra's Needle on the Victoria Embankment. The sphinxes have been designed by Mr. Vulliamy, and, when completed, will be placed at the base of the needle in line with the Embankment, one looking towards Westminster and the other towards the City. Each sphinx will be 19ft. long by 6ft. wide, and 9ft. high over all, and will weigh about seven tons. The metal used is composed of 90 parts copper, and 10 parts tin, about eight tons of metal being run for each figure to allow for waste. The mould in which the figure was cast was 20ft. long, 10ft. deep, and 6ft. wide, its approximate weight, including the core, being 150 tons. On Saturday the cupola containing the molten metal, at a temperature of 2,000° Fah., was tapped soon after half-past 12, the bronze being run into a 10-ton ladle. Shortly before 1 o'clock the molten contents of the ladle—eight tons—were successfully transfered to the mould, the running temperature being reduced to about 1,950° Fah. The run having been successfully effected, the visitors were shown the four wings, which are to be placed one at each angle of the obelisk where it rests on the masonry base. There were also designed by Mr. Vulliamy as well as the four filling pieces between the wings. Each of the filling pieces represents the cartouche of Thothmes III., the insignia being the sun, a draftboard, and a beetle. In addition to these the visitors were afforded the opportunity of examining the two cast-iron lamps standards, each 18ft. high, which are to be placed on the two sanctuaries in Northumberland-avenue, and surrounded by four dwarf posts of corresponding design.

Glasgow.—A niche in the hexagonal tower of the new Asylum for the Blind, Glasgow, was last week enriched with a group of statuary representing our Saviour restoring sight to the blind. The figure of the Saviour, which is of heroic size, is seated, with the right hand raised in the act of benediction, while the left is placed on the head of a kneeling youth with upturned face, in the act of prayer. The treatment of the drapery and accessories is Mediæval, in keeping with the architecture of the building, which has been designed by Mr. W. Landless. Mr. Chas. B. Grassby, of Glasgow, is the sculptor, and the group is a presentation to the managers of the Institution by Mr. Charles Tennant, M.P.

WATER SUPPLY AND SANITARY MATTERS.

Hanley.—The opening of the works for the purification of the sewage of the borough of Hanley took place on Thursday week. The sewage of the borough, with the exception of a very small area, is intercepted and conveyed by gravitation to a convenient portion of the Trent Hay Farm, where it is dealt with by precipitation and filtration. The cost of the drainage and other works, with the purchase of 23 acres of land, has exceeded £62,000. The works have been carried out from the plans and under the supervision of Mr. Lobley, borough engineer, Hanley.

Chelmsford.—An inquiry was held last week at Chelmsford, before Mr. S. J. Smith, C.E., one of the inspectors of the Local Government Board, as to an application from the Chelmsford local board of health for permission to borrow a further sum of £13,000 for sewerage works, and of £2,000 for the new market, in addition to the sums of £8,700 and £13,000 respectively borrowed for these objects. After hearing evidence, the inspector visited the sewerage works, when he expressed an opinion that the number of sub-soil drains was insufficient, and that the area under filtration ought to be increased. He therefore recommended that the board should borrow £14,000 instead of £13,000 for the sewerage. At a special meeting of the local board since held, this was acceded to by a majority of one.

Our Office Table.

A Parliamentary paper was issued on Saturday last giving the annual report of the directors of the National Gallery for 1880. The pictures purchased during the year were—St. Sebastian, by Bernadino Cotignola; and the Virgin and Child with the infant St. John and an Angel, by Leonardo da Vinci. There had been many bequests: by Mrs. Joseph Henry Green—the Deposition from the Cross, the Adoration of the Kings, the Head of St. John the Baptist with Mourning Angels, Portrait of a Man in an attitude of prayer, the Visitation of the Virgin to St. Elizabeth, Christ Crowned with Thorns, the Flight into Egypt, the Virgin and Child with other figures, Christ appearing to the Virgin Mary, the Mocking of Christ, the Crucifixion, the Virgin and Child with St. Elizabeth. The late Mr. P. F. Poole, R.A., bequeathed "The Vision of Ezekiel," by himself. The presents were: by Mrs. Robert Holland, Pan and Syrinx, by François Boucher; by the Trustees of the British Museum, Portrait of a Man, attributed to Sir A. More; Portrait of Anna Maria Schurmann, by Jan Lievans; a hunting scene by Jan Weeninx; and a landscape attributed to R. Wilson, R.A. The loans were: by the Duke of Norfolk, Portrait of Christina of Denmark, Duchess of Milan, the work of Hans Holbein; and the Colonna Raphael, belonging to the Duke of Ripaldi. The total number of pictures now contained in the public rooms of the Gallery, exclusive of water-colour drawings, is about 1020. The alteration of the ceiling and skylight in the Turner Gallery is earnestly commended to the attention of her Majesty's Treasury. There are now 639 pictures protected by glass. The gallery was visited during the year by 1,036,125 persons, and the total number of students attending the gallery was 22,622.

It was stated at a recent meeting of the Stoke-upon-Trent Town Council, on Thursday, that the profits of the Stoke and Fenton gasworks for the past year amounted to four thousand seven hundred pounds, and the Stoke share of this surplus is equal to a rate of something like two shillings in the pound, so that the financial advantage to a town of supplying itself with gas is very considerable. The adverse to the bright side of the picture was referred to by the mayor, who, while believing it would be a long time before the electric light would take the place of gas in private house, regarded the spread of the brighter illuminating power in lighting larger spaces and public buildings as inevitable. It is just possible, therefore, that the time may not be very far off when the acquisition of gasworks by governing bodies will not be such an object of anxious desire as it often is now, and when those towns which have been unable to persuade their gas companies to part with their property may congratulate themselves upon their want of success rather than lament it.

A plan is proposed by Mr. Charles Waring for the construction of a central railway terminus at Northumberland Avenue, to which are to be brought the trains of the North-Western, the Great Western, and the South-Western Railways. His plan is to bring the North-Western and the Great Western trains from Willesden along the existing West London Railway down to a point close to Battersea Bridge, thence to carry them by a new railway under the Chelsea Embankment, under the new embankment which is projected by the Metropolitan Board of Works from the Vauxhall Bridge-road to the Houses of Parliament, and thence alongside of the present Metropolitan District Railway to Northumberland Avenue. The South-Western would be brought to the same point by a new bridge across the river half-way between Vauxhall and Victoria bridges. Mr. Waring proposes to build his new station on that piece of at present vacant ground belonging to the Metropolitan Board of Works which abuts on the Northumberland-avenue and Whitehall-place. It will be more than double the size of the existing Charing Cross station. Mr. Charles Barry is associated with the work as architect, and Mr. J. Wolfe Barry and Mr. Aitken as engineers. A conference on the subject of the proposed station has, it is stated, already been held at the Metropolitan Board of Works, when Mr. Waring stated that he was prepared to purchase the necessary land and privileges from the Board, and to lodge a Bill in the next session of Parliament asking for authority to carry through the enterprise.

At a meeting of the committee of the Sunday Society this week, at 9, Conduit-street, a report about public work being carried on in the City last Sunday was considered and the following resolution adopted, viz., "That the Right Honourable the Lord Mayor, M.P., be requested to bring the following resolution before the next meeting of the Court of Common Council, viz.: 'That the committee of the Sunday Society having learned that workmen were employed yesterday (Sunday) in some of the principal thoroughfares of the City in fixing the apparatus for electric lighting, desire to express their disapproval of such work being performed on Sundays, and, on the ground that it would endanger the preservation of Sunday as a day of leisure, when the mass of the population are able to avail themselves of the elevating influences of Religion, Science, Literature, and Art, this committee trust that the Court of Common Council will take such steps as may be required to prevent a repetition of such unnecessary work.'"

It is proposed by the Lords of the Committee of Council on Education to hold a special loan exhibition of Spanish and Portuguese ornamental art in the South Kensington Museum during the coming summer months. The Committee of Advice has been formed, and the first meeting, at which His Royal Highness Prince Leopold, K.G., presided, took place on Saturday, the 19th inst., in the museum. The Lord President of the Council, Earl Spencer, K.G., and the Vice-President of the Committee of Council, the Right Honourable A. J. Mundella, M.P., received His Royal Highness.

The question of the reconstruction of the Tay Bridge continues to engage the attention of the North British Railway directors, and they believe that the bridge finally decided upon is the best possible under all the circumstances. It provides for the navigation of the river with spans of a width of 245ft., the greatest height being, from high water to the under side of the girders, 62ft., as against 88ft. in the old bridge. The line of the bridge will be a uniform gradient, varied considerably, being in one part as severe as one in 74 north of the four navigable spans. There were in the old bridge nine other large spans. In the new bridge these will be replaced by eighteen spans of half the old dimensions, the girders being placed below instead of above the rails as before. Each of the piers will be of brickwork and concrete up to eight and a half feet above high water, and of plated wrought iron from that level to the under side of the girders. The termination of the bridge at each end will be by brick arching, and a substantial parapet will be erected throughout its entire length. Many suggestions have been made for the utilising of the old foundations, which in themselves are quite capable of sustaining the weight of the superstructure; but the insuperable objection to their use lies in the fact that they were liable to scour, and this, in the new bridge, would be prevented by making the foundations, except those in rock, 20ft. below the bottom of the river, where they will be beyond the reach of any possibility to scour.

The death is announced of Mr. William Wailes, the well known artist in stained glass, of Gateshead-on-Tyne. The deceased was the son of a former steward of the Greenwich Hospital estates at Dilston, and was born at Newcastle. Half a century since he carried on business as a grocer and provision dealer, but occupied his leisure hours in the study of the art of staining glass. In order to see the best specimens of windows, Mr. Wailes spent some time in visiting the cathedrals and principal churches of the Continent, and on his return commenced buisness in Newcastle as an artist in stained glass. His fame became world-wide and his works are to be found not only throughout Europe, but in India, America, and Australia. He had a family of a son and two daughters, one of whom married his partner, Mr. Strang. Mr. Wailes was 72 years of age at the time of his death.

A new method of protecting iron from the effects of the atmosphere has been devised by a Mr. Ward. The new process consists in the combined application of silicates and heat, and is termed the "inoxydising" process. This is the basis of several subsequent processes for ornamenting the surface of the metal. The inoxydising process consists in coating the cast or wrought iron objects with a silicate composition, which is applied either by means of a brush or by dipping the iron in a bath of the solution. The coating quickly dries upon the objects, which are then passed through a furnace heated according to the nature of the articles under treatment. The silicate composition is thus fused and absorbed into the pores of the metal, becoming homogeneous with it. Upon cooling the articles treated are found to be covered with a dull black coating, which, it is stated, is found not to suffer change from long exposure to the atmosphere, nor to disintegrate or separate from the surfaces to which it has become applied. The ornamentation is effected by coating and furnacing the articles by the combination of the silicate composition with vitrifiable colours.

Throat Irritation.—Soreness and dryness, tickling and irritation, inducing cough and affecting the voice. For these symptoms use Epps's Glycerine Jujubes. Glycerine, in these agreeable confections, being in proximity to the glands at the moment they are excited by the act of sucking, becomes actively healing. Sold only in boxes, 7½d. and 1s. 1½d., labelled "James Epps and Co., Homœopathic Chemists, London." A letter received: "Gentlemen,—It may, perhaps, interest you to know that, after an extended trial, I have found your Glycerine Jujubes of considerable benefit (with or without medical treatment) in almost all forms of throat disease. They soften and clear the voice. In no case can they do any harm.—Yours faithfully, Gordon Holmes, L.R.C.P.E., Senior Physician to the Municipal Throat and Ear Infirmary."

CHIPS.

A public meeting of the citzens of Dublin was held on Monday, to consider the site for the proposed Science and Art Museum. The claims and disadvantages of Merrion-square and Kildare-street having been discussed, it was decided to memorialise the Government in favour of the latter site. Satisfaction was expressed by several speakers that the Government had promised to throw open the competition for the proposed buildings to Irish architects.

A loan exhibition of ancient and modern art needlework is to be held in St. Patrick's hall, Dublin, from Thursday, April 28th, till Saturday, May 7th.

Memorial-stones were laid at Dawlish, on Thursday week, of New Wesleyan Sunday-schools, in course of erection at a cost of about £450. Mr. Delbridge is the architect, and Messrs. Hawkins and Lamacraft are the builders.

A new Wesleyan chapel was opened at East Grinstead on Wednesday week. The architect is Mr. Haughton, and the builders are Messrs. Charlwood Brothers; the cost has been about £1,800.

A fire broke out on Thursday morning week in a pile of deals on the premises of Messrs. Bartram and Prout, timber merchants, Belvedere-road, Lambeth, and was not extinguished till considerable damage had been caused. On examination it was found that the deals had been saturated with paraffin oil, and near by was discovered some matches and a large bottle containing a little paraffin.

The Government have accepted the tender of Messrs. Robert Neill and Sons, of Manchester, for the erection of the new Post-office in that city. Mr. Williams, of the Office of Works, London, is the architect. It is expected the building will be completed in about three years, the date named in the conditions of contract being May 1, 1884.

The Whitechapel district board of works proceeded on the 14th inst. to elect a surveyor in succession to the late Mr. S. W. Iron. From amongst 67 candidates, Mr. La Riviere, assistant surveyor, was appointed by 28 votes, as against 26 votes received by Mr. D. J. Ross, one of the principal assistants in the City Commissioners of Sewers' office.

A first meeting of creditors of William John Hutchings and William James Berry, builders and contractors, of Honiton, was held on Monday week, at Exeter. The statement of affairs showed total liabilities £1,819 14s. 1d.; total assets, £594 4s. 5d., and the debtors offered a composition of 5s. in the pound. Liquidation by arrangement was resolved upon, and a committee of inspection was appointed.

A new Congregational Chapel is about to be built at Mevagissey, Cornwall, from the designs of Mr. Silvanes Trevail.

A tender has been accepted, at £1,447, for the erection of a U.P. church on the island of Sanday, Orkney.

Messrs. Protheroe and Morris have to-day removed from 98, Gracechurch-street, E.C. (which premises are required for City improvements) to more commodious offices at No. 8, New Broad-street, E.C., close to the Broad-street and Liverpool-street termini, and two doors from the Bishopsgate (Metropolitan) station.

The seat of the Hartopp family at Four Oaks-park, near Sutton Coldfield, has been reopened, after conversion into a race-course, at a cost exceeding £100,000. The old hall has been left as a centre-piece to the track, which is oval in form, and 1½ miles in circuit. Five blocks of stands have been built in brick, stone, and iron, having plate-glass windows and screens to the principal floors, and these including the accommodation on the flat roofs provide room for over 4,000 spectators. Mr. W. Jenkins, of Bennett-hill, Birmingham, has been the architect, and personally supervised the operations; the contractors were Messrs. Surman and Sons, of Great Colmore-street, Birmingham.

The memorial-stone of a Primitive Methodist chapel was laid in Commercial-road, Bournemouth, on Wednesday week. The building will be Gothic in style, will have a frontage of Bath-stone, and is to seat 200 persons. The cost will be about £900. Mr. H. E. Hawker is the architect, and Mr. Joy the contractor.

A group of Good Templars' buildings were inaugurated at Paisley on Monday. They are Classic in style, are built of local stone, and consist of a main hall, 75ft. by 40ft. and 45ft. high, seating, inclusive of horse-shoe gallery, 1,000 persons; at the rear are two rooms, each seated for 100 persons, and beneath two smaller halls and several minor rooms. Messrs. Rennieson and Scott, of Paisley, are the architects, and Mr. James Barclay, of Paisley, took the principal contract for building. The cost has been about £7,000.

A new district church of St. Thomas is being built at Derby from the designs of Mr. Joseph Peacock, of Bloomsbury-square, London. It is Norman in style, and consists of nave and north and south aisles under three gable roofs, and without clerestories, and a square-ended chancel. The aisle and chancel windows will be round-headed without mullions or tracery, and at the eastern and western gables will be wheel-windows. The walls will be of hard brick, faced outside with Coxbench stone, and lined inside with cement. Open seats of pine will accommodate some 600 worshippers. The church is to be opened at Michaelmas next.

A new high altar was consecrated on Saturday at St. Joseph's Roman Catholic Church, Elmgrove, Brighton. It is constructed of white marble, was designed and erected by Mr. Herbert, of Liverpool, and has cost £800.

A school of art is to be opened at Bedford, in May, under the chairmanship of the head master of the Bedford Grammar School.

The Devonport town council have decided to purchase the Mechanics' Institute in that town, including its property, for the purposes of a free library at a cost of £2,500.

The annual meeting of the Kent Archæological Society for this year will be held at Canterbury about the end of July, and a visit will be made to Wingham on the second day of the meeting.

Mr. F. S. Downs, of Hadleigh, Suffolk, who had been surveyor and inspector of nuisances to the local board of that town since its formation, died suddenly on Tuesday week.

The corporation of Chard, Somerset, have resolved to adopt the sodium process for the treatment and disposal of sewage. The system is the invention of Mr. J. H. Smith, borough surveyor of Taunton, and has been in use in that town for some time.

A new Wesleyan chapel was opened in Church-street, Ashborne, on Tuesday. It is Grecian composite in style, and is of brick, with Stanton stone dressings and mouldings. It measures 69ft. by 36ft. 6in., and beneath the chapel itself are a schoolroom, 44ft. by 37ft., infants', and three class-rooms, chapel-keeper's lodge, and vestries. The chapel is seated in pitch-pine for 500 persons, with provision for a future gallery. Behind the rostrum is an apsidal domed orchestra. Mr. John Wills, of Derby, is the architect, and Mr. George Pemberton, also of Derby, the builder; the total cost has been about £2,000.

The local board of Wellington, Salop, have arranged terms with the local water company for the transfer of their waterworks and undertaking to them, as the urban sanitary authority, for £12,000.

Mr. Wm. Crank, sewer contractor, of Bolton, committed suicide on Wednesday week by hanging himself. At the inquest it was stated that deceased was depressed in spirits on account of a dispute with the contractor for a new gasometer for Bolton, for which he had taken a sub-contract at a schedule of prices for excavations. He left a written paper declaring that his act was not rash, as it was "to heal a broken heart caused by injustice." A verdict of suicide whilst in a state of temporary insanity was returned at the inquest.

At Tighnabruaich, N.B., on Saturday, the memorial stone was laid of a new hall to accommodate 200 persons. Mr. Smellie, of Partick, Glasgow, is the architect.

Mr. Thomas Thurstow, of Ashford, East Kent, died on Friday, at the age of 82. For very many years he had been one of the principal road surveyors in Kent, and a great many of the turnpike

highways were under his management. He surveyed much of the line of the South-Eastern Railway Company, and for some years was surveyor to the Ashford Local Board.

Four iron piers are being built at the present time at the Britannia Ironworks, Derby, for a bridge to cross the river Indus, at Attock, to carry the Northern Punjab Railway extension. The piers are all of wrought iron, each 21ft. 6in. wide at top; Nos. 1 and 2 are each 132ft. high and 66ft. wide at base; No. 3, 109ft. high and 55ft. wide at base; and No. 4, 86ft. high and 47ft. 6in. wide; they weigh respectively 300, 300, 250, and 100 tons. The bridge will be of steel girders, carrying a line of rails, 5ft. 6in. gauge, at the top and a roadway underneath. The engineer is Mr. A. M. Rendel, C.E., of Great George-street, Westminster.

The Hendon local board of health have elected as surveyor Mr. J. Pollard, an assistant in the engineer's department of the Metropolitan Board of Works.

The Sir Gilbert Scott memorial brass, designed by Mr. Street, R.A., for Westminster Abbey, is just being completed, and it will be on view very shortly at the Royal Architectural Museum for a few days before being fixed in its place. Of this due notice will be given by an advertisement in our pages.

The new free library and Hastings memorial museum at Worcester were opened on Wednesday by Mr. J. Russell Lowell. They have been erected from the designs of Mr. R. Knill Freeman, of Bolton and Derby, selected in competition. The contractors were Messrs. Wells and Son.

The parish church of Norrieston, Perthshire, has just been restored from the designs of Mr. J. M. MacLaren, King William-street, Strand, London. The interior has been entirely remodelled, and a richly-designed pulpit, with carved canopy over, replaces the old one. Decorations have been carried out on an extensive scale by Mr. Miller Stirling, from drawings supplied by the architect.

ROYAL INSTITUTE OF BRITISH

ARCHITECTS.—The Tenth Ordinary Meeting of the Session will be held on MONDAY evening, 28th inst., at 8 p.m., when, after the names of Candidates recommended for admission have been announced, a Paper entitled "HISTORICAL DOCUMENTS" will be read by J. J. Stevenson, Fellow. The paper treats principally of the modern practice of Restoration.

J. MACVICAR ANDERSON, Hon. Sec.
WILLIAM H. WHITE, Secretary.
9, Conduit-street, Hanover-square, London, W.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Royal Institute of British Architects. "Historical Documents." By J. J. Stevenson. 8 p.m.
Society of Arts. "The Scientific Principles Involved in Electric Lighting." By Prof. W. G. Adams, F.R.S. 4th and concluding Cantor Lecture. 8 p.m.

TUESDAY.—Institution of Civil Engineers. Discussion on paper by D. Phillips, on "The Comparative Endurance of Iron and Mild Steel when Exposed to Corrosive Influences." 8 p.m.

WEDNESDAY.—Society of Arts. "Recent Advances in Electric Lighting." By W. H. Preece, M.I.C.E. 8 p.m.

THURSDAY.—Royal Institution. "Ornament." Lecture No. 3. By H. H. Statham. 3 p.m.
Civil and Mechanical Engineers' Society. "Lifts." By G. J. Child. 7 p.m.
St. Paul's Ecclesiological Society. "Baal Worship and Baalitic Practices Connected with Modern Times." By Rev. S. M. Mayhew, M.A. 7 30 p.m.

FRIDAY.—Architectural Association. Special business meeting. 7 p.m. "Settlements." By L. C. Riddett. 7.30 p.m.
Royal Institution. "The King in His Relation to Early Civic Justice." By Sir H. S. Maine. 9 p.m.

Lamplough's Pyretic Saline is refreshing, most agreeable, and the preventive of FEVERS, BILIOUSNESS, SMALL POX, SKIN DISEASES, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill. *Use no substitute* —[Advt.]

Holloway's Pills.—These famous Pills purify the blood, and act most powerfully, yet soothingly, on the liver, stomach, kidneys, and bowels, giving tone, energy, and vigour to the whole system. They are wonderfully efficacious in all ailments incidental to females, and, as a general family medicine, are unequalled.

Trade News.

WAGES MOVEMENTS.

HAWICK, N.B.—The strike in the building trade, after being continued for a fortnight, was settled on Saturday by the masters conceding the demand of the men for an advance of wages from 6½d. to 7d. per hour.

McLACHLAN & SONS, 35, St. James's-street, S.W. Builders, Decorators, and House Painters. Designs and Estimates.
General Repairs and Alterations Executed. Experienced Workmen always in readiness, and sent to any part of the country.—[Advt.]

Doulting Freestone and Ham Hill Stone of best quality. Prices, delivered at any part of the United Kingdom, given on application to
CHARLES TRASK,
Norton-sub-Hamdon, Ilminster, Somerset.
—[Advt.]

BATH STONE.
BOX GROUND,
THE BEST FOR ALL EXTERNAL USE.
CORSHAM DOWN
CANNOT BE SURPASSED IN BEAUTY OF APPEARANCE FOR INTERIOR WORK.
PICTOR & SONS, BOX, WILTS.
[Advt.]

TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender—it adds to the value of the information.

ANERLEY. — For the erection of stabling, letter-sorters' room, and cottage in the Ridsdale-road, Anerley, S.E., for Mr. Walter Smith, of the Co-operative Stores, Anerley. Mr. C. J. C. Pawley, architect, 26, Moorgate-street, E.C.:—

Spicer, J., Anerley	£1,475 0 0
Smith and Son, J., L. Norwood	1,215 0 0
Maslus, G., Anerley	1,205 0 0
Holledge and Smart, L. Norwood	1,110 0 0
North and Appleton, New Wandsworth (accepted)	1,095 0 0
Ochenden, H., Anerley	931 0 0

AYR.—For upholstery work, &c., in the new town-hall, for the Ayr town council:—

Wilson, of Ayr (accepted)	£237 3 5

BALHAM.—For additions to No. 4, Archer-terrace, for Mr. J. A. Southon. Mr. J. Randall Vining, 48, Guildford-street, Russell-square, architect:—

Rumens, W.	£424 0 0
Marriage, W.	410 0 0
Potterton, T. (accepted)	396 0 0

BARTON.—For the construction of a 2ft. pipe outfall sewer, sluice chamber, principal bench carriers, &c., for the Warley main drainage on the Barton Old Hall Sewage Farm. Mr. John Price, A.M.I.C.E., engineer. Quantities supplied by the engineer:—

Snape, W. and Sons, Eccles	£201 13 8
Williams, J., Chester	163 19 0
Turner, R. and Sons, Warrington*	137 0 2

* Accepted.
(Engineer's estimate, £140.)

BISHOP AUCKLAND.—For the erection of a young men's Church institute. Mr. Robert W. Thompson, architect, 46, North Bondgate, Bishop Auckland. Accepted tenders:—

Mason's work:—	
Bell, G. H., Bishop Auckland	£655 0 0
Joiner's work:—	
Braithwaite & Son, B'hop Aucklnd.	368 0 0
Plasterer's work:—	
Kirby, S., Bishop Auckland	90 0 0
Slater's work:—	
Pollard, W., Bishop Auckland	57 0 0
Painter's work:—	
Thompson, R., Bishop Auckland	45 0 0
Plumber's work:—	
Laidler, J., Durham	179 0 0
	£1,394 0 0

BOURNEMOUTH.—For the erection of a mortuary at the cemetery:—

Manuel	£195 5 0
Jeans	171 0 0
George	152 0 0
Jenkins and Son	147 0 0

BURNHAM, SOMERSET.—For scavenging the town, for the local board:—

Sperring, J. (accepted)	£260 0 0

[Eleven tenders received.]

BURTON-ON-TRENT.—For erection of bark shed, &c., stores, chimney, &c., Burton-on-Trent. Messrs. William Sugden and Son, architects, Leek. Quantities by architects:—

Sugden (no relation of architects) / Chamberlain, Bros. / Pickering, Bros. / Buxton and Thorney	£2,344 17 0

CHISWICK.—For the construction of four additional tanks at the sewage pumping station, for the Chiswick improvement commissioners. Mr. H. O. Smith, engineer and surveyor:—

	In brickwork.	In concrete and brickwork.
Acook, G	£3,977	£4,122
Dickenson	3,889	3,991
Keeble, T. W.	3,574	3,688
Nowell and Robson	3,442	3,591
Neave, W. and Son	3,285	3,370
Smith, H.*	2,520	2,860

(* Recommended for acceptance.)

DOCKHEAD.—For additions to St. Saviour's Wharf, Dockhead, for Seth Taylor, Esq. Messrs. Snook and Stock, architects:—

Rider	£4,035 0 0
Wells	3,984 0 0
Marsland	3,912 0 0
Greenwood, J. and J.	3,697 0 0
Holland and Hannen	3,573 0 0

DRUMCONDRA.—For the substitution of steps for a retaining wall on eastern side of Hollybank, Drumcondra, for the town commissioners. Mr. Leonard, C.E., township surveyor:—

Derwan and Boylan (accepted)	£50 0 0

DORCHESTER.—Tenders received by town council for a cottage to be erected at the waterworks. Plans prepared and quantities supplied by Mr. Walter Thomas, Assoc. M.I.C.E., borough engineer and surveyor:—

Wellspring, J., Dorchester	£299 0 0
Guy and Son, Dorchester	291 10 0
Ball and Son, Southampton	290 0 3
Tilley, L., Dorchester	275 0 0

HIGHGATE.—For additional nurses' apartments at the Holborn Union Infirmary, Highgate. Messrs. H. Saxon Snell and Son, architects:—

Howard	£2,350 0 0
Bamford	2,275 0 0
Mowlem and Co.	2,246 0 0
Wall, Bros.	2,190 0 0
Crockett (accepted)	2,059 0 0
Garrud	1,937 0 0

HOLLOWAY.—For new meeting-room, additions, &c., at St. Barnabas Church, Harriet-road, Holloway. Mr. T. K. Green, architect:—

Niblett, W. T. (accepted).

HOVE.—For scavenging the district for one year, for the Hove town improvement commissioners:—

Hudson (accepted)	£100 0 0

[Lowest tender but one of those sent in.]

KILBURN, N.W.—For the enlargement of a school now in course of erection in Netherwood-street, Kilburn, from 600 to 1,000 school places, for the London School Board, Mr. E. R. Bobson, F.S.A., architect to the Board:—

Kirk and Randall (accepted)	£2,847 0 0

Messrs. Kirk and Randall's tender was accepted at £6,462 for the original school, and the present tender is based on contract schedule of prices:—Cost of site (area 32,795 sq. ft), £2,587 6s. 9d; cost of (*a*) school buildings, including larger closets, £2,594; (*b*), tar pavement and playground, £124; (*c*), boundary walls and gates, £129; total, £2,847. Cost per head of (*a*), (*b*), and (*c*), £7 2s. 4d.

KIRKINTILLOCH.—For the erection of street urinals, for the police commissioners of Kirkintilloch:—

Smith, G. and Co., Glasgow (accepted).
[Lowest of four tenders received.]

LEICESTER.—For the erection of two lodges and entrance gates at the Abbey-road approach to Abbey Park, for the Leicester town-council. Mr. Tait, architect:—

	Lodges.	Gates.
Kellett, W. H. (accepted)	£1,113	£303 10 0

LEEK.—For additions and alterations to the West-street Sunday and day-school premises, Leek. Messrs. William Sugden and Son, architects. Quantities by the architects:—

Bromage / Stevenson	£1,275 0 0

LEEK.—For alterations and extensions to St. Edward's Schools, Mill-street, Leek. Messrs. William Sugden and Son, architects, Leek. Quantities by the architects:—

Knowles / Mackerell / Phillips	£1,203 1 0

LISKEARD.—For the erection of schools in Barley-lane for the Liskeard School Board. Messrs. Webb and Pearce, architects to the Board:—

Gill, Liskeard	£2,195 10 0
Godfrey, Liskeard	2,190 0 0
Trehane, Liskeard	2,050 0 0
Pooley and Sierley, Liskeard	2,035 0 0
Nicholls and Sons, Liskeard	1,975 0 0
Northcott and Sons, Pensilva*	1,756 0 0

*Accepted.
(Architect's estimate, £1,825.)

LONDON.—For proposed dwellings, for the Broad-street Station Dwellings and Workshops Co. (Limited). Mr. E. T. Hall, A.R.I.B.A., architect:—

Patrick	£35,312 0 0
Longmire and Burge	34,300 0 0
Adamson	33,700 0 0
Bray	33,350 0 0
Greenwood, J. and J. (accepted)	32,800 0 0

LONDON.—For street-cleaning and dust removal during three years, for the vestry of St. James, Westminster:—

Bryce (accepted) £3,700 per annum.
[Present contract, £4,700 per annum.]

LONDON.—For foundations in Gray's Inn-road, Holborn, for Mr. Ryall. Mr. George Vickery, architect:—

Jerrard	£1,636 0 0
Patrick	1,625 0 0
Morter	1,543 0 0
Colls and Sons	1,542 0 0
Lawrence	1,485 0 0
Ashby Bros.	1,455 0 0
Brass	1,438 0 0
Nightingale	1,430 0 0
Crabb, Geo.	1,392 0 0

LONDON.—For first portion of new premises in Upper Whitecross-street, E.C., for Messrs. Hodgkinson, Stead, and Co. Mr. John Collier, architect:—

Crabb, Geo. (accepted)

LOWESTOFT.—For making-up St. George's-road, for the improvement commissioners:—

Church, J.	£367 15 9
Tandy, Thos.,	363 15 0
Yallop, Jas. (accepted)	347 3 6

LOWESTOFT.—For the construction of intercepting sewers, for the Lowestoft Improvement Commissioners:—

Botterill, J., London	£13,753 0 0
Bell, J., Wood Green, W.	12,369 0 0
Rigby, Worksop	10,952 0 0
Pearson and Son, Ipswich	10,000 0 0
Neave, J., and Son, Lewisham	9,458 9 6
Etheridge and Fay, Manchester	9,000 0 0
Cook and Bennett, Spalding*	8,186 0 0

*Accepted
(Surveyor's estimate, £8,243.)

MELTON MOWBRAY.—For a sewer in Nottingham-road, for the local board. Mr. Johnson, surveyor:—

Bishop	£75 0 0
Shurman	58 15 0
Barnes	47 19 0
Glover	46 0 0
Shaw, E. (accepted)	42 10 0

MANSFIELD.—For a detached house on the Crow Hill Estate, for T. Buxton, Esq. Mr. Thomas Hartas, architect, 26, King-street, Manchester; quantities by J. H. Stone, Todd-street, Manchester:—

Vallance and Son	£1,370 0 0
Greenwood	1,300 0 0
Parsons and Stevenson	1,229 8 6
Sills	1,215 0 0
Parsons C.	1,210 0 0
Hind	1,207 0 0
Vallance W. A.	1,178 0 0
Alsop	1,163 9 9
Fisher (accepted)	1,110 0 0
Young	1,095 0 0

MARKET HARBOROUGH.—For new mill at Market Harborough. Mr. W. Talbot Brown, architect, The Square, Wellingborough:—

	A.	B.
Major, Leicester ...	£3,557 0 0	£3,500 0 0
Parnell and Son, Rugby ...	3,550 0 0	3,490 0 0
Roberts, Bros., Stamford ...	3,450 0 0	3,380 0 0
Henson, Geo., Kettering ...	3,450 0 0	3,330 0 0
Martin, Northampton ...	3,400 0 0	3,300 0 0
Smith, B. N., Birmingham ...	3,345 0 0	3,285 0 0
Herbert, J. and H., Leicester	3,315 0 0	3,246 0 0
Watkin, Northampton ...	3,100 0 0	2,950 0 0
Smith, Bros., Northampton	3,030 0 0	3,030 0 0
Henson, Wellingborough ...	*2,973 0 0	2,973 0 0

* Accepted for A.

A with Dumfries stone dressings; B with Ketton stone dressings.

NEWPORT, I. W. — For restoration of the National Schools, Newport, I. W. Mr. R. Braxton Perress, architect:—

Grant, Newport	£796 0 0
Dyer, Newport	760 0 0
Jenkins, Bros. (accepted)	649 0 0

NORWICH.—For the erection of four cottages at the new city asylum, for the town council:—

Hurn, J., of Hellesdon (accepted)	£569 0 0

(Lowest of four tenders received.)

NOTTING-HILL.—For furnishing the new workhouse infirmary in Rackham-street, Ladbroke-grove-road, for the Marylebone board of guardians. Messrs. H. Saxon Snell and Son, architects:—

Melus and Co. (accepted).

PORTSMOUTH.—For the extension of Portsmouth and Cosham tramways for the Provincial Tramways Company (Limited). Messrs. Davis and Emanuel, engineers, 2, Finsbury-circus, E.C. Quantities by Mr. John Glenn:—

Nowell and Robson, Belgrave-road, London	£7,747 0 0
Quick, T. W., Portsmouth... ...	7,670 0 0
Bramble Bros., Portsea	7,515 0 0
Light, W. R. and C., Portsmouth	7,447 0 0
Griffiths, Kingsland-road, London	7,125 0 0
Cooper, T. C., Portsmouth... ...	6,941 0 0
Bevis, F., Portsmouth	6,747 4 7
Ward, W., Portsmouth	6,672 0 0
Hill, W., Gosport	6,600 0 0
Shepard, J., Chetwynd-road, Highgate, London, N.... ...	5,542 0 0
Hayter, T. B., Portsmouth ...	5,490 0 0
Leather, C., Portsmouth	4,840 0 0

RIPPONDEN.— For the erection of twelve dwelling-houses, in the Lower-road, for the Oddfellows' Club. Mr. W. H. D. Horsfall, of Halifax, architect. Accepted tenders:—

Masonry: Stott and Wadsworth, Ripponden.
Joinery: Whiteley, C. and W., Rishworth.
Plastering: Whiteley, J., Sowerby Bridge.
Plumbing: Stafford, Sowerby Bridge.

SALISBURY.—For re-seating the south aisle of St. Thomas's Church, Salisbury:—

Gregory, T., Clapham	£373 0 0
Foley, A., Salisbury	326 6 0
Curtis, H. A., Salisbury	325 0 0
Oborne, J., Shaftesbury	252 10 6
Young and Sons, Salisbury	225 0 0
Wort, J., Salisbury (accepted) ...	222 12 6

SANDY, BEDS.—For the erection of a fire-engineer's house:—

Haynes, George	£172 0 0
Bonfield	166 15 0
Haynes, John, Sandy (accepted) ...	166 0 0

ST. GEORGE'S-SUPER-ELY.—For the erection of a board school and teachers' residence at St. George's-Super-Ely, Glamorgan. Messrs. Blessley and Vaughan, architects, 22, Trinity-street, Cardiff. Quantities by the architects:—

Shepton, Cardiff	£1,509 0 0
Howell and Son, Bristol	1,399 0 0
Jones, Bros., Cardiff	1,330 0 0
Denne, Cardiff	1,328 7 6
Gough, Cardiff	1,311 0 0
Veal, Bristol	1,254 0 0
James and Son, Bridgend... ...	1,164 0 0
Thomas, Cardiff	1,150 0 0
Thomas, Llantrissant	738 0 0
Williams and Miller, Dynes ...	689 10 0

RUSHDEN.—For coffee tavern and public hall, Rushden, Higham Ferrers, Northamptonshire. Mr. Abraham Hart, architect, of Wakefield. Quantities by the architect:—Tenders for Hall and Stabling:—

	Mason, Tiler, and Plasterer.	Carpenter.	Plumber.	Total.	Total for Both.
Ball and Bailey, ...	£698 10 0	£570 14 6	£202 10 0	£1,471 14 6	£2,630 2 0
Fisher, Bros., Northampton ...	...	...	...	1,903 0 0	2,516 0 0
Henson, Geo., Wellingborough ...	600 9 7	485 19 5	152 7 9	1,238 16 9	2,073 1 10
Ireson, D., Northampton ...	587 0 0	405 0 0	145 0 0	1,147 0 0	1,916 0 0
Bayes, J., Rushden ...	631 0 0	...	...	...	...
Marriott, R., Wellingborough ...	601 0 0	...	...	...	...
Young, I., Wakefield ...	*442 0 0	...	...	...	...
Pycock and Son, Leeds ...	†220 0 0	...	...	...	...
Driver, Chas., Wakefield ...	†103 6 0	...	...	...	...
Miller, Chas., Northampton ...	492 10 0	...	...	...	...
Foskett, W., Rushden ...	...	479 0 0	...	...	...
Hudson and Stevens, Wellingborough	...	441 9 0	...	...	...
Briggs, Thos., Kettering...	...	430 0 0	...	...	...
Coates, W., Thrapstone ...	...	340 0 0	...	...	...
Moore, W., Rushden ...	...	357 0 0	...	...	...
Key, H. K., Wellingborough	...	...	171 0 0	...	...
Margetts, J., Rushden ...	...	...	153 10 0	...	...
Woodward, W., Rushden ...	...	...	149 10 0	...	...
‖ Spencer, W., Rushden ...	...	...	121 0 0	...	...

* Mason only. † Tiler only, including hall. ‡ Plasterer only. § Including hall. ‖ Accepted, subject to reduction of total cost to £1,639.

STOWMARKET, SUFFOLK.—For improvements to the parish churchyard, including levelling the surface for the burial board:—

Andrews and Son, Stowmarket (accepted).

SUTTON COLDFIELD.—For the enlargement of Boldmere schools, for the corporation of Sutton Coldfield:—

Simons, Birmingham (accepted) ... £430 0 0

THORNBURY.—For the erection of new labour-wards at the workhouse, for the board of guardians. Mr. J. Y. Sturge, of Thornbury, architect:—

Roach, of Charfield (accepted) £679 0 0

(Lowest tender but one received. Highest, Charles, of Bristol, £1,094; lowest, Cary, Fishponds, Bristol, £571.)

TUNBRIDGE WELLS.—For additions to the Swan Hotel, for Mrs. Semark. Messrs. Cross and Wells, architects, Hastings:—

Strange and Sons (accepted) ... £2,031 0 0

STAPLETON, NEAR BRISTOL.—For the construction of 7,300 yards of brick sewers, and 13,300 yards of stoneware pipe sewers, with manholes, flushing-valves, lampholes, &c. Quantities supplied by the engineer, Mr. James P. Curtis:—

Wilkins and Son, Bristol ...	£26,800 0 0
Raynor, G. Bootle, Liverpool ...	25,550 0 0
Deacon, Chas., London	23,000 0 0
Kerby and Hickery, Bristol ...	23,168 0 0
Mackay, J., Hereford	23,400 0 0
Thomas and Son, Newport ...	23,000 0 0
Howell, E. C., Bristol	21,500 0 0
McKensie, London	20,500 0 0
Stevenson, Geo., Chesterfield ...	19,456 0 0
Mereaweather, Wm., Bristol ...	18,600 0 0
Durnford and Sons, Totterdown	18,500 0 0
Monks E., ...	18,103 0 0
Case and Day, Fishponds ...	17,723 11 0
Bevan A. J., Bedminster, Bristol	16,950 0 0
Currall and Lewis, Birmingham	16,326 0 0
Keneday, Westbury	14,835 0 0
Dawson, J., Bury	14,650 0 0
Neave, J., London	14,648 0 0
Meredith J., Gloucester	14,470 0 0
Yalland, Thos. K., Fishponds*...	13,929 0 0

* Accepted.

TWICKENHAM.—For the erection of Thames View House, St. Margaret's-road, for Mrs. Foster. Mr. W. Seckham-Wetherington, F.R.I.B.A., architect, 79, Mark-lane, E.C.:—

Lucas, Richmond	£2,787 13 6
Russell, Hackney	2,297 0 0
Taylor and Parfitt, Haggerstone...	2,079 0 0
Correy, Liverpool-road, N. ...	1,845 0 0

(Architect's estimate, £1,850.)

WEELEY, ESSEX.—For the erection of a house and shop at Weeley, for Mr. Jehu King. Mr. Page, Hythe-hill, Colchester, architect:—

Canham, Weeley	£270 0 0
Eade, Mrs., Lexden	213 0 0
Clarke, Great Bentley	187 10 0
Beard, Chappel (accepted)	175 0 0

WESTMINSTER.—For new premises, No. 122, 123, and 124, Pall Mall, London, for the Life Association of Scotland. Mr. Alexander Peebles, F.R.I.B.A., architect:—

	Contract No. 1.	Alternative materials. Extra.	New Vaults. Extra.	Sub-basement. Extra.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Fish, C.	22,302 0 0	... 611 0 0	... 560 0 0	... 2,080 0 0
Clarke and Bracey ...	21,540 0 0	... 665 0 0	... 463 0 0	... 1,590 0 0
Trollope and Sons ...	21,538 0 0	... 671 0 0	... 477 0 0	... 1,995 0 0
Perry and Co. ...	21,486 0 0	... 761 0 0	... 387 0 0	... 1,889 0 0
Colls and Sons ...	20,921 0 0	... 628 0 0	... 668 0 0	... 2,036 0 0
Conder, E.	20,475 0 0	... 632 0 0	... 595 0 0	... 1,950 0 0
Ashby, Bros.	20,180 0 0	... 635 0 0	... 518 0 0	... 1,450 0 0
Holland and Hannen	20,106 0 0	... 636 0 0	... 506 0 0	... 1,420 0 0
Bruce, W.	19,920 0 0	... 612 0 0	... 534 0 0	... 1,892 0 0
Ashby and Horner ...	19,840 0 0	... 610 0 0	... 510 0 0	... 1,690 0 0
Lawrence, E... ...	19,576 0 0	... 578 0 0	... 496 0 0	... 1,240 0 0
Morter, J.	19,313 0 0	... 593 0 0	... 511 0 0	... 1,547 0 0

[The tender of Mr. Morter accepted without the sub-basement.]

WIMBLEDON.— For making-up Graham-road for the local board:—

Eyles (accepted) £750 0 0

BEST BATH STONE.

Westwood Ground, Box Ground, Combe Down, Corsham Down, and Farleigh Down.

RANDELL, SAUNDERS, & CO., LIMITED,
CORSHAM, WILTS.

FLETCHER'S PATENT
METAL SUBSTITUTE FOR PUTTY,
FOR GLAZING PURPOSES ONLY.

Roofs covered in with 21oz. Sheet or Rolled Glass at from 9d. per foot Super., including Bars.

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FLETCHER, LOWNDES, & Co., Ltd., 13a, Great George St., Westminster.

CONTRACTS.

TO BUILDERS and CONTRACTORS,

The Managers of the Metropolitan Asylum District hereby give notice that they are prepared to receive TENDERS from persons willing to Contract for the ERECTION of TWO INFIRMARIES for Imbeciles, to be built at the Darenth Asylum, near Dartford, Kent, pursuant to plans, specifications, and draft contract, to be seen on and after Thursday, the 24th March instant, at the office of the Architects, Messrs. A. and C Harston, No. 15, Leadenhall-street, E.C., between the hours of 10 and 6, where forms of Tender (on which only proposals will be received), and all other necessary information may be obtained.

Bills of quantities may also be obtained at the offices of the said architects on payment of a deposit of £3 3s., which will be returned on the receipt of a bona fide tender for the works.

Sealed Tenders must be delivered at the offices of the said Managers, No. 37, Norfolk-street, Strand, W.C., by or before four o'clock on WEDNESDAY, the 13th April next.

The Managers do not bind themselves to accept the lowest or any Tender.

By order,
W. F. JEBB, Clerk to the Managers.
37, Norfolk-street, Strand, W.C., March 12, 1881.

MIDLAND RAILWAY.
(Southern Division).
TO BUILDERS AND OTHERS.

The Directors are prepared to receive TENDERS for GRAIN SHED, Soar-lane, Leicester.

Parties desirous of Tendering for these works may inspect the Drawings, Specification, and Quantities upon application at Clerk of Works' Office, Leicester Station, on and after the 24th inst.

Tenders to be forwarded to the Secretary of the Way and Works Committee, Midland Railway, Derby, not later than 9 a.m. on TUESDAY, April 5th.

The Directors do not bind themselves to accept the lowest or any tender, nor to pay any expense connected with any of same.
JAMES WILLIAMS, Secretary.

Derby, March 15th, 1881.

MIDLAND RAILWAY.
(Southern Division).
TO BUILDERS AND OTHERS.

The Directors are prepared to receive TENDERS for the ERECTION of an ENGINE SHED and other Buildings at Child's Hill.

Parties desirous of Tendering for these Works may inspect the Drawings, Specification, and Quantities upon application at Clerk of Works' Office, St. Pancras, on and after 24th inst.

Tenders to be forwarded to the Secretary of the Way and Works Committee, Midland Railway, Derby, not later than 9 a.m. on TUESDAY, April 5th, 1881.

The Directors do not bind themselves to accept the lowest or any Tender, nor to pay any expense connected with any of same
JAMES WILLIAMS, Secretary,

Derby, March 15th, 1881.

TO BUILDERS.

TENDERS are required for the ERECTION of a VILLA RESIDENCE at Norwood.

The Plans and Specification may be seen at any time at the Office of the Architect, Mr. Thomas Elworthy, of St. Leonards-on-sea, from whom quantities may be obtained on application.

Tenders, sealed and endorsed "Tender for Villa," must be addressed and sent to

R. W. W.,
Rock House, Cintra Park,
Upper Norwood,

on or before ten o'clock in the morning of MONDAY, April 11, 1881.

The owner will not bind himself to accept the lowest or any Tender.

Also

TO CONTRACTORS.

TENDERS are required for NEW ROAD and DRAINAGE at the same place.

Quantities may be obtained on application to Mr. Thomas Elworthy as above, where Plans and Specifications may be seen.

The Tenders, to be endorsed "Tender for Road and Drainage," must be addressed and sent to R. W. W., as above, at the same time.

The owner will not bind himself to accept the lowest or any Tender.

CROYDON UNION,

The Guardians invite TENDERS for the ERECTION of an INFIRMARY for the present accommodation of about 400 patients at Mayday-road, Croydon (near the Thornton-heath, Railway Station), in accordance with plans, specifications, conditions, and form of contract prepared by Messrs. Berney and Monday, Architects, Croydon.

Builders desirous of tendering should send in their names to the Architects on or before the 28th inst., and those who shall have intimated their intention to tender may obtain the bills of quantities of Messrs. Franklin and Andrews, at 25, Ludgate Hill, London, on and after the 2nd April, on payment to them of £5 5s. as a deposit, which sum will be returned after the receipt of a bona fide Tender.

The drawings may be seen at the offices of the Quantity Surveyors on and after the 25th inst, and up to and including the 6th April, after which date they may be seen at the offices of the Architects, at Croydon.

Sealed Tenders (on forms issued with the bills of quantities), stating the names and addresses of two proposed sureties for the due performance of the contract, must be sent to me on or before the 11th day of APRIL next.

The Guardians do not pledge themselves to accept the lowest or any Tender.

By order,
ADFRED G. BLAKE, Clerk to the Guardians.
15, George-street, Croydon,
16th March, 1881.

TO BUILDERS.

TENDERS are invited for the ERECTION of eight COTTAGES at Selhurst.

Plans and specifications may be had on payment of one guinea, which will be returned if Tender is not accepted.

No pledge is given to accept the lowest or any Tender.
E. O. PICKERING, architect.

153, Church-road, Islington, N.

TO BUILDERS.

Builders desirous of TENDERING for the ERECTION of the NEW ST. PAUL'S SCHOOL at West Kensington, for the Governors of Saint Paul's Schools, are requested to send in their names and addresses to Mr. A. WATERHOUSE, A.R.A., Architect, 20, New Cavendish-street, London, W.

Tenders to be delivered on the 11th of APRIL, 1881.

FOREIGN CATTLE MARKET,
DEPTFORD.

CONTRACT for SHED for LAIRAGE ACCOMMODATION.

The Cattle Markets Sub-Committee of the Corporation of London will MEET at Guildhall on TUESDAY, the 29th day of March, 1881, at two o'clock in the afternoon precisely, to receive PROPOSALS for the CONSTRUCTION of a SHED for Lairage Accommodation at the Foreign Cattle Market, Deptford.

The drawings, specification, and form of contract may be seen at the Architect's office, Guildhall, between twelve and three (Saturdays twelve and two), and copies of the bills of quantities will be furnished on payment of two guineas, to be returned to persons sending in Tenders.

Tenders must be delivered by hand at the Hallkeeper's Office, Guildhall, on Tuesday, 29th March, 1881, between the hours of one and two o'clock, and persons Tendering must attend the Committee at two o'clock precisely.

The Sub-Committee do not bind themselves to accept the lowest or any Tender. MONCKTON.

Guildhall, E.C., March 17, 1881.

PRISON COMMISSIONERS,
SCOTLAND.

CONTRACT for WARDERS' and CHIEF OFFICERS' QUARTERS at the NEW PRISON, GLASGOW.

The Prison Commissioners of Scotland will receive TENDERS for the ERECTION of WARDERS' and CHIEF OFFICERS' QUARTERS, at the New Prison, Barlinnie, near Glasgow.

The plans, specifications, and quantities of these Buildings may be seen at the Office of the Commissioners in Edinburgh.

The Commissioners do not bind themselves to accept the lowest or any Tender.

Tenders are to be sent to this Office on or before the 26th April next, addressed under cover to the Secretary, and endorsed "Tender for Warders' and Chief Officers' Quarters at the New Prison, near Glasgow."

130, George-street, Edinburgh, March 22, 1881.

PRISON COMMISSIONERS,
SCOTLAND.

CONTRACTS FOR NEW PRISON, GLASGOW.

The Prison Commissioners of Scotland will receive TENDERS for the ERECTION of the Second Block of a NEW PRISON to be built at Barlinnie, near Glasgow, containing 200 Cells.

The Plans, Specifications, and Quantities of this block may be seen at the Office of the Commissioners in Edinburgh.

The Commissioners do not bind themselves to accept the lowest or any Tender.

Tenders are to be sent to this Office on or before the 26th of April next, addressed under cover to the Secretary, and endorsed "Tender for the Second Block of New Prison, near Glasgow."

130, George-street, Edinburgh, March 22, 1881.

METROPOLIS LOCAL MANAGEMENT ACTS.
BOARD OF WORKS FOR THE PLUMSTEAD DISTRICT.
TO STONE MERCHANTS, PAVIORS, AND OTHERS.

The Board of Works for the Plumstead District are prepared to receive TENDERS for NEW PAVING or KERBING, CHANNELLING, ROAD-MAKING, and other Works in certain new streets called Brewery-road, Upper Robert-street, Upper Earlstreet Upper Elm Grove-street, Upper Station-road, Durham-road, Park-road West, Upper Park-terrace, and Francis-street, in the Parish of Plumstead, within the said Plumstead District, in the County of Kent.

The plans and specifications for these Works can be seen, and printed forms of Tender and all other particulars may be obtained at the Parochial Offices, Maxey-road, Plumstead.

A separate price is to be stated in each Tender for the Paving Works in each of the above roads respectively, and such Tender is to be delivered at the Offices of the Plumstead District Board of Works in Old Charlton Village at or before four o'clock in the afternoon of WEDNESDAY, the 13th April proximo.

The lowest or any Tender will not be necessarily accepted.
By order, GEORGE WHALE
Clerk to the said Board.

Plumstead District Board of Works, Offices, Old Charlton,
March, 1881.

COMPETITIONS.

TO ARCHITECTS.

DESIGNS are invited by the Feoffees of the Oldswinford Hospital, Stourbridge, for an EXTENSION of SCHOOL ACCOMMODATION.

The Feoffees offer a Premium of £20 for the design which they shall most approve, which design shall become their property.

The Feoffees do not bind themselves to carry out any of the Designs sent in.

The Extension must be designed in exactly the same style as that of the existing Building.

Particulars of the requirements may be obtained by application to the Visiting Committee, Oldswinford Hospital, by letter or personally, on any Tuesday at 12 30 p.m.

The plans and elevations must be delivered at the Hospital on or before the 1st of JUNE next.

G. S. MATHEWS, Steward.

March 22nd, 1881.

EASTERN COUNTIES ASYLUM
FOR IDIOTS,
COLCHESTER.
TO ARCHITECTS.

Plans and approximate Estimates are required for enlarging the above Asylum for not less than Fifty additional cases.—Particulars may be obtained upon application, plans to be sent to me not later than 29th April.

JOHN J. C. TURNER, Secretary.

SCIENCE AND ART DEPARTMENT of the COMMITTEE OF COUNCIL ON EDUCATION, South Kensington.

EXAMINATIONS IN SECOND GRADE DRAWINGS, 1881.

May 5, THURSDAY—7 to 8 p.m., Model Drawing.
" " 8.15 to 9.45 p.m., Freehand Drawing.
May 6, FRIDAY—7 to 8 p.m., Practical Geometry.
" " 8.15 to 9.45 p.m., Perspective.

A fee not exceeding 2s. 6d. per evening may be charged by Local Committees to candidates for examination, who do not belong to a school or class connected with the Department.

Individual candidates who do not reside near any place where a local examination is held, may be examined at the South Kensington Museum on payment of a fee of 2s. 6d. for each evening of examination, if application be made on form No. 325, before April 15, and 5s. afterwards up to May 1st; but no application can be received after May 1st.

By order of the Committee of Council on Education.

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Share Capital at present paid up and Invested	£1,000,000
Total Funds upwards of	£2,981,000
Total Annual Income nearly	500,000

N.B.—Fire Policies which expire at Lady-Day should be renewed at the Head Office, or with the agents, on or before the 9th day of April.

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SALES BY AUCTION.

Gutter-lane, Cheapside, in the best part of, and opposite to Carey-lane.—A valuable Freehold Property, occupying a considerable ground area, and offering a most favourable opportunity for utilisation in its present state, or for a profitable building scheme.

MESSRS. WINSTANLEY and HORWOOD are instructed to offer for SALE by AUCTION, at the Mart, Tokenhouse yard, on TUESDAY, the 29th March, at 1 for 2 o'clock, a very valuable and highly important FREEHOLD PROPERTY, known as Nos. 21 and 22, Gutter-lane, and No. 6, Huggin-lane, Cheapside, occupying a most eligible position immediately opposite to Carey-lane. The present buildings consist of a warehouse, corner shop and premises, and floors over, having a frontage to Gutter-lane of about 34ft., and a return frontage to Huggin-lane of 43ft. on the ground floor, and occupying a ground area of about 1,100ft. May be viewed.—Printed particulars may be obtained of Messrs. Evans, Foster, and Rutter, Solicitors, 2, Gray's-inn-square, W.C.; of Messrs. B. W. and V. Fowys, Solicitors, 1, Lincoln's-inn fields, W.C.; at the place of sale; and of the Auctioneers, 10, Paternoster-row, St. Paul's, E.C.

Wednesday next.—South Croydon.—46 Plots of Valuable Freehold Building Land.

MR. W. A. BLAKEMORE will SELL by AUCTION, at the Greyhound Hotel, Croydon, on WEDNESDAY next, March 30, at 5 for 6 o'clock, 46 PLOTS of valuable FREEHOLD BUILDING LAND, having frontages of about 900ft. to the main Brighton Road, Sanderstead, and Purley-roads, ripe for immediate development; free conveyances granted, and payments extended over five years. Also the Detached Residence known as "Purley Lawns," with Stabling, Greenhouse, &c.—Particulars, with plans, may be had of Messrs. Gatliff and Rowse, Solicitors, 8, Finsbury Circus, E.C.; of S. Burbridge, Esq., Surveyor, 5, Eldon-street, Finsbury, E.C.; at the place of sale, and of the Auctioneers, 24, Salisbury-street, Strand, W.C.

Timber.—Hampshire, in the neighbourhood of Basingstoke, Oakley, Overton, Micheldever, Alresford, Stockbridge, Deane (for Wallop), Aldermaston and Midgham (for Kingsclere), the whole within easy distance of the above stations on the London and South Western and Great Western Railways, and near good roads, for Sale by Auction by

MESSRS. RAYNBIRD and SONS, at their Auction Mart, Basingstoke, on WEDNESDAY, the 30th of March, 1881, at 4 o'clock, p.m., prompt, upwards of 2,100 EXCELLENT TIMBER TREES, comprising 1,293 oak, 460 ash, 183 beech, 15 poplar, 7 sycamore, 2 large elms, 2 plane trees, 140 larch and other fir trees, and upwards of 550 fir poles and flitterns.

The lots comprise some superior oak and excellent felled and standing beech; the ash also will be found very suitable for implement makers and wheelwrights, and the larch and other fir well adapted for fences and telegraph posts, scaffold and ladder poles, &c.

The above are well deserving the attention of merchants and contractors, the trees being sound and clean, and many of them of large size

For sale catalogues apply to Messrs. RAYNBIRD and SONS land agents, surveyors, and auctioneers, at the above address.

West Croydon, Surrey.—Eligible Freehold Building Land.

MR. W. H. COLLIER is instructed by the British Land Company (Limited), to offer by AUCTION, at the White Horse, Selhurst-road, West Croydon, on THURSDAY, March 31, at 6 for 7, in lots, the REMAINING PORTION of eligible FREEHOLD BUILDING LAND, free from tithe and land-tax, with excellent frontages to the Selhurst and Sydenham-roads and Arundel and Westbury-roads leading therefrom, situate close to the Selhurst Station, and within ten minutes' walk of West Croydon Station on the London, Brighton, and South Coast Railway. The purchase-money may be paid by a deposit of 10 per cent, and the balance can remain on mortgage or contract at 5 per cent. interest, to be paid in nine years by equal half-yearly instalments; but the whole or any part of the balance may be paid off at any time without notice. Free conveyance will be given on the vendor's title being accepted.—Particulars, plans, and conditions of sale may be obtained at the principal inns in the neighbourhood; of Messrs. R. and A. Russell, Solicitors, 39, Coleman-street, London, E.C.; of Mr. Lee, Auctioneer, at the offices of the British Land Company (Limited), 25, Moorgate-street, London, E.C.; and at the place of sale.

First Portion.—Valuable Freehold Building Land at Finchley.

MESSRS. E. E. CROUCHER and Co. will SELL by AUCTION, at the Assembly Rooms, adjoining the Railway Hotel, Church End, Finchley, on TUESDAY, April 12, at six punctually in the evening, in 100 lots, the first portion of the valuable and improving FREEHOLD BUILDING ESTATE, known as the Elm Park Estate, situate within three minutes' walk of the Finchley Junction Station on the Great Northern Railway, and in one of the most charming suburbs of London, having frontages to Nether street and Dollis-road, admirably adapted for the erection of superior villa and other residences. Water supply guaranteed, gravel soil, well-made roads, and drainage constructed in accordance with the by-laws of the Finchley sanitary authorities. Free conveyance. Nine-tenths of the purchase-money can remain at 5 per cent per annum interest, repayable over a period of years. Note.—The mansion known as Elm Place, and a suitable plot of ground, will be offered for sale on this evening. The land may be viewed by application to the Foreman on the Estate. Plans, particulars, and conditions of sale may be obtained of Messrs. Whittington and Son, Solicitors, 3, Bishopsgate-street Without, E.C.; at the place of sale; at the principal inns and taverns in the neighbourhood; on the Estate; and at the Auctioneer's Offices, 76, Cnancery-lane, W.C., and 223, Seven Sisters-road, N.

Re Martin, McLean, and Co. (Limited), in Liquidation.—By Order of Vice-Chancellor Sir James Bacon, on TUESDAY, April 12th, 1881, at one for two o'clock precisely.

MR. BRADSHAW BROWN will SELL by PUBLIC AUCTION, at the Mart, Tokenhouse-yard, E.C., as a going concern, in one lot, the
LEASE and VALUABLE MACHINERY and PLANT, with Implements in Trade, of
THE SURREY CANAL CEMENT WORKS, New Cross, S.E.
The premises have a frontage of 108 feet to the Surrey Canal, and the buildings have been erected at a large cost. The machinery and plant are modern, and in every way suitable for the purposes of making Keen's and other cements. Unexpired term 74 years. Ground-rent, £105 per annum.

Also,
THE LEASE OF ST. HELEN'S WHARF, BANKSIDE, S.E., adjoining Southwark Bridge. The premises comprise substantial brick-built warehouse of four floors, with dwelling house in rear, and wharf to Thames. Held for 21 years from Christmas, 1879, at £350 per annum, but of the estimated rental value of £420 per annum.

The GOODWILL of the Cement Business now carried on by Messrs. Martin, McLean, and Co. (Limited), with Trade Marks, Brands, Utensils, and Office Furniture.

The Valuable PATENTS for Internal Mural Decorations in Cement, Ornamental Tiles, Slabs, and Panels.

Solicitors, Messrs. Baker and Nairne, 3, Crosby-square, E.C. Accountant, Arthur J. Hill, Esq., 1, Finsbury Circus, E.C.—Auctioneer's Offices, 16, London-street, Fenchurch-street, E.C. and Millwall, E.

FIRE at G. MITCHELL'S MARBLE GALLERIES, 166, Brompton-road, London, S.W.—In consequence of the late destructive fire, Mr. MITCHELL has a large SALVAGE STOCK thrown upon his hands, consisting of Marble Stone, and Alabaster Chimneypieces, Stoves, Fenders, Kitchen Ranges, Tombs, Crosses, Tablets, &c., which he is prepared to DISPOSE OF by PRIVATE CONTRACT immediately, at very low prices. The Royal Arms in stone, large size, slightly damaged. Also a number of Scagliola Columns, &c. Offers for any part of this late valuable Stock are respectfully solicited. Approved bills taken.—G. MITCHELL, 166, Brompton-road, London, S.W. Business carried on as usual at 148, Upper Thames-street; also at Chelsea Works.

THE BUILDING NEWS.

LONDON, FRIDAY, APRIL 1, 1881.

GROUND-RENTS AND BUILDING ESTATES.

THE creation of ground-rents in the suburbs of London and other large towns, a source of wealth to the landed proprietor, promises, unless guarded against, to become an evil of such magnitude as to lead to the gradual extinction of substantial building, to say nothing of architecture, in such parts. Well may the leasehold building system be considered an "English abomination," when we see the exorbitant ground-rents paid for strips of land upon which it is simply impossible to build decent houses with decently-sized gardens to them; when hundreds of residents in various parts of London are driven out of houses which could boast of their one to five acres of land to make room for ill-constructed tenements; and when every month young builders are ruined by being made the tools of speculators who have promised to give them a start in business, on the understanding that they cover their ground with bricks and mortar, heaps of badly-constructed tenements, and to afterwards sell them to struggling City clerks and others, who have either saved enough or can obtain about £300 to £500 from a building society. These three well-defined developments of the leasehold system, the restriction of building area, the deterioration of residential estates, and the bankruptcy of speculative builders, are evils which, at the beginning of every year, seem to grow in importance, but they all spring from the desire to buy land cheaply in large quantities, and then lease it in small lots at exorbitant rents to small builders, who desire to derive an income from their cunning by supplying the demand for a small class of houses. There is a popular notion that the speculative or "jerry" builder, as he is sometimes called, is at the bottom of this pernicious system, but it is not so; he is only one of the necessary consequences of it. The fault lies deeper, it may be traced back, indeed, to feudal restrictions, the monopoly of land, and the complex legal machinery attending title and the transfer of land. Compelled to rent land, the builder constructs his houses to last only the term of his lease; and in so acting he is only doing that which the most honourable man of business can approve. He must so apportion the ground-rent to the house-rent as to secure a profit, calculated of course in such a way that the rack-rent bears a certain proportion to the ground-rental, so as to enable him to make a fair interest on his outlay, and to lay by such an annual sum as will, with accumulated interest, amount to the value of the capital expended at the expiration of the lease. The tenant is the real sufferer; he has to pay not only the interest of the builder for his outlay, but an additional sum for insurance or a sinking fund. Let us look at the subject a little deeper. It is evident that to make a house remunerative, the ground-rent must be proportionately small; but this is daily becoming more and more impossible. In many instances the ground-rental exceeds one-fifth the rack-rental, the results of which are cramped gardens or badly-built houses. Under the present system, the speculator with large capital reaps the benefit; he takes a large quantity of land, and pays a wholesale price, the first few years being rented at a peppercorn. The land is underlet at higher rates, in fact it is retailed out to the builders, creating an "improved" ground-rent. A lot leased at, say, £100 is under-leased at a considerably increased percentage, often from 25 to 50 per cent. The £100 is charged by the lessee on houses covering perhaps only half the plot, so that he gains double by the transaction. To make his bargain remunerative it is easy to see that the temptation to the builder is to divide this plot into as many lots as he can, as the more the ground-rent is divided the better is the chance of sale or mortgage of the building; but as an owner or landlord can distrain for arrears on all the houses built upon land on which the ground-rent has been assessed equally, it is best to take the several leases separately from the freeholder direct. The interests of freeholders and builders are consequently often diametrically opposed; the one endeavouring to obtain a large return by getting his land covered, and the latter, striving to spend as little money as he can upon houses he does not care shall survive the term of his lease.

The figures realised for building-land in the suburbs of London increase year by year. Ground-rents are often as high as £8 for a strip of land not much more than 80ft. deep by 18ft. frontage. Much of the land in the south of London sells at from £1,000 to £2,000 per acre, and even at ten miles from the City, land for building purposes often lets at from £500 to £600 an acre. At such exorbitant prices, and with an increasing demand for houses of a small stamp, it is not surprising the temptation is great, and that few, even of those who inherit and enjoy semi-rural residences of the older class in many of our suburbs, can resist the inclination to part with houses standing in their own grounds. This form of the mischief is, perhaps, more serious, in its way, than the building over of some acre or two of waste or unreclaimed land; it is certainly more pitiable to see some fine old suburban house which has been inherited for two or three centuries levelled to the ground for the sake of the increased value of the few acres attached to it, so that they may be divided into small lots, and built over with a class of mean tenements. Anyone may see this wanton spoliation of the suburbs in some of our main thoroughfares three or four miles from the City; as, for example, in the Peckham-road, Brixton-rise, Tulse-hill, Streatham, in all of which parts well-built brick houses, with their own appanage of land, are being sacrificed. The results of this change are manifold. It affects the value of property in the neighbourhood; when the larger properties are sold or built over with a small class of tenements and shops, the well-to-do occupants leave or retire farther away from town, the few large houses that remain become quickly untenanted, and the locality once enjoying a residential reputation completely changes its character and becomes commercial. Of course, in many cases, the expiration of leases often leads to the change, though if there were some restriction imposed on builders, there would not be that destructive fury in demolishing an old house and dividing its acre of land into perhaps 50 plots for houses which, at £8 ground-rent, would realise the interest on £400 to freeholder. The relations between the freeholder and the builder may be better understood if we take an example of an ordinary agreement for a building lease. In proper documents the term of lease and the ground-rents are specified, according to the several frontages, at per foot lineal; a peppercorn rent of a few shillings is charged for the first year, and perhaps half the rent for the second year. The ground-rent may be apportioned among the houses built at the specified rates, or there is a proviso to the effect that one-fifth or sixth the rack-rent should be the highest limit. The lessee agrees to erect so many houses of a certain kind, the cost of which is specified, though the actual value of the materials and labour, at a certain rate, is not so clearly defined; the houses, however, are generally to be let at a certain rental. Possession of land is given to lessee on signing the agreement, and he is generally required to complete certain houses by a certain date, in default of which the freeholder can annul the contract and take possession of the ground, buildings, and materials on the ground. The other provisions include the insurance of the houses, the repair and maintenance of roads and sewers, each lessee being called on to contribute his share to these expenses according to a scale fixed by the surveyor. Other covenants are sometimes to be found relating to the materials and scantlings to be used, the surveyor's fees for approval of plans of each house, and often 1 per cent. on cost of house for his certificates; also relating to duplicate agreements, leases, and counterparts, with a variety of other legal requirements, which the lessee, often unconscious of his responsibility, agrees to perform. The lease, among other things, comprises covenants binding the lessee to paint outside every three, and inside every seven years; to rebuild or reinstate in case of destruction by fire or otherwise; to use premises for trade purposes only; not to commit waste, assign, or underlease without proper notice; and to leave premises in good repair at the expiration of lease, with a proviso for re-entry of lessor on nonpayment of rent or breach of covenant. There are few more unequal laws than those affecting the lessee, or one who holds by an underlease, as he is responsible for non-observance of covenants, even not of his own making, or is made the sufferer for the nonpayment of rent by others on the estate.

The custom of making periodical advances to the builder is one very generally prevailing in this country, and, to a certain extent, becomes an incentive to a certain class of builders to undertake this class of speculative house manufacture. The leases contain usually a provision for such advances, which are made on the surveyor's certificate during successive stages of the building. In this way the freeholder or lessor covers his land by creating rent, taking care however that the sums advanced are considerably within the value of the work executed. Often a mortgage is executed to secure repayment. The builder is tempted to embark in a speculation which he has no adequate means of carrying out, and beginning with a stock-in-trade of rough carcases, and helped by advances, he obtains large credit for materials, and often manages to cover a large estate with his miserable hovels. The system is prejudicial to the building trade in every branch; it encourages a lazy and unprincipled set of men to embark with inadequate capital, to live on the "draws" they obtain, till the wretchedly-built tenements fail to let or secure respectable tenants, and the half-finished houses are pounced upon and sold to ill-advised purchasers. The bankruptcy court is the haven of the builder, who often begins anew if not irretrievably ruined in his prospects. But the evil unhappily spreads farther; the system calls up a demand for a class of incompetent builders and workmen, who, useless at better work, or too lazy to be employed on honest workmanship, give prices for and take contracts upon erections which have no claim to the designation of "building," and who, by low prices and bad workmanship, tend to undersell the labour and skill of better men. It is time some limit was put upon the freeholder or lessor in leasing his land, and that ground-rent should be made to bear a fairer relation to the land and to the rent and class of building erected upon it.

BLACKFRIARS-BRIDGE SCULPTURE COMPETITION.

THE Committee of the Bridge House Estates have received about 50 designs in competition for the first of the groups to be erected on the four pedestals of Blackfriars Bridge, and the designs have this week been arranged for private exhibition in the Guildhall of the City of London. The subjects selected by the sculptors are some allegorical and some historical, and the materials suggested are generally stone or bronze, a few of the competitors only proposing to use marble. Taking some of the more conspicuous designs at random, without any attempt at classification, we note a vigorous group of two colossal equestrian figures representing a scene from the history of William I., for execution in bronze. The entire length of the pedestal, which is 28ft., by 12ft. 6in. in width, is occupied by the figures. These, when judged simply as sculptures, seem admirably adapted for the position intended, even if it be objected that William the Conqueror had very little to do with Blackfriars Bridge, or, for that matter, the City Corporation either. The authors of the work under notice are Messrs. Mark and W. Roche, who like Mr. Charles B. Lawes, seem to have grasped the necessity of a sharp and defined outline for any sculpture to be executed in bronze, especially as in this case when intended to be seen from a distance against the sky. The last-named artist, who, we believe, is a pupil of Foley, has however, rather too much of this quality in his fine equestrian figure of William I., to which we refer. The thorough modelling of the horse is worthy of much praise, and it at once attracts notice; but the animal, as well as its rider, seems to be going through a struggling performance, and the whole composition lacks dignity in consequence. Messrs. Farmer and Brindley have a far different series of groups, one only being worked out in detail. One and a half inches to the foot is the scale in which all the designs have had to be submitted, and all are exhibited at the same height from the floor. This group represents William the Conqueror presenting the first Charter to the City of London, and the other designs include Edward I. with Queen Eleanor, Queen Elizabeth, and Queen Victoria. The style is Gothic in character, in strict harmony with the bridge, and the architectural treatment thus adopted is an advantage in many respects. When seen from a distance, however, the grouping would, we fear, be rather confused, and in a composition depending so much on detail, the effect would be comparatively lost. This fault certainly cannot be alleged against Mr. H. R. Pinker's fine boldly-treated Cromwell (38), whose colossal cart-horse is full of vigour and spirit, like its rider. The enormous size of the pedestals seem to render some such massive treatment necessary, especially when it is remembered with what equally huge surroundings and scarcely refined backgrounds the sculptures will have to compete. Mr. Hugh Stannus has, however, by preference taken the scale of the ironwork of the bridge for the scale of his design, the subject of which is allegorical, and illustrated by a group of well-balanced figures, whose chief quality is dignified repose. The composition is decidedly original, but loses in effect from want of a more pyramidal treatment. This omission the author, in his printed description, says is intentional, because the piers are not in the centre but at the ends of the bridge. This is unquestionably true, but then the pedestals are nearly 1,300ft. apart, and so the sculptures must usually be judged by themselves as separate compositions. Notwithstanding the depressed contour of Mr. Stannus's group, his design must be numbered among the best exhibited, and he is almost the only competitor who has treated the design in such a way as to adapt it to the curved corners of the piers. Righteousness sits in the centre, seated on a throne, supported by figures representing Wisdom and Length of Days. The throne seems on the rear side to add to the objectionable height of the pedestal lines. Mr. W. Marshall's figure of Patronage, with a well-designed lion by his side, is a good work, though the subject is rather obscure. The Imperial Assemblage held at Delhi by Lord Lytton, in commemoration of the assumption by the Queen of the title of Empress of India, forms the subject chosen by Mr. James Gamble, of Old Brompton, for his clever composition. This sculptor, as a pupil of Stevens, does his master justice; but the crushing effect of the trophy, emblematic of electric light, with its Goliath figures and hanging lamps surmounting the whole, seems to place the design quite beyond the likelihood of erection. Four of such structures on Blackfriars Bridge would, indeed, produce a remarkable effect, to say nothing of their cost, which would necessarily be enormous. The total height of the composition is about 40ft. Mr. E. G. Papworth is the author of a well-conceived group in Portland stone, representing the Dawn of Civilisation in Britain, a well-known incident in the history of Boadicea being selected for the subject figures. The composition is architectural and dignified, but the parts appear rather disjointed, while the side figures, with the tea-chest-like blocks of meaningless masonry, seem too theatrical to be pleasing. No. 40 shows "Activity directing Indolence and Sloth to Progress," a design which does great credit to its author, Mr. Arthur G. Atkinson, of Kew. The figures would be over 20ft. high, but they are, for bronze, admirably free and well defined and well suited to a pier at the end of a bridge, because they seem to lead towards the structure as a centre. The figures are nude. Britannia, as might be supposed, is a favourite subject, and has been rendered in several ways, though by some in a singularly similar manner. Thus in No. 14 Mr. Fabbrucci has a car drawn by lions driven by a boy, the whole composition being good, if not original. The same idea, but less cleverly carried out, is illustrated in a group adjoining by Mr. R. Mullins, who shows Britannia on the sea in shells with sea horses, mermaids, and other creatures emblematic of the deep; but though well modelled in parts, the entire composition is lumpy in general effect. Mr. W. S. Firth, of the Lambeth School of Art, quite rises above this charge in his dashing group of Boadicea, which is rather spoilt by the recumbent figure of a man under the three prancing horses of the chariot. He is introduced to allow of the group being executed in stone as well as in bronze; but this is a mistake, for the work is decidedly in other respects best suited for a casting. The car is perhaps hardly correct from an archæological point of view, which is not a minor detail. At the other corner of the exhibition we notice a rather too elaborate, but otherwise masterly, equestrian figure of Queen Elizabeth in the full costume of her later life. The author is, we are told, Malempré, but the work seems to suggest Boehm's character of work in the horse, at any rate, and the design attracts attention. We do not like the row of five large medallions let into the face of the pier. The subjects are Shakespeare, Bacon, Drake, and others; but their insertion seems only to add to the objectionable largeness of the pedestals with their coarse carvings and cornice ornaments. This author sends three other historical sketches in clay. Mr. Michael Lawlor, who did one of the groups on the Albert Memorial, contributes a telling design of large size, representing Alfred the Great embarking to oppose the Danes. The several figures are too much separated to form a whole, and if placed thus upon a bridge pier would probably suggest an intended leap into the water below, while the purposes of the various characters are not quite clear. Near this last is Edward the Black Prince, by William Tyler, and adjoining is Mr. Thomas S. Lee's Death of Wat Tyler, which seems too hastily modelled. The author of the Death of Abel, last year's Academy prize design, ought to have worked out his model more thoroughly, for at present the merits of his composition under notice hardly compensate for its several faults. What Adam and Eve have got to do with Blackfriars Bridge is not quite clear, but Mr. T. Farrell, R.H.A., in a not very vigorous composition, has chosen this subject, illustrating the "Expulsion," with Sin and Death following in their track. Besides several other models which we have not space to mention now, are a few competitors' drawings which, according to the conditions, were eligible, provided models were made subsequently should any drawings be premiated. Of these by far the best are a series of four designs to 1½in. scale by "Dieu et Mon Droit," though the compositions shown by them are overcrowded and too involved for execution as statuary. The drawing of some of the characters is masterly and full of character, while they all show much thought and study. The subjects are historical, and include Boadicea, Richard II., Henry V., and Elizabeth in the younger years of her life. The original studies are likewise shown. A set of single colossal figures, drawn in charcoal, worthy of remark, is contributed by "Via."

All the premiated designs will become the property of the Corporation, and Sir Fredk. Leighton, P.R.A., has undertaken to assist the Committee in making their awards. The prizes are two of £250, two of £150, and two of £100. The estimated cost of the several designs is required of the authors, with a written description of their designs; the time necessary for the execution of their works being also named.

ANCIENT ART NEEDLEWORK.

THOSE who are interested in the art of needlework, and who desire to see our modern work occupying an honourable position as compared with the needlework of earlier periods, ought to pay a visit to the highly valuable exhibition of ancient English and other art needlework at the Royal School at South Kensington. The present exhibition is a development of the idea to hold an historic series of examples of ancient work, and as an instructive collection cannot fail to be highly appreciated. Our space is so limited we can merely glance at a few out of the many specimens we have seen. These have been lent by private individuals, religious houses, &c., and have been admirably arranged in chronological order by Miss L. Higgins and Miss Wade, with the aid of Mr. Alan S. Cole. One of the most precious cases contains fragments of embroidery of the 12th and 13th centuries, of what is known as the *Opus Anglicanum*, or chain-stitch. The fragments lent by the Dean and Chapter of Worcester (4 and 5) are very well preserved specimens of red silk and other woven fabrics, embroidered in gold thread, with figures of crowned and sceptered kings; these are from the coffin of Bishop de Blois (1218—1236), and from the tomb of Walter de Cantilupe. The chasuble in blue or green silk, with a branched pattern in gold thread (No. 11) with orphreys and figures; No. 12, a chasuble with orphrey containing six panels of figures workedin the *opus plumarium*, or feather-stitch, are admirable specimens of 13th and 14th-century work, rich in design and colour. A red velvet cope (18), and the blue (not black as stated)

velvet altar frontal (21), with eagles, fleurs-de-lys, and the glorified Virgin, and other emblematic figures, are good examples of early 15th-century embroidery. A boldly-designed pall of red velvet and cloth of gold, a pomegranate pattern, with purple velvet border, and groups of figures in gold thread and silk, No. 24, is a particularly well-preserved specimen, and is valuable for the costumes of the figures. It belongs to the latter part of the 15th century. Of copes belonging to this period, No. 26, red velvet and gold tissue, embroidered in the hood, with the Raising of Lazarus, and with orphreys, must be noticed as a very fine design; and the pall (27), lent by the Vintners' Company, is in very fine preservation. Coming to 16th-century specimens, many linen embroideries and hangings for various purposes are to be seen, and some very admirable copies of old work done by the ladies of the school. We particularly refer to some work with stitches of the time of Elizabeth. Nos. 36, 40, 60, and 63, some Spanish, are well worth examination. The specimens have been mainly contributed by Lord Middleton. Seventeenth-century needlework is largely represented. The red velvet Prayer-book (87), embroidered in gold, with silver threadwork in relief (dated 1634), and the miniature of Charles I., an exquisite production in silk, lent by Lady Catherine Berkeley; the coverlet, No. 96, quilted with yellow silk embroidery, are remarkable examples of design and workmanship. We can find room only to mention a richly-embroidered coverlet, of Italian design, in red silk, with blue scroll-work (126), of English workmanship; a floral embroidered valance (137); and a rich blue hanging with folial border, the embroidered work being in straw-coloured silk of English execution. No. 154 is a blue silk coverlet, with yellow scrollwork design in chain-stitch. Various French, Flemish, German, and Italian embroideries are to be seen; a splendid curtain of French design of the 16th century, with floral festoons on a white satin ground, and an embroidered frame worked by Mary Queen of Scots when prisoner in Sheffield, are among the exhibits. We notice, also, a few curious specimens of "modelled" needlework, in which the figures and folial devices are wrought in high relief upon the ground, but the visitor will appreciate more the excellent restorations of old fabrics, and the handiwork executed by ladies of the school. With the aid of the excellent handbook of embroidery written by Miss L. Higgins, and edited by Lady Marian Alford, published by the authority of the school, the present exhibition may be made eminently instructive to students in this branch of art. It may be of service to mention that the ladies of the school undertake church work from architects' designs, and we have seen some exceedingly well-executed work for church decoration.

VENEERING, OR THE PLATING OF WOOD.

WHEN the system of veneering, or plating, a common wood with a thin facing of rare or valuable wood first originated, it would be difficult to say. In the East, it has been customary to face woods with ivory, pearl, and rich woods for ages. In Europe, the French and the Dutch were the first to adopt the system, and it was not unknown in England as early as the days of Elizabeth and James I. The ground was then oak, and the veneering consisted of white holly and ebony wrought in patterns or floral devices for the ornamentation of panels, for bedsteads, chests, and cabinets. This we may call old English marquetry; but it never grew in our hands to the magnitude it attained in France and Holland The old Dutch marquetry or veneering was truly beautiful, and the same may be said of the French inlaying, which developed into buhl-work, consisting of chased brass, ivory, ebony, tortoise-shell, and other valuable materials.

The taste for large surfaces of rich and highly-coloured woods entered on the scene with the opening of the last century. At that time, a great part of the furniture was of walnut, and the new material, mahogany. As both these woods were occasionally figured, the prominent parts, as the panels, the backs, and the rails of chairs, the fronts of drawers, &c., were faced with figured woods. The edges of these veneers give ample scope for indulging in the system of banding; and before the close of the century, the principle of inserting bands, strings, and ornaments, painted and burnt on the face of satin-wood, &c., became very general.

The growing introduction of fir-wood from the Baltic, offered a cheaper material than the older wainscot-oak, or the unreliable walnut, or the native hard-woods, and, with this adoption, the system of veneering became a necessity. We have before us a sideboard dating from about 1780, the top of which is faced with a veneer of Spanish mahogany, 6ft. 6in. long, and 2ft. 6in. broad. These early veneers were necessarily strong, from the fact of being cut on the pit by hand-sawyers; but, looking at the present degenerate race of these men, the wonder is, how they were ever cut by hand? From 1730, to about 1830, it was the classic work of the sawyer, and to rise to a veneer cutter was to rise to a point which marked the summit of their trade; to give us five or six veneers in the inch was the perfection of work, and, in this case, it would require no ordinary men to deal with a veneer of the size we have mentioned above.

As may be supposed, when they came into the hands of the cabinet-maker they were very rough and irregular, to get over which, the smoothing-plane and the toothing-plane, was freely and energetically used.

We here picture the state of things which existed down to the time of I. K. Brunel, the inventor of the circular-saw, an invention that revolutionised the cutting and conversion of wood. Brunel, upon mastering the difficulties that attended upon the introduction of the circular-saw, turned his attention to the detail of veneers. Here he was met with the difficulty of the size of the saws necessary to deal with deep logs of wood, and this difficulty was enough to appal a mind even of the gauge of this great engineer.

Knowing that success can only wait upon diligence, Brunel, at great cost, pursued his experiments in this department for two years with only the approximation of success. His early saws were of the ordinary type, ground fine or thin on the edge. These, by the heat of friction, expanded on the line of the teeth, and buckled or frilled to such an extent as to render their work worthless, and their failure constant. Watching the failure on this head, Brunel was struck with the idea of nicking the saw, or cutting it into the form of segments at the points where it most buckled. These cuts extended from the edge of the saw into its solid part, and dealt only with the portion that was subject to the operation of heat. Brunel was struck with the result, as the saw, so nicked, made fair work, and altogether got over the difficulty of buckling. The great point achieved by this simple experiment or discovery was that the circular saws might be made in segments, and the body of the saw be made of a casting or castings of a great size. The first application of this system to practice convinced Brunel that he had mastered the subject of veneer-cutting by machinery. The soundness of this conclusion has been proved for half-a-century, as nothing in the way of substantial improvement has been added to this machine.

As a branch of trade, Brunel followed veneer cutting at Battersea, and, with the aid of partners, erected a considerable mill there, as early as 1826. In the full development of this mill eleven machines were at work on the ground, the diameter of the saws being from 7ft. to 17ft., the largest of the saw teeth being of the gauge of five to the inch.

The writer, years ago, was at a provincial mill where a machine of this character was erected. The size and cost of this instrument for the simple purpose of cutting thin sheets or slabs of wood, appeared to him prodigious. Upon its being started there was a great hum all over the place, and the behaviour of the machine was anything but satisfactory, as Brunel's buckling was revived. The proprietors struck at the root of the matter, and engaged a very experienced operative. This was an elderly man, who might fairly have used Shakespeare's words in Romeo and Juliet: "He jests at scars that never felt a wound," for he had lost most of his fingers with the instruments of his trade. The working of the new machine in his hands was perfection, the error the maker had run into was simply driving it at too high a speed. The process is to cut the logs into planks or flitches, and by preference to give the same a fair amount of seasoning; the plank is then laid down, and upon it is secured, by glued blocks, a frame or cradle of stout wood made after the manner of a gate.

The frame, with its mount of veneer-wood, is then placed on edge, and secured to the travelling-bed of the machine, and, in due course, brought up to the saw. The veneer leaves the parent wood at somewhat of an angle, formed by the saw increasing in thickness from the edge, and, being thin, can be bent or rolled up as it is taken away to be bound and packed. The cutting by these machines is perfection; there is no waste by the saw running out at the side, or by holes in the centre, as was the case with sawing by hand; and the number of veneers won from the inch of wood is double the number possible by hand: viz., 12 to 16, the former being the most general gauge.

For some years past, Brunel's machine has had rivals, notably in the horizontal saw-frames or machines, which, by the insertion of fine-ground saws, are capable of doing delicate work. Perhaps it is only fair to admit that these machines, as worked by Messrs. Ballhiemer and Co. of Glasgow, are capable of producing one or two more veneers in the inch of wood; but the saleable quality of the same is not so high as those cut by the older machine. The former machine is more capable of ridding itself of its sawdust, and the friction of its ground-flange puts a slight polish on the veneer. The horizontal machine fails to burnish the wood, and hence a dull, dead face exists on the veneer, which detracts somewhat from its saleable value.

A new and highly-successful machine is the rotary, on the principle of the knife—a system highly favourable to wood in the round, and to figure, as in the case of birds-eye maple, found only on the face of the logs. The number of the veneers in this case is greatly increased, as there is nothing lost by the saw, or with the rib or set of the same marking the face of the veneer. The evil here is, that the length of the logs is restricted, and the wood cannot be planked and seasoned; the system of steaming the wood and cutting it, having, in many cases, to be resorted to, to prevent breakage on one face, an evil that is very apparent if a thick gauge is worked upon. With regard to the number of veneers cut from the inch of wood, the rotary system offers the greatest contrast, and the advantage gained over the old hand-system is

marvellous. It will be remembered that six was the standard number won by hand, whereas the rotary machine, if working on close hard material like pheasant-wood, will produce 40 to 60 veneers. The writer has worked upon such examples as the latter, and he can only add that they require manipulation of the first order; the old instruments, the hammer, toothing plane, and the scraper must be laid aside, and the veneer bedded down by the call, and simply faced with fine sand-paper when dry. We need only say that inlaying or banding is out of the question with such fine-drawn examples of veneering, although the system is largely followed in connection with knife-cut veneers on the flat, a system highly favourable to such wood as walnut burrs and slabs of Austrian and Pyrenean ash.

Such, then, is an outline of the changes which have been wrought during the present century in the subject of veneering or plating of wood. Every step has been in the direction of improvement, and these steps have been so quick and so efficient, that, from the chaos which ruled a century ago, we have emerged to a state of efficiency, beyond which, further progress or improvement appears impossible. As a concluding note, we cannot lay down our pen without paying a tribute of high praise to the genius of Brunel; for no other man ever took up the subject of veneer-cutting at so low a point, and laid it down again on such an eminence.

ROYAL ACADEMY LECTURES ON ARCHITECTURE.*

THIRTEENTH-CENTURY ARCHITECTURE—ITALY.

I HAVE brought you so far on the path of development in my last lecture, that we find ourselves at the end of the reign of the round-arched styles. It is natural, even in treating on Pointed architecture, to take Italy before any other country, not because the history of Gothic architecture is seen and studied better there than elsewhere, but because it was from that time for many centuries a sort of central region in all questions of art. We shall find, indeed, as we go into the question, that, so far from taking a leading part in the development of Pointed art, Italy was always lagging behind—that she produced no very good or original work, and that for some of her best buildings she was indebted to foreigners. Nevertheless, in few countries is there more to interest us. The state of art was not unlike what it is with us No one style held undisputed sway. There were foreign influences at work which introduced strange novelties into a large part of the country. The extensive seaboard; the mercantile character of the people, and their unmatched situation at the centre of all commerce and of the then chief lines of traffic; the independent and warlike character of the republics—among which Venice, Amalfi, Genoa, Pisa, and Florence were the most active; the habit inherited from their ancestors of borrowing rather than inventing—all added to the varieties of style seen in their buildings, and to the development by degrees of local peculiarities.

Just before the period we are dealing with, Italy had been torn and distracted from one end to the other by foreign princes or foreign invaders, by intestine troubles and constant wars. In the eleventh century the Greek Emperor still had his Capitan at Bari on the east coast. The country was harassed by Saracen inroads, and was relieved and then occupied by adventurous Normans; and the German Emperors were ruling a great part of the land. The era itself is as distinguished for the personages it produced as for the troubles among which they led their lives. The Swabian Frederick II. stands out not only as a central figure in the history, but equally as one of the most lavish promoters of building of palaces, of castles, of churches, and even of mosques. And the artists by whom the time was glorified are, as we shall see, innumerable, while their status was much more like what it is with us than it was elsewhere at the same time. On all sides from the earliest period we meet with the names of the architects and sculptors whose works still remain, and are able to trace them working, now here, now there. Their names are recorded in countless inscriptions—not only in documents, in which Italy is so rich, but on churches, over their doorways, on pulpits, on friezes, on monuments, on columns, and on baldachins. The architecture, instead of being that of the country or the province, seems, as we study it, to become that rather of the individual architects and their followers. Thus we have at a very early period the Maestri Comacine, Freemasons with curious charters and privileges, whose head-quarters on the Island of Comacina, on Lake Como, gave them them their name; the Campionesi of Campione, opposite Lugano, who from 1244—when Anselmo da Campione contracted to work at Modena *in perpetuo* for six lire a day in summer, and five in winter—reigned, as it were, until the fifteenth century, having among them Enrico I. and II., and Giovanni I. and II.; the Antelami of Parma, one of whom built the Baptistery in 1196; the Cosmati family, of Rome, who succeeded each other for about 150 years from A.D. 1150; and, finally, the clan of Masuccio, of Naples, among whom, as among the Campionesi, we have Masuccio I., II., and III., always spoken of as if they were a sort of succession of monarchs. The personal element, which always adds so much to the interest of artistic studies, is seldom absent, and it is because it is all but entirely so at the same period in most other countries that the study of Italian art in the thirteenth century is so interesting.

In my last lecture it was at the erection of the Cathedral of Pisa by a Greek architect, Buschetto, that I paused. His work has been too often talked of as if it were in any true sense Romanesque. It is, in fact, almost exactly what we might expect from a Greek or from an Italian brought up in Greek traditions, who wished to conciliate popular taste by conforming to some extent to Italian customs. His plan is evidently founded upon the early Roman churches; it is cruciform, has transepts of great projection, and apsidal terminations to them, as well as to the choir. But with the love of a Greek for the dome, he insists on retaining it, though he is bound by his basilican plan to carry his ranges of columns on from east to west, without any internal mark of the intersection of the transepts. It is in the plan only that any deference for Roman precedents is seen. His walls are all arcaded externally, the arches in the true Byzantine fashion, very thin and flat, and for ornament only. Under every arch there is a lozenge-shaped panel of coloured stone or marble. The spandrels over the arches are all inlaid with patterns of extremely elaborate character, and the sculpture of the foliage has everywhere the excellence of execution, the conventional symbols, and the variety of design so invariably seen in Byzantine work. This great church was finished at the end of the twelfth century. At the same time, all over the south and east of Italy, the same sort of style, produced by the same Eastern influence, was almost universally adopted. Observe also that it is one of the most singular facts in the story of our art, that over the whole of this district hardly any real or active influence was exercised by the pointed arch. It was used, it is true, but not universally, *e.g.*, at St. Maria Aquila, in A.D. 1315; and at Bitonto, so late as 1335, we have buildings mainly constructed with circular arches, a fact hardly to be paralleled in any other part of Europe, though in Southern Italy any number of similar examples exist.

I have said thus much about Pisan art in the twelfth century because it was in Pisa that one of the central figures of the time was born and trained. This was Niccola Pisano, born about 1205. Not very much is known of him or of his origin; but that little is somewhat wonderful, if we are to credit the statement that already, when he was only about fifteen years old, Frederick II. made him his architect, and took him to Naples, where he was employed on the castle which Frederick was building there. Thence, at twenty-six, we find him going to Padua to build the great church of Sant' Antonio; then to Arezzo, to build San Domenico. Then we find him developing his skill as a sculptor, executing pulpits for Pisa and Siena, and designing, and, with the powerful aid of his son Giovanni, executing the great fountain at Perugia. I might fill in this chronicle of his work with many more details; but, short as it is, how interesting, is it not, to us? He has been brought up, as we see, in Pisa, in the presence of the Catredral and of the Baptistery, and of the circular tower begun in 1174 and completed probably before his eyes. He studies it, and then, after a few years at Naples (where he was surrounded on all sides by art of the same sort, as at Benevento, at Salerno, Amalfi, and Caserta Vecchia), he goes to the north of Italy. He visits Venice, for his first great work, the Church of Sant' Antonio, is evidently founded on a study of St. Mark's. But he is a thoroughly eclectic artist, picking up ideas where he can, and adapting them to his own purpose. He thinks the group of domes at St. Mark's might be improved if they were loftier, and if one was in some way more striking than the rest. Then he recollects the great cone which covers the central portion of the circular Baptistery at Pisa, and, with striking effect, places it in the centre of his group of domes. Then he hears, no doubt, of the wonderful effect the French architects were producing by the beautiful plans of their chevets—apses surrounded by aisles and chapels—and determines to imitate them. I say he "hears," for it is inconceivable that, after having seen any of them, he should have planned anything so clumsy and ill-conceived as the chevet of Sant' Antonio,—a succession of square chapels as badly designed as they well can be, and which yet, in the following century, seem to have been the model on which the never-completed choir of San Petronio, Bologna, was to have been founded. Then, on the exterior, the façade recalls the outlines of the Greek churches in the south with which he was familiar; whilst on either side of the choir he builds with most picturesque effect octagonal towers or turrets, unlike anything in the south, and surpassing any of those which had been erected somewhat on the same lines before his time in Lombardy and along the course of the Rhine. The whole effect of this great church is singularly Eastern—more so, even, than that of its prototype. Thus grew this great church—still perfect, but, in spite of all its interest, lacking somewhat of the impress of a really great architect's hand, and not fit to be compared for an instant with the far more refined and scientific churches which the French architects had been building during the fifty years before its foundation; but, nevertheless, remarkable for the beautiful grouping of the external outline—a point seldom regarded by the early Italian architects. It was after the design had been made for this church that his best works as a sculptor were executed. And here, again, we find him distinctly incorporating figures and ideas which he derived from Roman sculptures preserved in Pisa. To these he added, no doubt, so much and such intelligent study from the life as to give great interest and pathos to his work, when compared with most of the Italian work that had immediately preceded it, though I am quite unable to admit that he was so much superior as is commonly asserted to the French sculptors of the same time, of whose names, and story, and training we know so little. His two great works, in which he shows us the skill of the architect and sculptor combined, are the pulpit in the Baptistery at Pisa and the fountain at Perugia; and of about the same period is the purely architectural work of Santa Caterina at Pisa.

The Italian pulpits of this century are among the most magnificent relics left to us. The examples which led up to Niccola Pisano's work are of the type of Guido da Como's at Pistoja, a square erection supported on columns resting on beasts, and with its sides covered with sculpture. Niccola followed the idea, but improved upon it. He made his pulpit hexagonal, and carried it on trefoiled centres resting on shafts supported on lions' backs. In this way he gave far more architectural character to his work than Guido da Como had done; and not only is his sculpture better; it is the combination of the two arts that most strikes us, while the delicate taste with which coloured marbles are used to enhance the beauty of the design is remarkable. The sculpture itself you can study, I believe, at South Kensington. It shows a sense of the value of grouping, and of the natural treatment of emotions and action, which under his Italian predecessors had been almost wholly neglected or despised. The type of figure which most affected him was not beautiful, and he always exaggerated extremely the size of his heads.

* By Professor G. E. Street, R.A. Lecture No. 4, delivered on Thursday, Feb. 24, to the students of the Royal Academy.

But with any such criticisms as these one must admit, nevertheless, that his work paved the way for all that was most excellent in the men who came after him. He learned something, no doubt, from such a man as Giunto da Pisa, who was flourishing when he was young, and Cimabue and his successors were aiding with equal power and zeal the work that he was doing.

Niccola Pisano died in 1278, and in the six years before his death his name is connected with two of his most exquisite works. At Padua he had erected a great false front to Sant' Antonio, in which he sacrificed everything to breadth of effect. At Sta. Caterina, Pisa, in 1272, he has left us a façade which is still false, as being a great gable which has no sort of relation to the shape of the building behind it, but the beauty of which is incontestable. Its simple, unbroken outline gives the breadth of which Niccola was so fond. Its lower stage is very quietly arcaded; above this is an arcade of trefoiled pointed arches, carried on detached shafts, standing so free from the wall as to give most vigorous light and shade; and above this again a circular window in the gable, flanked and surmounted by arcades like those below. For an architectural composition, taken by itself, I know few more charming works than this. The steep gable looks like the effort of a man who had seen the steep gables of Northern Gothic, and wished to vie with them in this respect, as well as in the light and shade that northern climates require, but with which Italian architects generally seem not to concern themselves. Here, as in other works, we can trace the influence under which he worked. The Leaning Tower stood within a few hundred yards of the spot on which he was building, and his arcaded front is a very simple development of the effect which he admired in the arcaded walls of the Campanile—Niccola's arches being pointed and cusped where those of the Campanile are round, but otherwise being practically of precisely the same order of construction. Niccola's other great and crowning work is the Great Fountain at Perugia. You can hardly imagine a more charming work in every respect than this. It stands in an irregular piazza, midway between a cathedral of fair architectural interest, and the vastest Gothic palace after the Ducal Palace at Venice that I know. This, I suppose, was rising about the time that the fountain was erected, and at the same time the cathedral walls were being encrusted with a gay diaper of coloured marbles. The fountain consists of two enormous basins, the upper one supported by an apparently countless group of columns standing in the water which fills the lower one. The capitals and columns are of various shapes. The upper basin has figures at intervals all round, whilst the lower basin has a long series of square panels, separated from each other by clusters of moulded, chevroned, or spiral shafts. Out of the centre of the upper basin rises a smaller one of metal, out of which the fountain plays. The whole of the panels in this elaborate work are square, surrounded by mouldings, and Niccola Pisano showed his sculptor's sense in avoiding the common snare of introducing pointed arches for decoration where none are required. Covered as his work is with elaborate sculpture, what is most felt is the extreme order and simplicity of the whole; and when you go on to look in detail at the charming sculpture of saints and heroes and tutelars of the Church on the upper basin, and of the labours of the months, the signs of the zodiac, the arts and sciences, Romulus and Remus, and I know not who beside, on the lower basin, and notice how refined are the attitudes of the figures, how delicate the features, and how completely the whole are wrought into one perfect piece of architecture, you must be blind indeed if you do not recognise the grand chartcter of the art of this central figure of the century. It is true that the design is mainly what we owe to him, and that the execution of most of the sculpture was probably entrusted to his son Giovanni, and some possibly to Arnolfo di Lapo; but not the less is it a crowning work both of his life and of the century that he adorned.

I cannot leave Niccola Pisano without a few words about his son Giovanni. He, too, was a great artist. To my mind, it is in his work as a sculptor that there is most to admire; but, like his father, he was both architect and sculptor. His two most important architectural works are the Chapel della Spina and the Campo Santo at Pisa; and I suppose there is little doubt that it was he who, with singular skill, converted the exterior of the Romanesque Baptistery in the same city into a most picturesque and graceful Gothic work by the addition of a crowd of traceries, of pinnacles, and niches all round the base of its sombre dome. I suppose that all of you know the Spina chapel. Before its too wholesale restoration it was impossible not to love it for its eccentric beauty: but it was a beauty obtained in defiance of every law that in my former lectures I have told you to observe. There is hardly a stone in its exterior that can be said to be structurally true. The steepest gables ever seen are put up at the east end of the building, with a roof of very moderate pitch; behind them are three spires, and then all along the side walls, to conceal the flat roof, a whole range of niches, surmounted by pinnacles of a fashion dear to Italian architects, and very pretty—where a statue is placed between four detached shafts, which carry the crocketed finials of the canopy. In all the work of the Pisani, mistakes are made such as are never seen out of Italy. There is a most singular confusion of round and pointed arches. Their traceries, as we see them in the Campo Santo, are by no means well designed. They are indifferent about the subordination of orders in the tracery, and pack circles together as if they were entirely separate parts of the work, instead of combining them, as the Northern architects did, in perfect order, by means of continuous intersecting mouldings. Then their capitals seem always to be made with hardly any reference to the work they have to do. You have a large capital carrying a shrunken and insignificant archivolt. And this is the more remarkable, because elsewhere, at the same time, one of the most marked features is the way in which every capital had its exact and separate function, to which its size was accurately adjusted. In good architecture this must be the case, and I am obliged to sum up the work of the Pisani by saying that, with all their merits as sculptors, they were not equally good architects; and that in planning, in construction, and in obedience to the precise law of making their ornament grow out of their structure they sinned only too often; though at the same time the decided way in which Niccola at once threw aside the traditions in which he had been nursed is as remarkable as it is honourable to his artistic zeal and insight.

I have said so much about the Pisani because they so exactly fill the canvas in this century; but, widespread as their work was, it would be a mistake to suppose that a description of it has at all exhausted what has to be said on the subject of Italian Gothic. A most remarkable fact, indeed, is that whilst they were building in the way I have described, there were rising three churches of quite different but most admirable character in every respect, one at Vercelli (1219-22), another at Assisi (1228-53), and, lastly, Genoa Cathedral, of which the date is not certain.

Vercelli was built, according to the tradition, by an English architect. I do not quite believe this, though undoubtedly its details suggest a foreign hand, and are admirably good. It is built of brick and stone coursed; all the sections of piers and mouldings and the details of the vaulting are admirable, and none of the faults are committed of which the Pisani were guilty every day. The ground-plan is, in most respects, wholly unlike an Italian architect's work. The vaulting compartments of the aisles are square and those of the nave oblong, north and south, contrary to the Italian rule. The choir is square-ended, but the chapels of the transepts are apsidal. The detail of the clustered columns, with their capitals and bases, and the groining of the windows, are all completely like French work, and very admirable, and the eastern triplet reminds me of England. It is only on the exterior, in fact, that any Italian character is given to the design; but even here there is far more attempt than is usually made to secure a picturesque *tout ensemble*. The west front is flanked by two lofty Italian towers or turrets. There is an octagonal central lantern, and, on the south side of the transept, a campanile placed at an eccentric angle with the rest of the work. A fine cloister and a chapter-house make this church very complete. Its builder was a Cardinal Guala, who had been for some years legate in England, and who erected this church on his return, having evidently a wish to emulate some of the work he had learnt to admire in England and France.

San Francesco, at Assisi, is even more remarkable. The architect here is said to have been a German, but the evidence of the mouldings is, on the whole, more in favour of his having been a Frenchman. The singular fact, however, is that, as at Vercelli, this influence did not affect the exterior, which is designed completely in the local style, of which I shall have more to say.

At Genoa, again, we have a work of extraordinary beauty, and so skilfully planned and designed that it is almost impossible to suppose that it can have been wholly invented by its architect. It is evidently a work which is the outcome of a series of developments, and yet not one of the steps which could lead up to such a work are to be found in the neighbourhood or in Italy. It is, again, the work of a man who, if not a French architect, had at least been trained in France, and is so good that it cannot be dismissed without a somewhat careful notice. In the first place, it is to be observed that it is entirely built of black and white marble (the black, a limestone from Lavagna, which is well bonded into the wall, and, indeed, forms its substance, whilst the white is from Carrara, and is used in thin slabs, 3½in. thick, between the more solid courses of black), and that the system of using alternate courses of these two materials is carried here to the extremest point. This fashion was obtained, I have no doubt, by the Genoese from the East. You recollect what I told you in my last lecture about their wars and their commerce with Arabia and the East. And there is no fashion more noteworthy among the Arabian architects than this of the use of coloured materials in the way we see adopted at Genoa. Niccola Pisano and his followers had used a different system, and one which to me seems preferable. They used the two materials, but usually the black was in narrow bands on a field of white, placed where it aided by an emphatic line some architectural feature. This plan was adopted at Pisa, Lucca, and Siena. The Genoese adopted the more Eastern system of nearly equal courses of black and white. All their churches are built in this way, and from the simplest designs, such as that of San Matteo, Genoa, up to the extremely elaborate treatment of the detail in the cathedral, all agree in this; and so prized was the system that in course of time it became an aristocratic privilege in Genoa to build in this fashion, the four great families of the Fieschi, Doria, Spinola, and Grimaldi alone sharing it with the municipality. No doubt the churches were under the protection of some one of them, and the cathedral probably of the governing corporation of the city. Cathedrals in those days were sometimes strangely used. At Genoa general assemblies of the people were held in the nave. Questions of peace and war were there settled by popular vote, and religious and political purposes seem equally to have been served by it. The nave was "renewed" in 1307, as an inscription tells us, but, I have no doubt, on the old lines. The west front and the western arch of the nave, with a groined gallery, are all of the first half of the thirteenth century. The architect—whoever he was—was bound by the black and white system of decorative construction. That, as we have seen, was a point of honour with his clients. He not only adopted the system of construction, but carried it on throughout his work by covering all the plain spaces between the shafts of his doorways with black patterns inlaid on white, and white on black, and in his arch mouldings he counterchanges the colours. The design for the front had three doorways, separated by buttresses. In order to show his decoration, the architect makes the jambs of his doorways simple splays, against which are set marble shafts—three large and four small—on each jamb. He leaves a good space between them, and on these spaces inlays an infinity of elaborate patterns. His bases are beautifully moulded with foliage carved under them, and in the carving of the capitals, and of a tree of Jesse on the jamb of the great doorway, we see the hand of a skilful sculptor, whose work is entirely different from anything that the Pisani were doing at the same time. The arch mouldings are all finely drawn, carved, and chevroned, and some of the marble shafts are spiral, and some carved. Above the central doorway there was the invariable Italian feature, a rose window, and the design included apparently the equally French feature of two

western steeples, of which one only was in part built. Had the whole been completed as it was begun, we should have had in it one of the most exquisite works of the century; and interesting, as it seems to me, beyond measure, from the evidence it affords of the natural fusion of two systems of architecture—French and Eastern or Arabian—in a perfectly fine work. Whenever any of you have the opportunity of studying this work on the spot, I counsel you first of all to makes yourselves acquainted with the two earliest doorways in the west front of Rouen Cathedral. There, in the most perfect French work, you will see how the Northern architect, having only one material—and that stone—nevertheless contrived to obtain the same effect of black patterns on a white ground by deeply-cut patterns in the stonework. And there is so much analogy between the two works that I am disposed to think that the architect of Genoa had seen the work at Rouen before he designed, in a somewhat similar spirit, his great work at Genoa. I ought to have added that his nave arcades are carried upon circular columns, which, with the arches above, are all built of alternate courses of black and white; and that a second arcade, opening to the aisle, takes the place of a triforium. Perhaps it is too ingenious to suggest that the architect of the nave of Rouen had adopted the same singular device; and though his work was later in date than the two doors, it was no doubt earlier than the nave of Genoa.

Another very decorative front of about the same period, which ought not to be forgotten, for it is equally unique in its way, is that of the cathedral at Ferrara. I have been unable to learn anything as to its history. It is an alteration of and an addition to an older façade, carried up high above the roofs in three great equal gables, arcaded and enriched with great boldness and beauty on every portion. In the central division an elaborate porch of two stages in height projects boldly from the front. This is gabled on three sides, and has a sculpture of the Last Judgment scattered about in its upper compartments. I hardly know any front in Europe on which so much work has been lavished. And though it is impossible that it should be otherwise than very striking and interesting, it is impossible to regard it as a piece of genuine work or construction. It is a front put on against the church, with no sort of connection with it in outline or design. It depends not on good proportions, but on extraordinary richness of detail for its effect. Its architect was not satisfied to leave a stone unadorned throughout the whole upper part of the building. His windows and arcades are crowded with shafts; the mouldings are rich and effective; and yet, beautiful as the work is, it has the character of an imported design, and there are no other buildings in the country which lead up naturally to it.

I hardly like to omit all mention of the cathedral at Ancona. Here, on the very edge of a country almost given up to Byzantine work, Margharitone, of Arezzo, is said to have built the front of the cathedral—a charming composition, with a projecting gable carried on detached shafts, a rose window above, and a very steep path to the porch and to the front. This is soon seen to be altogether a false arrangement. The design, if not seen in perspective, is very beautiful and well proportioned. The gables have all sloped corbel tables, and the whole effect is surprisingly unlike any common Italian work; and yet the masonry was done by an Italian hand and no other. The doorway has an array of eight detached shafts set against a splay, as at Genoa. The shafts are alternately large and small; some of red marble, some of white, some spiral, and some octagonal; and the base is made of red and white marble and grey granite. The section of this jamb is like that of the west doorway at Genoa. All these works have some features in common which are not usually met with in Italian Gothic. These are the use of clustered columns, as at Vercelli and Genoa; clustered piers, as in the doorways at Amona and Genoa, each shaft in which carries on its own capital a well-defined member of the arch; the use of buttresses, which at Vercelli are of considerable dimensions, and at Genoa are marked features—a rare occurrence, the Italian buttress being usually a mere pilaster round which a heavy cornice at the top of the wall is returned. Finally, the mouldings are good in the sense in which the best French mouldings are good. They are well drawn, have good light and shade, and are accurately fitted to their places. In all these respects these buildings are entirely unlike the work of Niccola Pisano, and in my opinion far more refined than it is. Moreover, there is no flavour whatever of the revived Classicalism which was always evident in his work, and the effect of light and shade, which is striven for and obtained, is quite refreshing in the midst of the platitudes (if I may so call them) of the Italians.

The conclusion at which you may arrive from what I have been saying will be, perhaps, that the less indigenous Gothic architecture is in Italy the more beautiful it is. To a certain extent this is true, but to a certain extent only. There are other effects obtained by the Italians which well deserve admiration, and in every one of the buildings just restored it is to a part only, not to the whole, that it is possible to refer in terms of unmixed praise.

(*To be continued.*)

HISTORICAL DOCUMENTS.*

Among the discoveries of these later times there is one less noticed than steam and electricity and all their works. This is a new way of looking on the past—a new method of writing history. Till quite recently, history was supposed to deal only with grand and heroic events. The actors, seen through the mist of the past, seemed larger than common men. The style proper for history was grander and more majestic than that of ordinary life. People spoke in heroic language, which it was the historian's duty to invent for them. If the speeches were proper to the occasion, it did not matter that there was not a particle of evidence for their authenticity. One wonders if Livy's readers believed that the speeches which he puts into the mouths of the speakers were ever really spoken. Probably they neither asked themselves the question, nor cared for the answer. It was enough that they were well written, and fitted the occasion. How strange to us now is the old notion of Parliamentary reporting—that Dr. Johnson's idea of what a speech should have been should have passed as the actual Parliamentary utterance. It was no doubt better, and the fact that it was not what was actually said seemed to the readers of no importance. Such an artistic presentment of events, according to the writer's notion of them, may have been better than the reality, but it is not history. Give us the simple facts, tell us what really happened, the actual words the people used,—make us realise the circumstances as they really occurred. A Roman emperor in a full-bottomed wig seemed no incongruity. But to us it is absurd. To represent the scenes of the New Testament among Mediæval architecture and with Mediæval costumes, though it offends us less, we know to be untrue and valueless as historical records of the times they profess to represent. But the smallest actual fact, however ordinary and common at the time, which happens to have come down to us, is of absolute historical value, as an actual portion of the perished life of former times. It enables us to realise it, and the commoner the fact the more valuable it may be for this purpose. The Mediæval representations of Scripture scenes are of no historical value for Scripture history, but they are of absolute value for Mediæval history. They are perfect and incontrovertible evidence of Mediæval ideas and modes of thought, of Mediæval dress and architecture. Whatever has come down to us from any former period is of value for the history of that period, even of more value the more common and commonplace it is, for it brings us close to the ordinary lives of the people. The penny loaves from the baker's shop at Pompeii, the pots and pans from the houses, a pair of Etruscan old shoes, an Egyptian wig, the flint knives and arrow-heads of the old Cave men, a child's rattle from an aboriginal lake-dwelling, are more eloquent to us than the grandest passages of historians. These things, when we can touch and handle them, help us to realise the perished life, to feel near it. Writings of no value at the time, dealing with unimportant events which, after they had served their immediate purpose, were mere waste-paper, become, by their accidental preservation, valuable historical documents. Such are the Paston Letters—mere ordinary letters from a boy at college to his mother at home, the accounts of house expenditure of an ordinary household, the inventories of household goods when on the death of their possessor they passed to the next heir.

But it is a modern notion to attach value to such useless old rubbish. Formerly, the newer a thing was, the more it was prized. This was even the case with regard to important documents. It was the custom to re-write old deeds and charters on new skins of vellum, the old ones being then counted worthless. It was the same with the manuscripts of the Scriptures. Those we have are mostly quite modern. It is mere accident, and no special care, which has preserved the one or two old copies which exist. A new copy was always thought better than an old one, just as we think a new coat better than an old one; and when they got the new copy, the old one was regarded as of no more value than a Church Prayer-book with the prayers for the Royal family out of date. Its only value was the parchment or vellum, which, as far as it was good, was used up for new writings.

The same feeling continued till quite recently with regard to some kinds even of works of art, such as gold and silver plate. Only a few years ago silversmiths put as an advertisement on their bills, "Family plate melted and re-made." What family would melt their old plate now? Yet, historically interesting church-bells are still sometimes remelted for the sake of the old metal.

I was told that the fellows of a college at one of the universities, not long ago, had their old plate melted down into useful articles of a neat modern pattern; and another college, a year or two ago, being somewhat behind their age, sold some of their old plate to a dealer at the price of old silver for melting. The dealer, however, was not behind his age, but realised for it the quadrupled or quintupled value of ancient plate. Silversmiths lament now the tons of Queen Anne teapots and three-pronged forks they have melted for old silver, for which they could get now twenty shillings an ounce. The rage for the art of this period may be, to some extent, mere fashion, and may pass. Fashion may run up the prices, at one time, of Etruscan vases, at another, of blue china, hawthorn pots, or Chelsea shepherdesses; but this new reverence and value for old things, because they are old, and the older the more valuable, *cannot pass*, now it has become evident to those who think on these things that the actual relics of any age, of whatever kind, are the only thoroughly reliable historical documents of that age.

Such documents may be of almost any kind; anything that tells of the life and ideas of the time. For this purpose they need have no intrinsic value; they need not have beauty or art; it is enough that they be authentic. We may think them ugly; for any purpose of ours they may be useless; but we have no right to destroy them—not even if, besides being ugly and useless, we can see no historical significance in them. That may be the fault of our ignorance; just as an Arab, who had found an ancient Egyptian wig, might regard it as merely worthless old hair. We have no right to destroy them: we are merely their custodians. Wider knowledge, some farther light, may give them value to those that come after us.

This new mode of looking on the records and relics of the past is shown in the museums for their preservation which have been established in every country pretending to civilisation. These are quite modern institutions, unknown at any former period of the world's history. Old things have been preserved formerly for many reasons, and in various ways, else we should not have them now; but never till these latter days have special buildings been devoted and great expense incurred for the sake of preserving things which are of no practical use, which are often not beautiful, but because they are historical documents, which illustrate and enable us to realise the past history of mankind. The one essential of such records which makes them worthy of a place in our museums, is that they be authentic, that they be not spurious copies or imitations.

Now of such historical documents old buildings are amongst the most valuable. We cannot put them in a glass case like a museum specimen, but they are as well worth preserving authentic and unaltered, by whatever means we can, as any of the objects in our museums of which

* Paper read at the Royal Institute of British Architects, March 28, by John James Stevenson, F.R.I.B.A.

we take such care. Better than anything else, they enable us to realise the life of former times. An historical event becomes real to us when we enter the room where it actually happened. This is one of the chief pleasures of travelling. Why do crowds go to Abbotsford? Not certainly for the beauty of its architecture; but because we come nearer to one whom we all feel to be a personal friend and benefactor. In an old building we seem to become acquainted with those who built it and those who have lived in it. We see their ways and habits, we can better imagine how they thought and felt. Imperfections and dilapidations from continued human use, when seen in this light, often acquire positive value. I remember in the belfry of a little country church in France that the bell-rope, rubbing against the side where it came down through the vaulting, had worn a groove a foot deep in it. What countless tollings of the bell it told of. Probably that stone is "restored" now. In the door to the dormitory at Westminster Abbey, opened out a few years ago, the steps are worn down at one side, showing that one leaf of the door was usually kept closed. Not a very valuable historical fact, it may be said, yet some have felt touched on realising that here the file of monks passed daily. I confess to a strange feeling of awe and interest when at Rome I saw the wheel-ruts in the paving-stones of the slope to the Capitol, where the Roman triumphs must have passed.

When we have the actual buildings we can people them. It helps the imagination in realising the life of perished generations to know these were the wall and roof they saw; this was the floor they danced and dined on. When lord and servants dined at the same table in the great hall, there may have been mutual confidence between them, but there can have been little culture in either. The little windows which from the private apartments overlooked the hall, showed that the lord would be master in his own house. At Fyfield, near Oxford, such a window, which commanded the solar was lately removed, and inserted in the outer porch, which seems quite needless falsification of history.

The successive alterations in succeeding centuries do not perplex us. We can trace them all: they are all authentic. But when the restorer enters, confounding the whole into his own notion of what the building once was at some one time, destroying the authenticity even of the original work by scraping it and painting it like his own new work, instead of the pleasures of the imagination, we have only perplexity and a deep sense of the folly that would not leave the old building alone to tell its own tale.

The history, through succeeding centuries, of the religious thought and the social life of the people, was once written in our churches. Each age had added its record, but not so as to obliterate the older writing. We can read the religious history of the country in its churches, in the great choirs of monks in the monastic churches, and the small space reserved for the people, the evidence of the gradual assertion of their rights shown in the cathedrals, and of the more rational faith which is still that of the Church of England, but the signs of which, no matter what their richness or beauty, for the last forty years have been everywhere destroyed as "vile rubbish, that got stuffed into churches in the last century or two," as Sir Edmund Beckett, in his "Book on Building," p. 300, describes this work. I would ask Sir Edmund Beckett, Are these not centuries of English History? What right, then, has he to destroy their records? In an old church we live back again through all the centuries of English history: each generation in its day we feel trod this floor, looked up into this vault; these are the original painted decorations from which the whitewash has lately been uncovered, of which parts remain uninjured. The smallest portion of such authentic original work is invaluable. We thank the generation who, when it became shabby-looking, instead of destroying it, saved it for us under the coats of whitewash. What destructive stupidity it seems to obliterate these records by making new copies over them, not in the same lines as at Bruges, not in the same colours as at Salisbury, or obliterating them by the new blazing crudities at the hospital of St. Cross.

The principle on which restorers have almost universally worked, that they should bring an old building into harmony by removing later additions and excrescences, and replacing these by new work of their own, has made the buildings, when they have worked their will, insipid and uninteresting; it has destroyed their charm, their individuality, and their art. As to this, tastes may differ; but there can be no question that this treatment destroys an old building as a continuous historical record. The alterations and additions of the successive generations do not confuse us. Each is clearly written in the handwriting of its own time, and we can decipher the older record under the newer. The modern restorer, by his scraping and rebuilding of the old work, makes it indistinguishable from his own work, and destroys the whole accumulated record by his power of forging the writing of any age, reducing it all to a modern imitation of some single period. We have no right to do this. These records are not ours. Our duty is to preserve them and hand them on to posterity. We may not like them: we may think them ugly; but that is a consideration which has no place in regard to an historical document. We must not alter or falsify it to conform to our notions of what it ought to have been.

This principle of the value of old buildings as historical documents seems so obvious, if we care at all for the records and history of the past (and surely every civilised and educated creature does), that I almost feel I should apologise for insisting on it. But among the generality of people connected with building it is scarcely acknowledged and but little practised. If it were, their treatment of old buildings would be different. From their habits and training they look on them as existing only for use or beauty.

This new appreciation of the value of historical documents is shown by the large measure of support which has been given to Sir John Lubbock's Bill for the Preservation of Ancient Monuments. A few years ago, any member attempting to press such ideas in the House of Commons would have been looked on as an enthusiastic bore, and there are still members who regard them as mere nonsense in comparison with the sacred rights of property.

The architecture of each period is influenced by the religious, historical, and literary notions prevailing at the time. But not immediately. It lags behind the general culture. It was long before the revival of Classic learning in Europe found its expression in pure Classic architecture, or the Romantic revival of the last generation was embodied in the accurate and intelligent reproduction of Mediæval buildings. And similarly architectural practice is to a great extent unconscious still of the value of old buildings as historical documents—a value long felt by many men of culture, but which has only lately found vocal expression in the Society for the Protection of Ancient Buildings, founded by Mr. William Morris.

I cannot give a better instance of this unconsciousness of the value of old buildings as historical documents than a sentence from Sir Edmund Beckett's "Book on Building."

"Rich people," he says, "who know little of these things from their own experience, may take my word for it, as a builder of no small experience both on a large and small scale, that the restoration of a great old church . . . . will pay them infinitely better interest for their money in every way that they can wish to have it than anything new that they can build. (Of course I am only speaking of ornamental outlay in building.)

"Just now there is St. Alban's Abbey. . . . It wants at least £30,000 to restore it safely and thoroughly. Set the best architect you think you know to build you the finest church he can for £30,000. Do you imagine you would get anything comparable to St. Alban's?"

There is no hint here of an old building being of historical value, and in his second edition Sir Edmund Beckett notices the idea only to abuse it. He looks on St. Alban's as so much work done to his hand as a basis for carrying out his own ideas of architecture. And in the restoration which is going on, he is carrying out these ideas. The Building News of Nov. 26, of last year, gives an elevation of the new west front with the statement "Sir Edmund Beckett, Bart., architect of this." The description which accompanies it, which is obviously written by the architect, states that as no traces remain of the original Early English front, the restoration must be an invention of everything except the very Late Perpendicular window, and that this is in such a state of decay that "any restoration of it would be only rebuilding a modern copy of what has been pronounced, by as high an authority as any in the world, a very bad specimen of a very bad style." I may observe that the ruinous state of this window is denied by others. The notice goes on—"Sir Edmund Beckett, who has become legal master of the position, through the cessation of the subscriptions and committee being left, not only without funds, but in considerable debt, has determined not to rebuild it, nor to attempt an imaginary restoration of the unknown Early English design, but to adopt the Early Decorated or Geometrical style."

In all this there is the frankest ignoring of St. Alban's Abbey being an historical monument. It is merely a subject for Sir Edmund Beckett to try his hand at architecture on. And it is the same with other parts of the church. "Sir E. Beckett," says the same notice from which I have quoted, "has already inserted windows in the four dark bays at the west of each aisle, which Sir Gilbert Scott objected to because there were none before, either because they were impossible by reason of some abbey buildings standing there, or, after they had fallen, and let down the walls and vaulting, the walls had been rebuilt roughly with no architectural character."

Snrely the position of the abbey buildings is a question of some archæological interest, for the determining of which Sir Edmund Beckett's new windows destroys the historical evidence. "Now that the windows are in," says the notice, "they are universally considered a great improvement." Not universally: there are some whose knowledge and taste give authority to their opinions, who thought that those dark bays gave special character and interest to the church, and who do not sympathise with the commonplace notion, however universal it may be, that peculiar features should be destroyed, and all our churches reduced to a dead level of uniformity.

In a letter to the *Times*, in the controversy about the west front, Sir Edmund Beckett says that his design has been admired by every one who has seen it, except one or two influenced by jealousy; that the exhibition of Mr. John Scott's rival design brought over all opponents.

To those who think our first duty to old buildings is to preserve, and not to destroy them, it is a matter of indifference which design is best. Compared in value with the ancient work, which is destroyed, both are worthless; Mr. Scott's so far better that it preserved the old window.

And, as to their value as architecture, I venture to assert, and I know many whose opinions are of value agree with me, that the old front is better than either, it its simple dignity and venerableness as compared with their fussiness and strong for effect. The west front was stable if it had been let alone. It is stated now, as if it were a discovery, that "the new high-pitched roof requires a gable at the west end to close it in," and "the present west front," says the notice, "is quite incapable of carrying one without complete reconstruction." The new high roof necessitates a new gable, and the new gable necessitates the destruction of the old west front.

Sir Edmund Beckett abuses the old window, and challenges comparison between it and his own. I accept the challenge. The old window is of a piece with the beautiful Perpendicular work of the interior. The aim of the design is not to make pretty figures in stonework, but to form a frame for ranges of figures in stained-glass, and it is perfectly fitted for the purpose. The balance of solid and light is admirably preserved. The pictures are gone, but the frame is full of good and refined design, and I venture to say that it shows more architectural skill and knowledge, than Sir Edmund Beckett's window. The sill of his window is curved, a form which the taste of Mediæval builders prevented them from adopting. His openings are out of proportion; his window has three Catherine-wheels, the openings of the central one, which should be principal, being less than half the size of the side ones, and swamped by the cusped circles which surround it. At parts, the mass of stone is wider than the width of the lights. The designer, in making nine narrow lights, as in the old window, has forgotten how the refinement of the Perpendicular architects enabled them to reduce in proportion the masses of stone in the tracery. But the strangest feature in the window is the bottom part of the great circle, projected in plane beyond the tracery

under it, and hanging unsupported from two points, like a swag in debased Classic—liker, indeed, a sausage. It looks as if the author had not known what to do with the portion of the window under the swag; as if it had been left on his hands after the rest of the tracery had been designed. The tracery of these central lights is very curious. It has a Strawberry-hill-Gothic look, and instead of mitring as it ought, one part goes behind the other, like basketwork. That is to say, it shows ignorance of common principles which a very little ordinary training would have rendered impossible, while the want of technical knowledge is not, in this instance, as I have shown, compensated for by sense of proportion or beauty of design. This is a mistake characteristic of amateur work. Yet this designer, because he pays money, is allowed to do what he likes with the historical monuments of the country.

Sir Edmund Beckett's views are at least logical, and they have old authority on their side. Like the Mediæval architects, he does not hesitate to destroy old work, as in this case, because, like them, he believes he can replace it with better designs of his own. But he is almost singular in these views. This opinion of the merit of their own designs, as compared with older ones, is not generally held by modern artists or thinkers. Restorers profess to try to keep the old designs, even if for some reasons they are compelled to substitute new work of their own. It is those who are most original in producing new work who have the greatest veneration for the o'd. Many instances of this might be given, did time permit.

If there be truth in the views I have been stating, or even in the common views of restoration, one who holds Sir Edmund Beckett's opinions is not a proper custodian of our ancient buildings. Paying money to alter them ought not to give claim to the custody of national monuments. They contain the history of the nation. They are the national property. But the ample terms of the faculty he has obtained seem to justify Sir Edmund Beckett in talking of St. Alban's as he does, as if it were his own property. Yet it seems a recognised principle with the Chancellor's courts, that if anyone will pay the money, he may do what he likes with our historical buildings.

This principle was followed in the restoration of St. Patrick's Cathedral, Dublin. As Sir Benjamin Guinness expended a large sum on it he was, like Sir Edmund Beckett, allowed to be his own architect. He has destroyed the beauty of the church. Mean new stalls replace the old carved oak ones of the Knights of St. Patrick, which it is questionable if the money he expended justified him in appropriating.

The restoration of the other cathedral which Dublin possesses was undertaken by Mr. Roe, a wealthy distiller, who more modestly and wisely intrusted the work to Mr. Street. A noble church is the result, practically a new one; but comparing the two cases we must admit that Irish whisky has done more for ecclesiastical art than Dublin stout.

The treatment of the Cathedrals of St. Patrick and St. Alban's by the two wealthly baronets, who have amused themselves as their architects, is not unusual, nor are the principles of restoration which Sir Edmuad Beckett proclaims those commonly held by the profession [of which in this instance he proclaims himself a member]. But those principles have the merit of being logically consistent, and they have the sanction of all the great periods of architecture. Like the old architects, Sir Edmund Beckett considers his own work better than the old, and that in destroying the Perpendicular window, and replacing it by his own, he is doing a service to art. Architects are usually more modest. They claim only to remove excrescences and alterations of later times, and either to bring the building back to the condition in which its architects left it, or to complete and carry out their unfinished design. They regard the old as of historical value, and, even if they believed they could do better, do not think themselves entitled to attempt it. But this view is not logically consistent and practical, like Sir Edmund Beckett's. It acknowledges that old buildings are valuable as historical records, and, therefore, they reproduce them from their own conjecture and imagination. This is absurd. A manufactured historical document of a later age than the time it professes to belong to is worse than useless: it is misleading. It falsifies history. The only thing to do with an historical document is to leave it alone, taking all care to preserve it. If, like most old buildings, it be a document not of one age, but containing the work of successive periods, we must preserve them all. It may be imperfect, but we lessen its value and destroy it as a document by attempting to complete it from our own conjectures. It would be absurd to finish the carved mouldings of structures which the Greeks left uncarved. An old building may have later additions; but to remove these is to destroy records of the time to which they belong, while to substitute new work for them, especially if it is so well done as to be indistinguishable from the old work remaining, makes old and new alike valueless as a record. Yet this has been a common practice. It is due to the same habit of mind, which in history made historians supply proper speeches for their heroes, and imaginary reports of the House of Commons like Dr. Johnson's. The absurdity of the practice in literature is now apparent. Carlyle, by his reverence for absolute authenticity, finally finished it. But architecture, as we have seen, lags behind in modern thought, and the confusion of ideas which it springs from still prevails in restoration. Because a building is of, say, the 13th century, and, therefore interesting, restorers turn it into a new building. They talk of their work as 13th-century work, perfectly unconscious that it is, and can only be, 19th-century work. At best it is only a copy, and no one seeing it can tell whether it is an accurate copy or the product of the restorer's imagination, and thus its value as an historical record is destroyed. Till lately such deception was impossible. Old work is sufficiently understood to make accurate reproduction of it. Now a restoration is like a forgery of an old writing, in which the character of the old letters is imitated so accurately as to prevent detection. If a building is an historical record, treat it as such, and do not alter it or falsify it. I do not forget that buildings are sometimes more than historical records; they have value besides for their beauty as works of art, and for their practical uses, which in dealing with them an architect must take into account. As to their beauty, it is a question whether it is not better preserved by leaving them alone than by restoration as commonly carried out. I certainly think so, and I know many painters agree with me. As to their use, it is right to keep an old building in use: it is the surest way of preserving it. It is to their being turned to some use, seldom that for which they were built, that we owe the preservation of almost every ancient building we possess. If not used, they fall into ruin from neglect, or disappear as stone quarries. Not the Goths or Vandals destroyed the great buildings of Rome, but the Romans themselves, when, from the decay of the city, they had ceased to be used. The Emperor Majorian in the 5th century, "a great and heroic character, such as sometimes arises in a degenerate age to vindicate the honour of the human species" (Gibbon, vi., 166), attempted to stop the destruction by a fine of two thousand pounds sterling on every magistrate allowing it, and amputation of both hands and a whipping on their officers.

(*To be continued.*)

MR. H. H. STATHAM ON ORNAMENT.—II.

On Thursday, the 24th ult., Mr. Statham delivered a second lecture on "Ornament, Historically and Critically Considered," at the Royal Institution. A numerous display of illustrations, enlarged by the lecturer from actual examples, or lent by the Science and Art Department, South Kensington, was hung upon a screen. Egyptian ornament, the lecturer remarked, was at its best cumbrous and clumsy in its conception. It usually consisted of very simple elementary lines and curves, combined and rearranged in bands of decoration: zigzags, abrupt curves, and pointed figures being the commonest forms. The petals of certain compound flowers, greatly conventionalised and stiffened, occurred very frequently. These decorations were chiefly painted, and as might be seen from an examination of the mummy-cases in the British Museum, were almost restricted in choice of colours to the primaries and green—vivid hues which needed to be seen in the brilliant Egyptian sunlight to make them appear harmonious. The examples given in Owen Jones's "Grammar of Ornament" were not very exact as to colour, he had found by comparison with the actual specimens from which they were drawn, nor were the outlines strictly followed, being generally too precise in the reproduction. The lecturer referred in detail to some illustrations, showing how the suggestions, albeit heavy and executed with little grace, were to be found of the Greek key pattern, and also of the spiralised forms that play such an important part in Indian and Arabesque ornamentation. The forms of ornament, and especially the representations of nature, were materially influenced by the building materials in common use in Egypt—sun-baked bricks and intractable granite, and to the use of the latter stone for columns the peculiarly stiff treatment of the bell-caps was probably due. Their employment of mouldings was notably clumsy, but their chairs show, as a rule, good constructional outlines. It was a difficult question how far an Egyptian artist regarded his representations of natural objects as conventionalised. The author was inclined to suppose that the artist intended his paintings of lotuses, birds, &c., to be regarded as actual paintings of still-life, but that he was hampered by imaginary requirements of art. It was pleasant to pass from these examples to consider Greek ornament, the most logical, the most refined and thoughtful, the world had ever seen. Having shown the more common Greek decorative forms, the key or fret, the fillet and bead, the wave, the "honeysuckle," and the "acanthus leaf," the lecturer pointed out that the names by which we distinguish these designs were unknown to the Greeks, and we had no authority for supposing these were the flowers or forms intended to be represented. Indeed, he believed that they were not directly derived from any given form, but that they were abstract expressions of grace and beauty in elementary lines, repeated with such regard for symmetry as to produce pleasing effects. The ideas were not, strictly speaking, original; many of the patterns could be formed in ruder or less refined expression on the work of Assyrians, Egyptians, Persians, and other nations with whom the Greeks were brought into contact. But the treatment was marked by a new delicacy and refinement, and the subtle curves of the parabola and hyperbola were introduced into the smallest details. Greek artists were by no means pedants as to symmetry, and examination would show that while the main outlines of a design were repeated on opposite sides of a central line, the minor curves and lines were considerably varied without destroying the relative balance of parts. Many of the free forms appeared due to the use of the brush for drawing, and the so-called honeysuckle pattern was evidently one of these—a point which Mr. Statham practically illustrated with a few strokes of a brush filled with colour. It was quite possible that a skilful artist might evolve the "acanthus" leaf from his conception of a vigorous leaf-growth, but the question of the origin of this decoration would never be clearly settled. There were no rude angles in their work, and all curves sprang from tangents of other lines or curves. Still, their work was not uniformly perfect, and a drawing of a vase was shown in which the artist had neglected to occupy his whole field equally, and had, moreover, neglected to emphasise the position of the handles—an error not very uncommon in Greek vases. A series of comparisons with the works of neighbouring nations was given, showing that the volute of Ionic capital was probably derived from Persian architecture, and that other features were similarly adaptations. An extraordinary coincidence could be seen in the British Museum, and was illustrated. He had drawn a Greek vase, having upon it single bands of ornament at the neck, rim, and base, and in the centre of body a procession of warriors. In the "savage" room of the Museum, only a short distance off, he was struck by seeing a vase from the Peluian Islands, in which there were similar bands of ornament, and on the body a very rudely-executed procession of warriors carrying weapons and heads of enemies, while the ornaments on the bases of both vases were identical in conception. It would be interesting to know if there could be any connection between the two, or if the resemblance was a mere concurrence of ideas. Having shown illustrations of Greek dress patterns as we

knew them from paintings on vases, Mr. Statham remarked that the influence of Greek design had been felt from their days to the present throughout the civilised world, and Romans, Byzantines, and Gothic and Renaissance designers were largely indebted, directly or indirectly, to its refining effect. He must next refer to Roman ornament, between which and the work they had just examined there was an immense and striking difference, due to a want of thought in designing and reticence in execution. Where a Greek artist would merely paint a decoration on a moulding, the Roman would carve it. The Roman artist was indeed so profuse with his carving that he would leave no free space to rest the eye: his curves were abruptly made and broken, and the foliage was often massed into cabbage-like forms. Pompeiian ornament was derived from Roman, and was marked by special features and faults of its own. It was a singular instance of a rediscovery that at the Renaissance decorators adopted ideas from old Roman works in a manner so nearly resembling that of Pompeiian artists that we were apt to forget that the ruins of Pompeii were not excavated till long after the period of the Renaissance. In his concluding remarks the author described the archaic stiffness and use of serpentine form as characteristic of the Byzantine style, and added that he should deal in detail in his next lecture with this and the Celtic and Oriental types of ornament.

JAPANESE DECORATIVE ART.

LAST week a a paper was read by Mr. J. W. Tonks, at the Queen's College, Birmingham, before the members of the Architectural Association, on the above subject. The lecturer said that this age was remarkable for the rapidity with which a new discovery spread abroad. Like the Arabian genius of the bottle, Japanese art, once freed by British cannon from its restricted national scope, had in less than twenty years spread over the greater part of the earth. So remarkable a phenomenon deserved inquiry to ascertain whether it was like a past rage for "Old Dresden" or a present one for "Blue China," destined to leave little trace behind, or whether it was a genuine revival of distinct art features. While watching its growth and development, noting the changes it underwent in course of translation into the art-language of nations adopting it, the just weighing of its art-value was a more important matter. The furniture and decoration of rooms had already been influenced by Japanese taste. Architects had begun to design interiors in that style for English houses, and it had became a serious question whether an art owing its origin to an exclusive Eastern people might not extensively prevail. Japanese art had actually been known to Europeans for 300 years. The Jesuits, under Xavier, brought fine specimens to Portugal, and the Dutch carried wares of Hozen, Satsuma, and other places to Holland. There were fine examples of such old date at Hampton Court, and there was a still finer collection at Dresden. Yet though known thus early and prized highly the general awaking of Europe to the character and beauty of Japanese art was not twenty years old. It dated from the International Exhibition of 1862. These exhibits, first described by Mr. John Leighton, F.S.A., created a profound sensation. They were bought up immediately, and led to the still more remarkable display at Paris in 1867. These specimens, scattered far and wide, had an instant influence. What that influence had done our paper-hangings, furniture, and art objects proved. Lambeth and South Kensington were knowingly or unknowingly imbued with the foreign feeling, and the lecturer had heard of an eminent firm in London who, for nearly twenty years, had made their best successes by obtaining at high prices series of Japanese decorative designs. Although, according to Sir H. Thompson, the art of Japan came originally from China, the islanders had made it their own by their originality of treatment. This art, however truly such, was chiefly decorative. Sir E. J. Reed, M.P., in his remarkable account of his recent visit, could not admire their slight, ill-arranged dwellings, on which the winds had full play; and, allowing for all insular prejudice, a slight study would show that they would in no way suit our island. To come to decoration of surfaces, there was a crude element. The placing of panels or fan-shapes at eccentric intervals, without support or reason, was not to be justified on true art principles, however effective as a trick. The manner in which the Japanese varied set patterns in a border, avoiding symmetry and repetition, yet maintaining harmony of form and colour, was an important matter for study. Imitations or adaptations of these features by Europeans had generally failed through lack of this pervading harmony. The next point where Japanese art was worthy of study was in the relief it afforded to the eye by frequent divisions of plain surface or diapered surface, upon which the chief elements of the design were brought into due effect. In this it surpassed the Hindu and came near to the traditions of Greek art. But it was in the exquisite sense of the beauty of form and colour in the objects of Nature that the Japanese chiefly excelled. This gave a new sensation in art. Europeans had displayed flowers and plants in decoration twisted into scrolls and curves, or worked into diapers, like School-of-Art competition wall-papers. But the Japanese artist drew the branch or plant in the actual order of its being, trusting to his artistic power of combination to make it satisfy the eye. His success had been proved by the host of imitators he had found. His first strength was in his graphic fidelity to nature, his second in his mastery of the art of grouping. His fidelity and mastery of drawing, however, gave the Japanese at last a freedom quite surprising. A few touches would give a mountain, extinct crater at top, with tables of mist surrounding it—a river meandering through a plain, the motion and repose of water, the murmur of the brook, and the roll of the ocean. The Japanese treatment of birds and animals was remarkable for vitality and action. A border of a large salver in possession of Messrs. Elkington, consisting entirely of flying storks, was cited as an instance; and a symbolic contesting dragon and eagle in centre of same was graphically described, while it was pointed out that all this was still decoration, not painting, no shade being given, and all having a flatness of treatment suitable for that class of art. It was shown that this art resulted from intense and loving study of the objects depicted by even the commonest workmen who took part in the labour; and the lesson of the necessity for a more thorough art education in England was illustrated and enforced. The Japanese chose the plants, flowers, insects, birds, and animals around him for his ornament, and hence in his hands even the flight of a flock of geese became beautified. Finally, Japanese art was largely symbolic, depicting its religious myths, national events, literature, and poetry. The greatest blunder for Europeans, therefore, would be to copy it. We did not want pagan symbols, Japanese history, or Eastern literature. What we did want was the art principles which made its decoration so attractive. We required freedom from mere repetition, yet obedience to the finest laws of harmony. We wanted variety and repose in decoration, the genuine drawing of plants and flowers, the mastery and living display of animal forms in ornament. Lastly, we should employ the forms all around us, learn to use such forms as symbols truly and nobly, and then the study, not the slavish copying of Japanese, would lead us to a great decorative art.—The lecture was illustrated by a number of specimens, many of them of great value.

A NEW SYSTEM OF WARMING AND VENTILATION.

OUR readers know the ordinary system of heating by coils in which the hot water is made to circulate in horizontal tubes. Messrs. J. Weeks and Co., horticultural builders, of King's-road, Chelsea, have just introduced a great improvement upon this system, which combines the advantages of the ordinary coil with a fresh warm air diffusion. We have seen the new apparatus, the "hydro-caloric" coil, in operation, and have tested its capabilities, and we believe that Messrs. Weeks's invention will completely revolutionise the old plan of heating, and in a manner that will approve itself to the most exacting of sanitarian critics. The new hydro-caloric coil can be fixed in connection with an ordinary hot-water apparatus or hot-water system, to any building, and its appearance is certainly in its favour, and will meet the objection of many architects who have a strong aversion to the concealment of a hot-water coil by ornamental cases. Messrs. Weeks, with a knowledge of the natural laws of heat and gases, have placed their hot-water pipes vertically, instead of horizontally, and through the centre of each tube, an inch air-pipe of wrought-iron passes, open at both ends. These inner and concentric pipes communicate at their lower end with a horizontal air-chamber, to which fresh cold air is admitted by an ordinary pipe or channel from the outside. The air, in passing through the inner tubes, necessarily becomes warmed by contact with the heated surface of the outer water-pipes, and ascends with a greater or less velocity according to the temperature. The upper ends of the air-tubes are left open, and terminate in a chamber or trough, which may be filled with water to moisten the atmosphere, or with cotton-wool, or other medium, to screen off all impure particles. This upper air-chamber is covered by an open grating, through which the warm air rises and diffuses itself in pleasant breath-like currents through the room.

One undoubted advantage in the hydro-caloric coil is its economy. Besides the heat given out by the coil or outer pipes by radiation, which, of course, is in proportion to the surface of the pipes heated, additional warmth is diffused by the fresh warmed air passing through the tubes; and a double heating surface is obtained, a gain of one-third more heat being claimed over the common coil of horizontal pipes. The supply of air can be regulated, and flaps are fixed to the lower air-chamber of coil, by opening which the air of the apartment may be utilised, and the outer supply shut off. By actual and careful experiment, we found an ordinary coil of this construction containing about 40 tubes, discharged into the room 30 cubic feet of fresh warm air per minute at a temperature of 115°, the water in the coil being at a temperature of 140°. The external air was 50°. The upward current of air through the tubes, measured by the anemometer, showed a current of 45 cubic feet of air in 5 minutes, and a piece of tissue paper placed over the tubes would be instantly raised by the current of air. The apparatus might be advantageously used to warm and ventilate not only halls and public rooms, but hospitals, greenhouses, vineries, &c. The air introduced may be readily fumigated by carbolic acid, or any other disinfectant placed at the outer inlet, and we found the fumes of some ammonia in less than 10 seconds after it had been applied to the channel, at a distance of about 10ft. from the coil. By the adoption of this apparatus, fumes may be conveyed into conservatories, and the atmospheres of hospital-wards be easily disinfected; the coil can be made to give out the required quantity of fresh warm air for any apartment by the addition or reduction in the number of the tubes. It can be fixed under the floor if required; but its present construction is so far more sightly than the original form, that it may be made to harmonise with the dadoes of apartments. The vertical position of the tubes is more architectonic in character, and admirably admits of ornamentation or colour to suit the tone of the walls. The hydro-caloric coil can be made in circular as well as in the usual oblong shapes, and it can, in fact, be made to suit any purpose for which heating is required. We understand Dr. Townsend, of Queen's Gate, and other eminent physicians have expressed their approval of the coil, and are about to use it for heating and disinfecting operating-rooms. Its great simplicity and cheapness are important points in its favour, and as it combines the advantages of admitting and warming the air at the same time, it cannot fail to supersede the ordinary systems of ventilation and warming.

SANITATION AS AN INCREMENT IN VALUE OF HOUSE PROPERTY.

AT the last meeting of the Institution of Surveyors, the paper on this subject, read by Mr. H. H. Collins at the previous meeting, was discussed. Mr. W. White, F.S.A., expressed the opinion that very little increase in value had resulted from what had yet been done in the way of sanitation, and that because people in general did not see the necessity for good construction on sound principles. He considered that a tenant ought to be able to demand from the landlord some certificate that the drains were disconnected from the sewers, and that there was a separate supply for drinking pur-

poses, and he suggested that a short Act might be passed, declaring that an action for recovery of rent should not lie unless it could be proved that the sanitary conditions were not unwholesome. Mr. J. W. Leeds showed the fallacy of the prevalent fears of "overcrowding." He differed from Mr. Collins in his idea of placing w.c.'s, sinks, &c., near the external walls, because the currents of air were then more frequently into the house than out of it. Mr. T. Chatfeild Clarke looked with suspicion on quasi-philanthropic associations which took payment for their services. This question should not be the subject for clap-trap discussion, nor made the property of specialists, but be treated as falling within the lines of an architect's daily practice. The last speaker had overlooked the fact that if the closets, &c., were grouped in centre of house, the drains must be carried beneath the floors, and would be a possible cause of danger. Mr. Rogers Field defended the new Sanitary Protection Association, and gave particulars of a recent case, in which, by examining the plans of a partially-built semi-detached villa, he had been able to recommend alterations which were carried out at an extra cost of £18, but which would have cost from £70 to £80 as alterations if the work had been completed. Prof. Kerr and Mr. W. H. Warner having spoken, Mr. C. N. Cresswell said he thought it had been hardly necessary, in this year of grace, for Mr. Collins to come down to that Institution and demonstrate that proper sanitary equipments for houses increased their value; the proposition was self-evident. The laws of sanitary requirement were fixed and definite; but what remained to be done was not only to be make the public understand these principles, but to induce them to apply them. Having argued against legislating in advance of public opinion as an unwise attempt to move an organism by its tail, Mr. Cresswell suggested that it would be possible to draft a general Building Act, whereby certain regulations could be laid down and established by law, each particular local authority applying and, if they pleased, amplifying them, but never curtailing them. He also mentioned a suggestion he originally proposed some years since, that the local authority should grant a graduated certificate, on the principle of Lloyds' classification of ships, as to the sanitary condition of a house. The discussion, on the motion of Mr. E. C. Robins, was adjourned till Monday next.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

An ordinary meeting of the Institute was held on Monday evening, the President, Mr. J. Whichcord, F.S.A., in the chair. The Secretary read a list of nominations for membership, comprising nine of proposed Fellows, 73 Associates, and one Hon. Associate. Among the new members admitted was Mr. W. Q. Orchardson, R.A.

HISTORICAL DOCUMENTS.

Mr. J. J. Stevenson read a paper under this title on the Restoration Controversy, which will be found on p. 354. At its close Mr. Stevenson explained that he had deemed it only right to send Sir Edmund Beckett, Q.C., some extracts from that portion relating to the new west front of St. Alban's Abbey, and to ask if he would wish to come down and answer the criticism. Sir E. Beckett had written to the Institute in reply.

Sir E. Beckett's letter was then read by the Secretary, and caused great amusement, the more salient passages being greeted with outbursts of laughter and ironical applause:—

I cannot, as I told you, go out to hear Mr. Stevenson's paper this evening even if I wished, and having read the extracts which you have sent me, I cannot say I do wish to hear more of it. It seems to me a very feeble repetition of the same kind of opinions and statements—it would be absurd to call them arguments—which were refuted and exposed by Sir Gilbert Scott, Mr. Street, and others in 1877, in a manner which would have satisfied most men for more than four years. He has certainly been more discreet this time, so far as I can judge from the extracts, in avoiding all reflections on any specific restorations except one, in which he could make sure of more sympathy at the R.I.B.A. than he got last time. Another proof of his possessing the better part of valour is his silence about the contests in which his Anti-Restoration Society have been engaged since 1877, at Southwell and Carlisle, and, I may add, St. Alban's, with their usual success. But vague generalities and platitudes on such a subject can do no good. It might be of some use to warn mankind against employing dangerous restorers who have committed certain specified atrocities; but I cannot imagine what good Mr. Stevenson flatters himself he is going to do by warning mankind against *the* only person whom he specifically attacks now, inasmuch as he is certain not to be employed by anybody in the way, and you have already learned how gratuitous advice is received by the courts which have to determine such matters, if they are disputed. However, it is difficult to fathom the depth of some men's confidence in their own powers. Mr. Stevenson perhaps imagines himself to be the coming man of the Anti-Restorationists, whom the world has been waiting for to change the destiny of the west front of St. Alban's, and either to convert or frighten me into letting it fall down, as it very soon will if let alone, or else into rebuilding it according to the dictation of somebody else. He may persuade himself, too, that the time is at hand when the decision of these things is to be taken out of the hands of the proper legal and ecclesiastical authorities, together with those who pay for the work, and handed over to those who have nothing to do with it, which must be accompanied with a power of taxing somebody to provide the funds; and that it is our duty to convince a set of meddling strangers, and not them to convince us, who have the work to do, which they certainly will not by making statements about facts which we know to be wrong, and expressing opinions which we have no reason to consider worth a farthing, but very much the contrary, seeing the absurdities with which they are accompanied. Further, the same people advocate letting buildings fall down, retaining deal pews and plaster screens, and anything else—we know what their opinions about the "anything else" is worth, even if it does not admit of absolute refutation. I shall appear ungrateful for the compliments he (Mr. Stevenson) pays me in saying that "my views are at least logical, and have old authority on their side, and that I am like the Mediæval builders;" but I cannot help it, any more than I can return them or pronounce his views either logical or Mediæval, or anything but irrational and absurd. Moreover, it appears, that however logical and supported by authority my views may be, my practice is heretical and dreadful. "Sir Edmund Beckett does not hesitate to destroy old work, because he believes he can replace it with better designs of his own." There is a sense in which that is true, and another in which it is false, as is usual in many ingenious libels and mis-statements; the public are intended to take it in one sense, and the author will defend it in the other as soon as he is taken by the throat and made to say what he means. If "old work" means comparatively modern brick walls, with the old ornamental stones tumbled in as rubble, parapets of the churchwarden style, lime-washed daubs of sham panels on rotten thin boards of the last century, roof-timbers which your oldest member condemned as unfit to stay fifty years ago, and which would probably have all fallen together with their attached irons in the snow of the last two winters, and perhaps brought down the whole clerestory, and more with them—then undoubtedly he is right, and may make the most he can of it. But if he really knows anything of what he writes about (which I doubt, from certain internal indications), he knows that not a single bit of genuine Gothic work, or work of any architectural pretension at all of any date, either in wood or stone, has been destroyed at St. Alban's since I have had anything to do with it, if it was capable of standing safely any longer. Of course ignorant people can pronounce anything capable of standing because they see it stand yet; and then others, who are not quite so ignorant, but something worse, avail themselves of such statements by saying that "the ruinous state of (whatever it may be) is denied by others," and so avoid pledging any reputation of their own or of anybody else to the denial, and yet take the benefit of it: a mode of controversy which is thoroughly contemptible, but too common in other matters as in this. The fact is that the west front of St. Alban's ceased to exist as architecture, except the central part, and became brick walls long ago; and now the central part also is simply dead of old age, bad construction, and worse building, and stone entirely unfit for external use, and has only two alternatives—to fall down, or to be rebuilt before it falls. Fortunately, enough remains of the inside of the porches to enable them to be, in the common sense of the word, restored, *i.e.*, retaining some of the old stones together with some new ones copying the old. Many of the external arch stones of the central porch have also been found, used as rubble in the modern walls; that being so, the only question is the mode of rebuilding the west front, except the porches, and that has nothing at all to do with the present subject of "Historical *Documents*," as Mr. Stevenson absurdly calls it, as if any good were to be done by using common words in a sense in which no man understands them. It can never be a historical *monument* (to speak English and not nonsense) again. Even if anyone proposed to copy it, there is absolutely no architecture to copy, except that vile Perpendicular window, about the ugliest in England. Bad as it is, I contemplated letting it alone if it would have stood being let alone; but it would not, and I will certainly not spend sixpence in rebuilding or copying such a thing, which is the real meaning of "restoring" it, in its present condition; nor would I let anybody else, if there were anyone so foolish as to offer it, spoil the whole design by sticking in such a window as that, which never had any business there at all, and belongs to the period when the depravity of the monks of St. Alban's had become the scandal of all England. Nearly all the original windows in the church, except some of the clerestory lancets, are Decorated, and therefore so are the seven new ones which I have inserted already in the formerly dark bays of the aisles, which everybody can see are an immense improvement to the church. I am quite disappointed to see nothing in the extracts, but you will doubtless have the defect supplied, of the criticism of which Mr. Stevenson gave me notice in his letter, inviting me to come and make sport for the Philistines this evening, "on the inferiority of the new west window to the present one, both in design and proportions." Design, being a matter of taste, will be very easy for him to dispose of, and I am very glad to find that such a critic as Mr. Stevenson does disapprove of it. I should be more alarmed than I have been at anything I have heard of it if he did not. And I am too much used to such criticism of designs which end in being generally admired, and sometimes even copied, when they are done, to pay much attention to it, especially after the many opinions I have already received in favour of this design, and some letters begging that I will not alter it, which perhaps some persons may think superfluous. But when he talks of the inferiority of the new proportions to the old ones he is evidently drawing a bow at a venture, and taking for granted that, with my usual audacity, I have altered them for nothing but my own fancy. And yet he could very easily have ascertained, as the drawings are published, that the outlines of the new and old windows are identical, as well as the number of the lights, except what is due to the arched sill, which is necessary for any sound construction there, as the present window actually stands on the thin vaulting of the porch; or else we must have had a window of really different, and perhaps worse, proportions. So the moment he gets out of the safe regions of opinions which admit of neither proof nor refutation, into the dangerous realms of facts and measurements, not a word he utters is correct, at least, about the restoration of St. Alban's, which alone I am concerned to notice. It is really what they call breaking flies upon the wheel, instead of blowing them away, to criticise the platitudes and paradoxes of which the extracts, at any rate, are composed, apart from these special blunders about St. Alban's, which were obviously meant to be the plums of this very heavy pudding. Still, a specimen or two are irresistible; for here is the very latest nostrum of the Anti-Restorationists for keeping up old buildings:—"It is right to keep an old building in use: it is the surest way of preserving it. . . . If not used they fall into ruin." That, then, is the true way to restore churches that are on the point of falling; go on boldly using them. Never mind if people tell you they are dangerous. Probably they know nothing about it; at any rate, "some people deny it." If a congregation is buried in the ruins, what can be a more glorious and beautiful end? If cracks are heard and seen, and stones begin to fall occasionally by way of warning, why then perhaps you must give it up and wait serenely for its fall, as they did at Chichester when they found the tower hopeless. The ruin will still be very interesting to artists, who, Mr. Stevenson assures us, specially agreed with him, and I daresay they do. But though use is the thing to keep buildings in repair, we must have no restoration for such a base object as use. "Unless we act like barbarians . . . . we must leave it unused, if its use involves alterations which injure its historical value," as of course every restoration and every new stone put in for repair *pro tanto* does. To people of this order of mind and understanding, Southwell is as Stonehenge and St. Alban's as Avebury or a Cæsar's camp. . . . . .

At the conclusion of the letter, Mr. Horace Jones exclaimed: Surely you are not going to print this?

The President: No, not in full. I think, gentlemen, Mr. Stevenson's paper we have heard read, and the mild letter from Sir Edmund Beckett will lead some member to open the discussion.

Mr. William White, F.S.A., remarked that he did not object to the general principles nor to the practice of conservation, but he could not admit the reality of the exaggerated ideas of some conservationists as to what was possible and what impossible in dealing with old work. In one point he agreed with Sir E. Beckett in objecting to what he understood Mr. Stevenson to say—namely, that it would be better to allow a building to become useless than to repair it, if by touching it we altered its historical character. If he rightly understood Mr. Stevenson, he thought he had expressed himself in a perfectly illogical manner, and in a way which did not meet the views of most members. If a building were left unused it would very soon be swept away; it was the continuous adaptation to the requirements of the times that had preserved to us the great mass of our English cathedrals and churches. He would not deny that there had been a lamentable want of care in restoration. He must for himself confess that in some of his own early works he was not as scrupulous as he should have been. But he had suffered for that, for he had often had the credit of destructive work, which he had refused to do, but which had been subsequently done by the vicar or churchwardens. He must controvert the assertion by Sir E. Beckett that design was "a mere matter of taste." Design was capable of analysis, and the exercise of reason in almost every particular, although there was a spirit in design which it was impossible either to argue upon or define, and this expression depended on the much misused and much abused qualities of sentiment and poetry. The more careful preservation of our historical monuments was due, in large part, to the writings of Sir Walter Scott. Sir E. Beckett had stated that he had touched nothing at St. Alban's Abbey except the west front, but he could not help thinking that he had something to do with other work done at the Abbey, and especially the destruction of the south corbel table. However that might be, he hoped Mr. Stevenson's suggestion would be adopted, namely, to make the Institute's Committee for the Preservation of Ancient Monuments more practical.

Mr. Ewan Christian agreed with Sir E. Beckett in thinking that Mr. Stevenson's paper was pretty completely answered on the last

occasion, when he adduced very similar arguments. He had as great a reverence for the past as Mr. Stevenson, but he believed that the pew system had been a most murderous thing for the influence of the Church of England, and could not, therefore, admit that pews should be retained. A most righteous work had been done in clearing out these exclusive boxes. He would ask the lecturer where he drew the line between what was historical evidence and what was mere modern interference with the fabric, because—[Mr. Stevenson: I draw it where you begin to falsify and copy]—if so, anything whatever existing in the church, whether it were the work of a churchwarden or village carpenter, must be undisturbed, because it illustrated some period of the history of the building. If the insertion were a real work of art, it ought, of course, to remain, but not otherwise. He concurred in the strictures which had been passed on the restoration carried out at St. Patrick's, Dublin; it rendered one perfectly miserable to walk through the Cathedral and behold the awful result. He also agreed with Mr. Stevenson that the architects were not the only persons worthy of blame in church restorations; the clergy and churchwarden were often responsible for much injury; he had himself groaned over their work. In restoring a church in Norfolk he found one of the earliest of the Jacobean Communion-rails, having the characteristic dog-moulding; he urged that it should be untouched, but in his absence the authorities took the rail down and burned it. As consulting architect he visited a Herefordshire church, where there was a genuine apse having Saxon work in it; against his advice this was destroyed to put in a large new window. He could tell them a good deal about the robberies committed on chancels by those who ought to preserve them—of the lead stripped off, sold, and replaced by tiles, of the mean fir poles substituted for sound timbers, and he often regretted that he could not make the fellows now in their graves come back and repay what they had taken away. As to Southwell Minster, he should like to know if Mr. Stevenson would have hesitated to replace the western spires taken down in 1801 for the sake of their lead. It had been said that the towers were too weak to leave them; but any one who had been on them, like himself, and had seen the solid 4ft. 6in. walling, would have known that this was incorrect. He had taken considerable pains to reconstruct them as they formerly appeared, and was guided by old illustrations, including an original drawing by Turner, executed shortly before the spires were removed, and last week he had the satisfaction of seeing the new ones in position.

Lieut-Colonel Lenox Prendergast, hon. associate, suggested that if it were generally known that a committee of the Institute would come forward with alacrity to examine into and advise on the proposed restoration of churches or old houses, many vicars, committees, and country gentlemen would gladly avail themselves of such opportunities, and much ancient work would be preserved. It was to be feared that much of Wren's work fell into the hands of restorers who, however they might understand the principles of Gothic work, had no sympathy with the Renaissance, or a thorough acquaintance with the Five Orders. He was glad to see in the recent restoration of St. Stephen's, Walbrook, that the old pews had been left, for the whole of the columns were stilted, and the design conceived in harmony with these.

Mr. Christian explained that the Institute appointed some years since a committee for the conservation of ancient monuments.

Mr. Hebb asked if that committee was still in existence, and did it ever sit?

Mr. Christian: Yes; whenever occasion for calling it together arose.

Mr. L. W. Ridge: Does the committee ever publish a report?

Mr. E. Woodthorpe: Or is it after the usual style of the Institute?

No reply was given to these inquiries, and Professor Kerr said it was to be regretted that Mr. Christian had dealt with the theological question of the pew-system, rather than with the broad issues raised by Mr. Stevenson. He (Mr. Kerr) was not one of those who lived in the past, and he was afraid Mr. Stevenson was, but he sympathised to a great extent in the view he had put forth—the need for a more universal recognition of the interest attaching to records of the past.

The President proposed a vote of thanks to Mr. Stevenson for his paper, which was carried with applause.

Mr. Stevenson, in replying, explained that he had simply invited Sir Edward Beckett's attention to certain features in the design for St. Alban's new west front, to which exception might, he thought, be taken; and he had said that the removal of the old west end was a reckless destruction of an ancient monument. It had not affected his criticism of the design that Sir Edmund was not an architect by profession. In a building of such a character as St. Alban's, they had a right to criticise any published design purposing to alter its features. In reply to the Secretary to the Institute, Mr. Stevenson explained that the drawing of the west front exhibited on the screen was enlarged, he believed with strict accuracy, to six times the size, from the design published in the Building News. He had simply referred to it as one of the grossest instances of ignorant interference with a valuable work of architecture. Although, personally, the reader of the paper was no one, he thought Sir Edmund Beckett might have honoured the Institute with his presence at its meeting. He agreed with Mr. Christian, that the locked-up pew system was objectionable; what he recommended was, instead of removing the pews, to take the doors off and leave them open. He had tried to show that, as historical documents, old buildings had an intrinsic value quite independent of their character as works of art. He hoped that this would, before long, be accepted as an elementary truth in the architectural mind. Notwithstanding what Sir Edmund had written, and Mr. Christian had said, there was a great difference in his paper of that night and the one read three years since. He had endeavoured to set out more broadly and more fully the great principles on which we should go in dealing with an old building, namely, the consideration of its historical interest.

THE CHANNEL TUNNEL.

CLOSE to the western entrance in the Abbot's Cliff, near Folkestone, are the Channel Tunnel works, now progressing under Colonel Beaumont, R.E. The project, both in design of plan and mode of execution, is practical and ingenious. The chalk strata of England and France are geologically continuous, and the dip of the beds is the same—namely, toward the east, on both sides of the English Channel. The lowermost portion, known as the "grey chalk," is of more clayey nature than the other portions of the chalk formation, and is sufficiently impervious to water to render perforation feasible. The plan proposed is to follow by a descending tunnel the natural dip of the grey chalk towards Dover, until a depth of 200ft. below the sea bed of the Channel is attained. The Channel Tunnel will then be driven horizontally right across from shore to shore. A similarly inclined tunnel on the French side, rising along the direction of the dip of the strata, will make communication again with the upper surface of the land. The grey chalk is thus entered and followed throughout along its natural position—from daylight on the one side, and in its subterranean and submarine depths to daylight on the other side of the Channel. The works at Abbot's Cliff consist of a short drift-way from the sea front of the "Warren" to the commencement of the trial tunnel, which is circular, 7ft. in diameter, and runs parallel with the existing line of the South-Eastern Railway. It has already attained a length of 300 yards. The chalk is drilled by a circular disc of iron cutters, worked by a compressed-air engine by means of a shaft with bevel-wheel gearing, the shaft and engine extending for a length of 30ft. The cutting disc makes two revolutions per minute, and is fed forward a $\frac{1}{4}$in. at each revolution. The total advance of the whole face of the boring is $\frac{1}{2}$in. per minute. The *debris* cut out by the revolving disc is received in a sort of large iron tray, which is hauled back every now and then by a chain worked by an auxiliary air engine; and the water which percolates the chalk is easily kept under by a small donkey pump. The promise of success so far seems good, but the 7-foot tunnel has not yet been driven much, if anything, below low-water tidal level, and we have yet to learn whether any powerful jets of water may get in through fissures as the subterranean depth is increased. Trial shafts have been driven vertically down a considerable distance both on the English and French shores, and there have been no signs of extraordinary difficulty from such sources. Nevertheless, the question of a possible fissure or deep crack in the continuity of the grey chalk itself in mid-channel, along a line passing between the "Varne" and the "Ridge," can only be actually settled when the Channel Tunnel itself solves it, and ends, once and for ever, all discussions upon the subject.

A NEW ANTISEPTIC APPARATUS.

THE Antiseptic Apparatus Manufacturing Company, of 27, Harrow-road, W., have lately patented an apparatus for deodorising and destroying the foul gases arising from closets, to which we draw the attention of our readers. The invention consists in a copper vessel filled with a specially-prepared deodorising solution of permanganate, and so shaped that it can be fitted closely to the container of the closet beneath the seat. From this vessel a small metal tube leads up to the rim of the basin, over which it turns, and by the movement of the lever which actuates the bowl, in combination with a small plug or piston working in a cylinder at one end of the vessel, the solution is forced through the small tube at every action of the handle, and a small portion of it mixes with the water in the basin sufficient to deodorise it. The water is turned pinkish by the mixture, and retains its brightness as long as the closet remains in a clean condition. We have inspected the apparatus, and do not think it can possibly get out of order, as the action is very simple, and a certain quantity of the fluid is taken into the cylinder and forced out at every fall of the handle. There is no connection with the water-lever of closet. The apparatus can be made to any size, to fit any closet, but the size kept in stock holds sufficient fluid to last a twelvemonth in ordinary cases. The cost of the apparatus is 36s., and the company are prepared to fit it to any public institution as well as private houses. For hotels, railway-stations, factories, and hospitals, we believe great advantage will be derived from its use as a disinfecting agent. Dr. W. B. Richardson and other scientific men have spoken in high terms of the patent, and its great recommendation is that it can be fitted to every construction of apparatus by any competent plumber.

CHIPS.

The foundation-stone of a new vicarage at Abbots Bickington was laid on Friday week. The building is being erected by Mr. R. H. Beckly, of Pancrasweek, from the designs and under the superintendence of Mr. S. Dobell, architect, of Exeter.

A Primitive Methodist chapel, seating 350 persons, was opened at Pilsley, Derbyshire, on Monday week. Mr. S. Godber, of Pilsley, was the architect, and Messrs. Rouse and Hall, of the same place, were the builders.

New Congregational Sunday-schools were opened at Over, Cheshire, on Tuesday week. Mr George Hamlet was the builder.

At a meeting held at Marshwood, near Bridport, last week, it was resolved to erect a new church in that district at a cost of £1,000. Mr. G. R. Crickmay, of Weymouth, is the architect.

The restoration of St. Peter Mancroft Church is progressing, from the designs of Mr. G. E. Street, R.A., but the committee find that it cannot be reopened at Whitsuntide, as originally proposed.

The first pile was driven by Lady Jarvis, on Tuesday week, of a new fish-landing wharf now being formed at Fisher-fleet, King's Lynn, as the first portion of the proposed new docks. Mr. Walker is the contractor.

A new lecture-hall, which has been added at the rear of St. Andrews' Presbyterian Church, Upper Norwood, was opened on Wednesday week. It is built of stock bricks, with red brick dressings, and measures 54ft. by 24ft., seating between 200 and 300 persons. Ten class-rooms can be formed by erecting a series of framed partitions. Beneath the hall are minister's rooms, ladies' room, and kitchen. Mr. Dunk, of Leadenhall-street, was the architect, and Messrs. Hollidge and Stuart, of South Norwood, were the builders; the cost has been £950.

St. James's Church, Halifax, was reopened on Wednesday week after having been restored, from the designs of Mr. W. S. Barber, architect, of that town. The chancel-paving has been executed by Messrs. Maw and Co., of Broseley, Salop.

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ILLUSTRATIONS.

THE PRINCESS'S THEATRE.—THE BEAUFORT THEATRE.—CHURCH OF ST. MATTHIAS, BRIXTON.—DESIGN FOR THE NEWBURY GRAMMAR-SCHOOL. — CLUB DESIGN FOR ALMS-HOUSES.

OUR LITHOGRAPHIC ILLUSTRATIONS.

ROYAL PRINCESS'S THEATRE.

This theatre, recently erected from the designs of Mr. C. J. Phipps, F.S.A., has a frontage towards Oxford-street of 21ft., and is built in Portland stone. Over the entrance is an open loggia 8ft. deep, forming a balcony overlooking the street. This is approached from the smoking-room and grand foyer on the level with the dress-circle corridor.

THE BEAUFORT THEATRE—FRONTAGE TOWARDS THE EMBANKMENT.

The illustration shows the frontage towards the Victoria-Embankment of the new theatre now being erected for Mr. R. D'Oyly Carte, from the designs of Mr. C. J. Phipps, F.S.A. The other approaches are in Beaufort-buildings, Strand; and as the theatre is isolated on all sides, there is great facility for entrance and exit. The materials used are red brick and Portland stone.

ST. MATTHIAS' CHURCH, UPPER TULSE-HILL, BRIXTON, S.W.

This church was won in open competition last year. The design which is now illustrated differs materially from the one submitted in competition, both with regard to the plan and also as regards cost. The walls of the church will be faced both externally and internally with red brick, with stone dressings to windows, arcades, &c.; the nave columns will be in red Mansfield stone. The chancel will be groined in brick with stone ribs; the other portion of the church will have open-timbered roofs. The architects are Messrs. Harnor and Waters, of No. 8, John-street, Adelphi, London.

DESIGN FOR GRAMMAR-SCHOOL AT NEWBURY.

The drawing which we illustrate this week was sent in competition for the Newbury Grammar-schools under the motto "Propria quæ maribus." It was proposed to build it of red bricks with terra-cotta dressings, and the roofs covered with Penmoyle sea-green slates. The architect is Mr. J. Martin Brooks, 35, Wellington-street, Strand.

"BUILDING NEWS" DESIGNING CLUB.—ROW OF ALMSHOUSES.

The week before last we published the selected design for a row of almshouses, and to-day we give the drawings of the second design, the author of which is "Nemo."

By the slipping of a scaffold at the new municipal buildings now in course of erection at Perth, a mason named Thomas Wallace was on Saturday thrown from a height of three stories and killed.

THE BUILDING EXHIBITION.

As our readers are aware, the Building Exhibition opens at the Agricultural Hall on Monday next, and will remain open till the 19th inclusive. This is the second year of the enterprise, and the promoters appear to have done everything in their power to render the forthcoming exhibition not only an improvement on the last, but a thoroughly representative exhibition of the various trades, arts, and processes connected with the great industry of building. Many new and revived processes allied with building and construction will be represented at the Agricultural Hall, and we find, from a glance at the well-compiled and bulky catalogue edited by Mr. John Black, the secretary and manager, many of our leading manufacturers connected with the building and engineering trades have entered the lists as exhibitors, and we may fairly look forward to examples and specimens of many recent manufactures and appliances The exhibition will be divided into rows distinguished by the letters of the alphabet placed at the end of each row, and the number of the stalls as noted in the catalogue, with the letters of the avenue will enable any visitor to find the stall of any exhibitor. A comprehensive classified index is given in the catalogue, giving the names of exhibitors in alphabetical order, with their respective rows and numbers of stands. It is unnecessary in this preliminary notice to give anything like a complete idea of the various branches represented; we find, however, among them several inventions and exhibits relating to smokeless grates and fuel, specimens of ancient and modern locks, various decorative appliances, building materials, constructive expedients of interest to the architect and engineer. Building stones are represented by stands of well known merchants, bricks and tiles by numerous manufacturers, cement and concrete, ironmongery and brass work, chimney-pieces, encaustic and other tiles, joinery, door furniture, gas-stoves and firegrates, horticultural building and appliances, hot-water apparatus, and a variety of wall and other decorations, together with numerous mechanical apparatus and labour-saving machines, are among the thousand exhibits which will find a place in the hall, many of which we shall notice in detail next week. Among the three hundred exhibitors we find the names of Messrs. G. and E. Ransome, Messrs. Doulton, Steven Brothers and Co., Messrs. Chubb and Son, H. and C. Davis and Co., Wilcock and Company, Ashton and Green, Jones and Willis, S. Trickett, Jeffrey and Son, Boyle and Son, W. Smeaton and Sons, Joseph Cliff and Sons, Drake and Co., W. H. Lascelles, the Papyrotile Company, the Antiseptic Apparatus Company. The catalogue is prefixed by a few readable articles. "A Sketch of the History of Decoration," by Mr. W. J. E. Crane, will be found a general introduction to the decorative exhibits. "Smoke and Fog Abatement and Smokeless Fuel" forms another useful introduction to the display of heat-producers and various appliances; after which are short dissertations on ancient and modern locks, by Elihu Burritt, M.A.; "Glass as Applied to Building and Decoration," by C. Evelyn Smith; "Our Timber Supply," "Distempering," &c. These introductory chapters have at least an educational value to the many hundreds of visitors who frequent the exhibition, and make the moderate-priced catalogue prepared by Mr. Black really a useful handbook; but another feature which we did justice to last year has been retained, namely, the blank space for visitor's notes on each page of the catalogue, which adds considerably to the permanent value of the volume, and will be found of service by all those who visit the exhibition for the purpose, not only of seeing, but recording their experiences. Mr. Black's sixpenny catalogue, in short, is suggestive of how these often uninteresting records may be turned to account.

OLD AND NEW CHURCHES OF LONDON.*

The work before us under this heading comprises a series of illustrations of the existing churches in London from the Norman period to the Great Fire, in addition to which are many of the examples from churches built from the year 1844 to the present time. The illustrations have been culled from a variety of sources, among them the Building News, and have been collected and arranged by Mr. Alfred Capes, architect, the introductory essay on the "Principles of Architectural Beauty" being written by the Rev. J. M. Capes, M.A. Among the illustrations of old churches given are views of St. Mary Overy, the Temple Church, Austin Friars, St. Ethelreda, Bow Church, Lambeth Palace Chapel and Crypt, St. Stephen's Chapel, Westminster, St. Stephen's, Walbrook, and St. Dunstan, Stepney. Of the new churches the list begins with the late Sir Gilbert Scott's early church, St. Giles, Camberwell, a fair illustration of which is given. The interior of All Saints', Margaret-street, by Mr. Butterfield; St. Columba's, Haggerston, by Mr. J. Brooks, reproduced from the Building News; St. Mary Abbott's, Kensington, St. Jude's, Kensal-green, by Mr. J. T. Lee; St. Augustine's, Kilburn, by Mr. J. L. Pearson, R.A.; St. James-the-Less, Westminster, by Mr. Street, R.A.; St. Saviour's, Oxford-street, by Mr. A. Blomfield; and St. John Baptist's, Kensington, by Mr. J. Brooks, are the best of these examples. Short descriptive notices are given of each. But the principal part of the book is devoted to the introductory essay by the Rev. Mr. Capes, in which the principles of beauty are discussed, though what exact bearing the subject has on the churches of London is not particularly clear. We cannot afford space to analyse Mr. Capes' theory, which in the main appears reasonable. He thinks in the adoption of some prominent unit and its repetition more or less, that the highest beauty is to be reached in architecture, and St. Mary Overy is pointed to as an example of the principle of adopting a unit of length. We think a little too much prominence is given to window tracery, as having exercised so great an influence on Pointed architecture. No doubt it was an important feature, but we cannot acknowledge that it was the brilliancy of 14th-century glass which altogether made the art. Two beautiful examples of windows are supplied in the illustrations—those at Austin Friars and of St. Ethelreda, in Ely-place, the former belonging to the latter part of the 14th century, and the latter belonging to the early part of that century. The illustration of the latter is a clever wood engraving, by H. W. Brewer. The remarks made by Mr. Capes on modern architecture are sensible, and his strictures on the "Queen Anne style," which is denied to have "any style at all, but an Anglicised continuation of the brick architecture, imported by William III.," are to the point.

* The Old and New Churches of London, &c.; collected and Arranged by Alfred Capes, Architect, with an Introductory Essay by the Rev. J. M. Capes, M.A. London: J. Bumpus, Oxford-street.

CHIPS.

The third annual dinner of the Builders' Clerks' Benevolent Institution will take place on Thursday next, at the Guildhall Tavern, Gresham-street, E.C. Mr. Stanley G. Bird, President, will take the chair.

A tender has been accepted at £4,241 for the erection of a church at Burham, near Rochester.

The Brighton board of guardians last week instructed their architect, Mr. Maynard, to prepare plans for an infirmary for 350 patients, and vagrant wards for 100 males and 40 females.

A new Primitive Methodist chapel was opened at Swanwick, Derbyshire, last week. It is Gothic in style, is built of Leicestershire stone, with bands of blue brick, and has cost £750 for erection. Mr. Wills, of Derby, was the architect; Messrs. Brown and Simkins, of Eastwood, were the builders; the heating is by hot-air on Truswell's principle.

The Great Yarmouth Race Committee adopted last week plans by Mr. Cockerell, architect, of Yarmouth, for the construction of a new grand stand capable of accommodating 1,000 people.

The Board of Works on Friday last finally passed the plans for a new theatre, which is being erected in Panton-street, Haymarket, and which will be opened about September next. Mr. Alex. Henderson, who has obtained a lease for eighty years, has decided to name the new theatre the "Lyric." The building, when completed, will seat 910 persons.

The local board of Redditch last week accepted the tender of Mr. Laws, amounting to £7,051, for sewering the district in accordance with plans prepared by Messrs. Gotts and Beesley, of Westminster, and appointed their surveyor, Mr. Baylis, as clerk of works during the progress of the works at an additional salary of 25s. per week.

NEW GRAMMAR SCHOOL

NEWBURY

DESIGN SUBMITTED BY

J MARTIN BROOKS

ARCHITECT

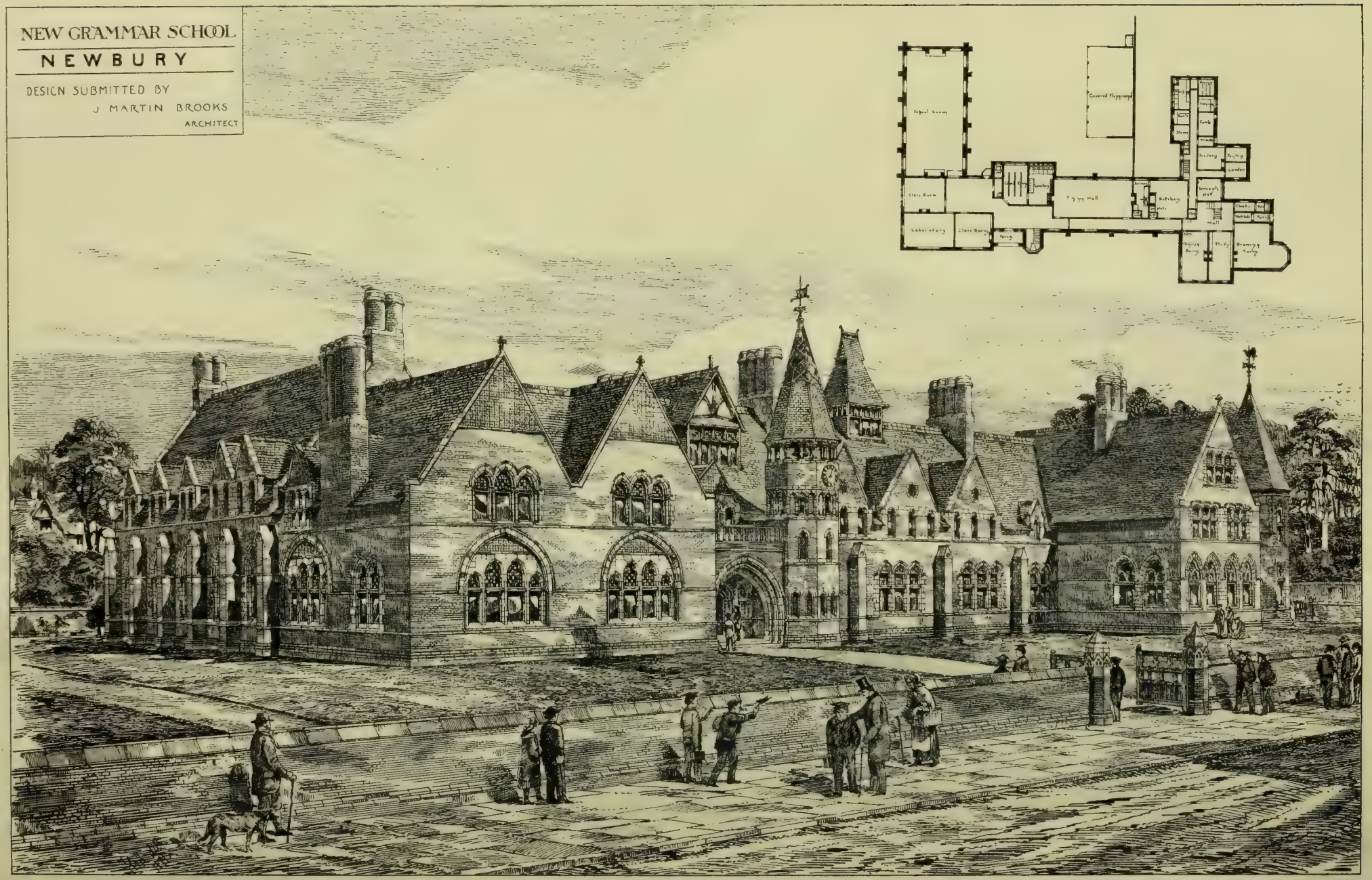
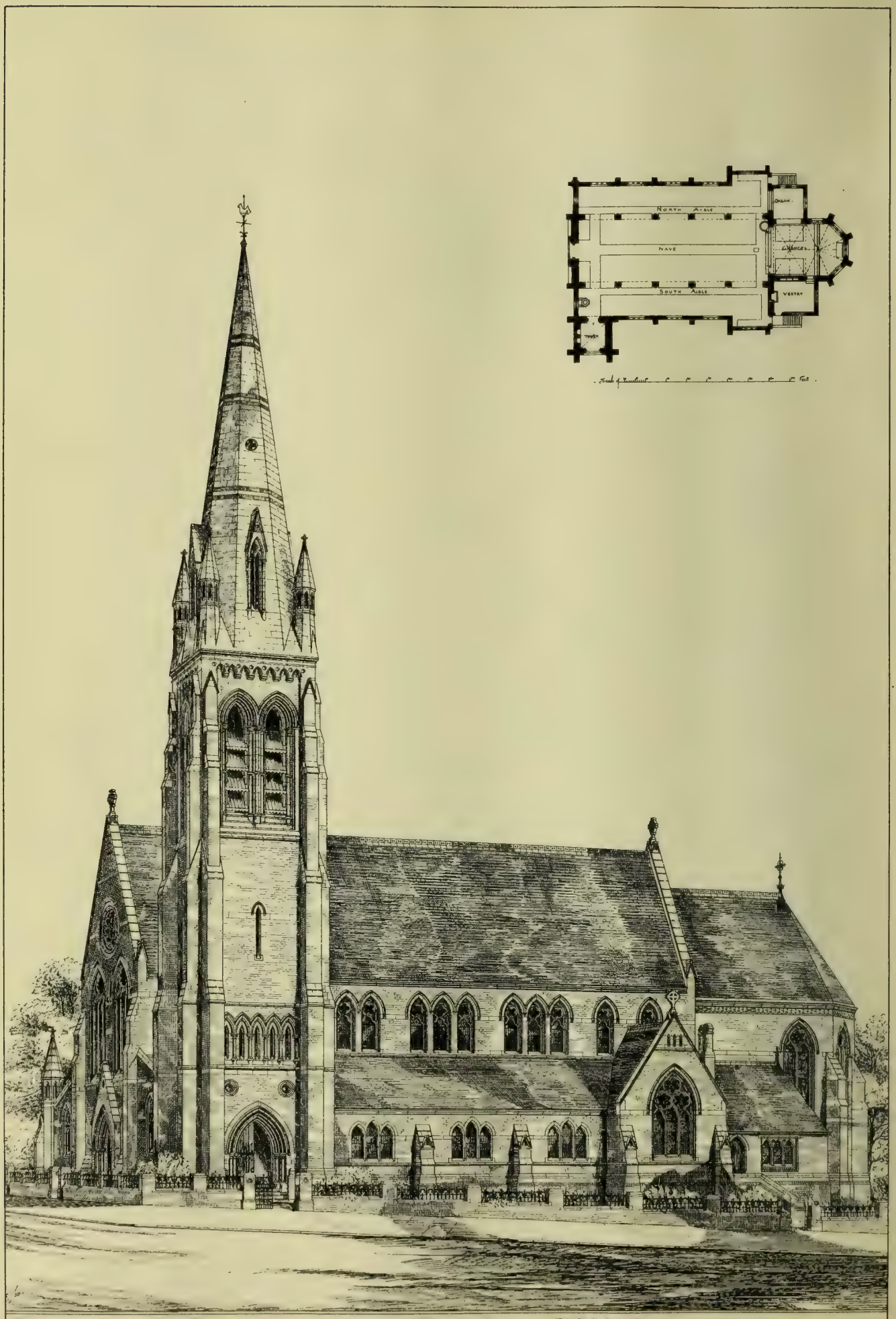


Photo Lithographed & Printed by James Akerman, 6, Queen Square, W C



Church · of · St. Matthias · Brixton S.W. ❋ *Harnor and Waters Archts*

Photo Lithographed & Printed by James Akerman, 6, Queen Square W C

Photo Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

The Princess's Theatre Oxford Street, W.

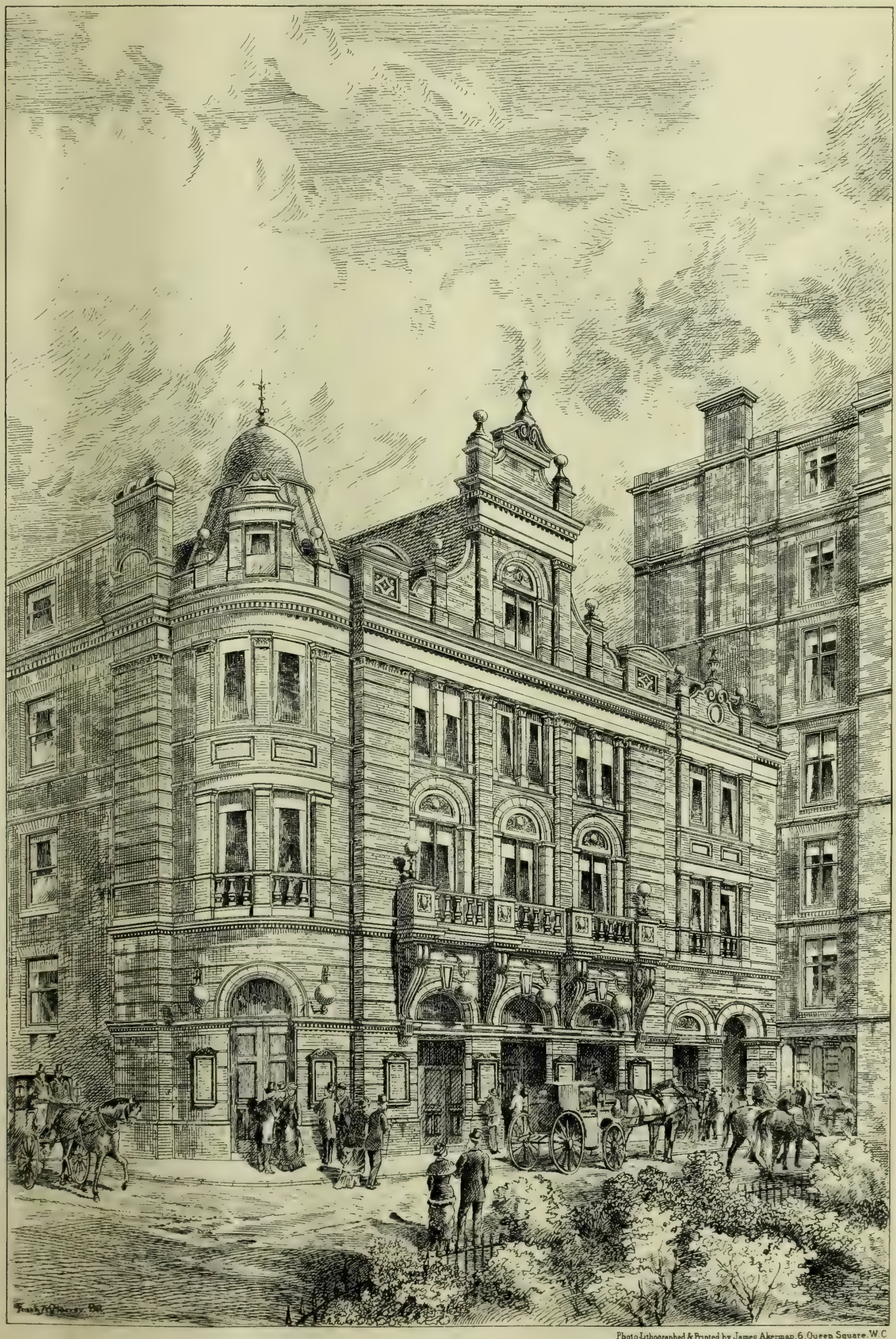
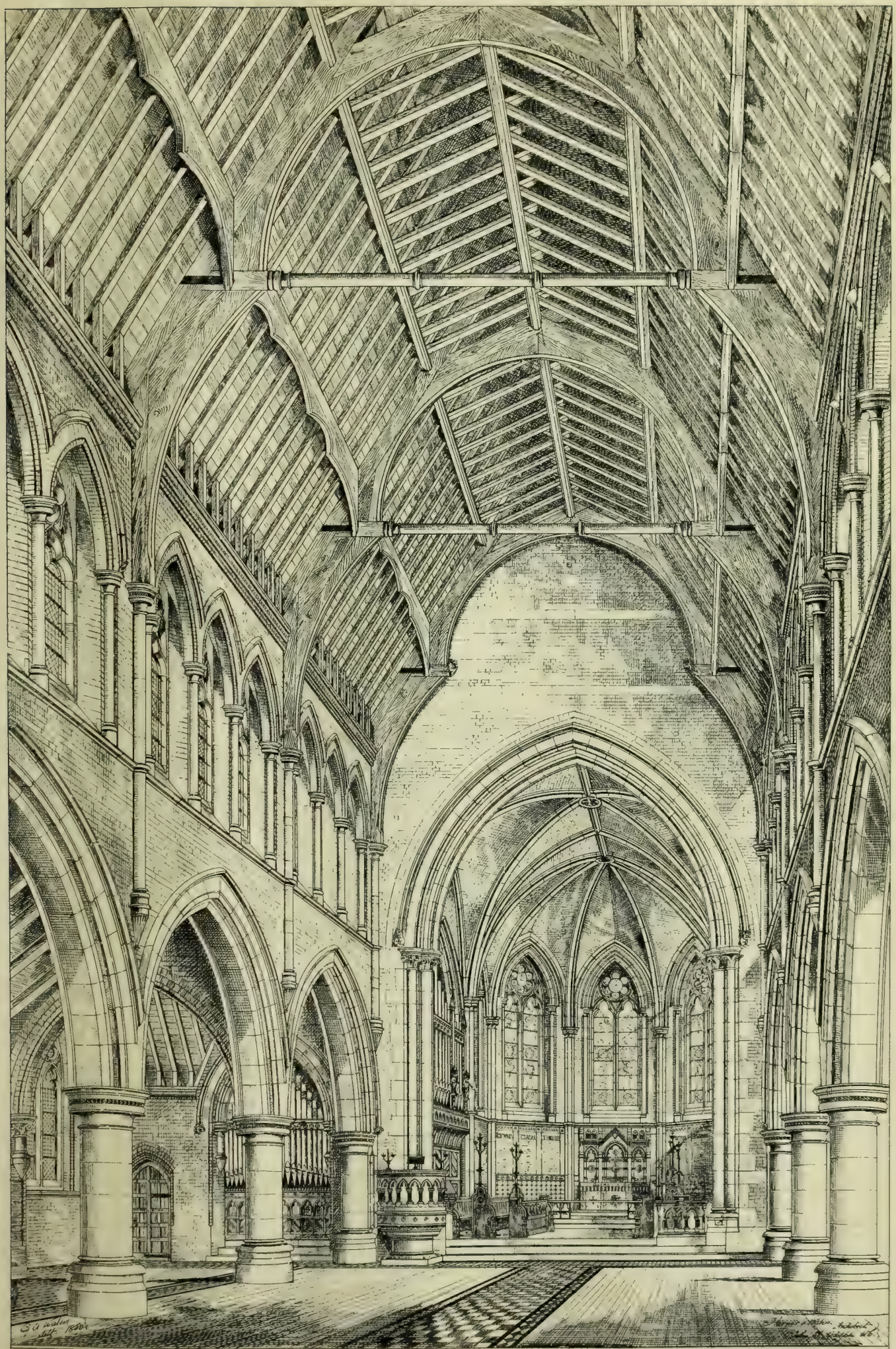


Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

The Beaufort Theatre: Frontage towards Victoria Embankment

C. J. Phipps, F.S.A. Architect



Church · of · St. Matthias · Brixton · · *Interior View*

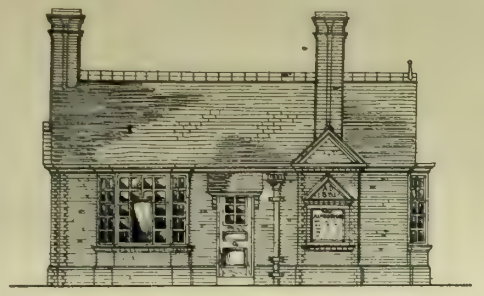
Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

SECOND DESIGN

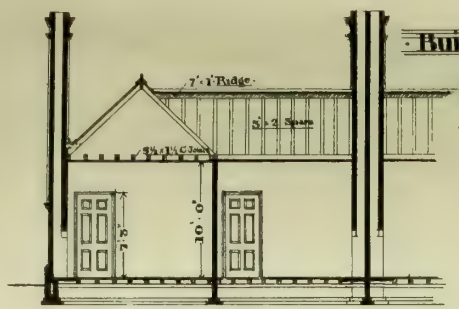
Building News Designing Club

Sketch for the Almshouses by

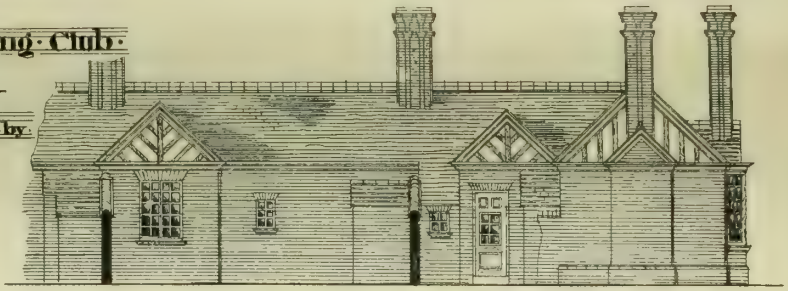
NEMO
1881



End Elevation



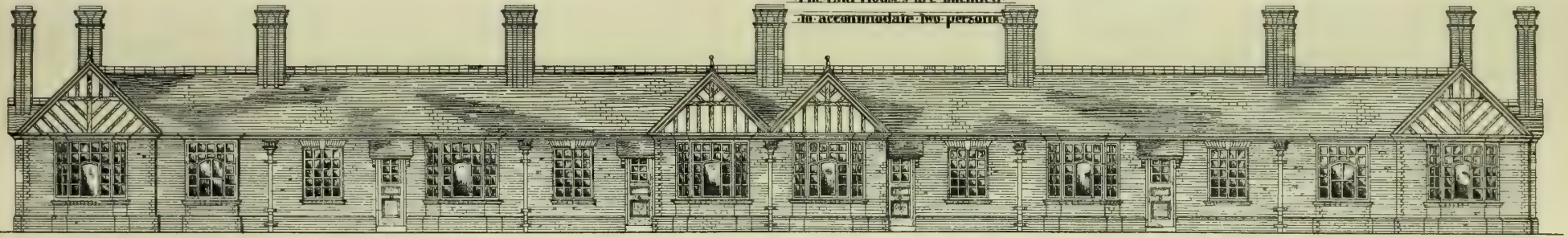
Section on Line AA



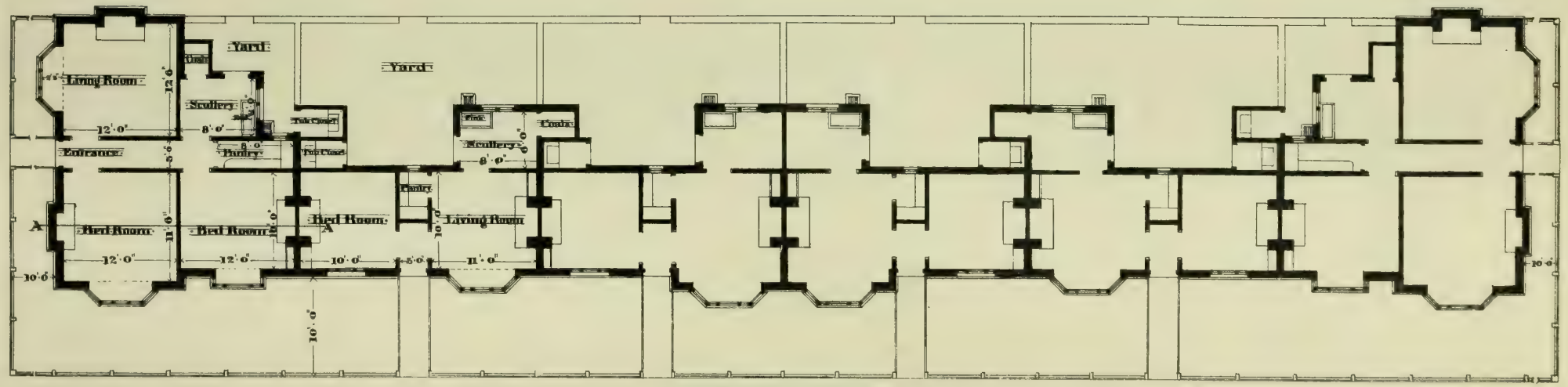
Back Elevation

10 5 0 10 20 30 Feet.

The End Houses are intended to accommodate two persons.



Front Elevation to Road



Ground Floor Plan

Photo-Lithographed & Printed by James Akerman 6 Queen Square W.C.

Building Intelligence.

Dublin.—The hoardings have this week been removed from around the South Dublin City Markets, and the building will be opened for use in about two months' time. The style of the building is a Flemish Gothic, freely treated, and the external fronts are built of red bricks from Leeds, with mouldings and dressings of terra-cotta, Mansfield stone being employed for window-tracery. The chief front to South Great George's-street is three stories in height, and has a central double entrance with traceried windows and a gable to main roof rising 65ft. from ground, and flanked by octagonal turrets. At each angle of the market are pavilions surmounted by high-pitched roofs, finished with iron ridge cresting at a height of 58ft. A belt of forty-five shops open upon the street frontages, the stories above being devoted to private residences. Forty-eight other shops open into the market-square, which measures 240ft. by 120ft. in the clear. This inner space is being concreted, and on it will be placed 150 stalls. The market is traversed by two carriage ways at right angles to each other, and is roofed over with timber on cast-iron girders and columns in ten bays, the southern slopes being slates, and the northern ones glazed with obscured glass. Five or six pendant gas sun-burners will be hung between each bay. Beneath the market are stores, 8ft. in clear between floor and ceiling, and arched over with brick. Messrs. W. and R. Mawson, of Bradford, Yorkshire, are the architects, chosen in open competition; Mr. J. Hall Thorpe, of Leeds, is the contractor, and Mr. George Hutchison the clerk of works. The contract for building was taken at £65,000, and was commenced in April, 1879.

East Grinstead.—A new Wesleyan Methodist church was opened on Wednesday week at East Grinstead by the President of the Wesleyan Conference. The church, which will accommodate 300 people, is 45ft. long by 31ft. 6in. wide, and has a small end gallery. The masonry to the front is of local sandstone, rock-faced, relieved with Bath stone windows and dressings. The style is Gothic; plate-tracery is used in all the front windows. The roofs are covered with plain brown tiles. There is a small tower carried to a height of 56ft., the lower part being in masonry, and finished from a height of 30ft. above ground, with plain tile roof. Attached to the church are a schoolroom, 21ft. square, 2 vestries, minister's lavatory, copper-room, boys' and girls' w.c's., &c. Internally, the roof of the church is open-timbered; the platform is in carved and modelled oak. The gallery front in pitch pine. White cathedral glass is used throughout. The church and schoolroom are heated by Constantine's hot-air apparatus at a cost of £48. The contract for the buildings, exclusive of boundary-walls, was taken by Messrs. Charlwood Bros., of East Grinstead, at a cost of £1,277. The architect is Mr. S. W. Houghton, of Southborough, Tunbridge Wells.

Egremont.—The foundation-stone of the new parish-church is to be laid on Tuesday next. It is being built from the designs of Mr. T. L. Banks, and will be Gothic in style and cruciform on plan. It will consist of nave and aisles, 88ft. by 47ft. 6in. wide to outer walls; chancel 24ft. long by 20ft. wide; shallow transepts, each 32ft. long and 8ft. deep; baptistery, vestry, and organ-chamber. At a future time a tower and spire, 100ft. high, will be added. The church will seat 650; will be built entirely of red freestone, from the contractor's quarries at Bankend and Ringing-stones; and the internal fittings will be of pitch-pine, varnished. Mr. John Smith is the contractor, his tender having been accepted at £5,775.

Higher Openshaw.—On Wednesday week, the 23rd March, the Lord Bishop of Manchester consecrated the new church of St. Clement's, Higher Openshaw. The general plan is oblong, the south side being parallel with Ashton-road. The only projections are the chancel and two porches. The style is that of the Geometrical period. The two side-aisles are of good height and are roofed by a "lean-to" against the clerestory-wall above. Internally the dimensions of the church are as follows: Extreme length, 119ft., by a width of 52ft.; the nave from floor to ridge is nearly 50ft.; and the chancel 46ft. The walls internally are plastered between stonework, and open-timbered roofs have been adopted. Durnford parpoints are used throughout the exterior, with Yorkshire dressings to all windows and angles. Accommodation has been provided for 648 worshippers. The contractors for the superstructure were Messrs. Wilson, Toft, and Huntley, Messrs. Cordingly and Stopford doing the mason's work. On the eastern portion of the site a vicarage is to be built, and this, with a tower, will be proceeded with when funds justify the outlay. The whole of the works were executed from designs prepared by Messrs. George Enticknap and Walter K. Booth, architects and surveyors, of Cooper-street, Manchester. The estimated cost of the works under the present contract, exclusive of the tower, is about £5,350. The alabaster pulpit and font were carved by Earp and Hobbs. The reading-desk and lectern were made by Larmuth and Sidebotham.

Ipswich.—The new museum in High-street is approaching completion, and will be opened about Midsummer next. The building is Queen Anne in style, and is erected of local red bricks with dressings of darker red and Bath stone mullions. It contains an entrance-hall 33ft. by 18ft., leading into a southern museum 103ft. 6in. long by 26ft. wide, and a central museum 71ft. 9in. long by 33ft. wide, each lofty, and lighted by double skylights, and provided with a wide gallery; a library and reading-room, 73ft. by 27ft., to be seated for 350 people; a science classroom on the north side of building, accommodating 150 students; art classroom, 72ft. 6in. by 26ft.; laboratory, and science master's room. The cases are being transferred from the present museum in Museum-street, and arranged in the new buildings, by Dr. J. E. Taylor, the curator. The contractors are Messrs. J. B. and F. Bennett, of Ipswich, and the clerk of works is Mr. R. T. Orr; the architect (selected in competition) of the museum, and the adjacent Ipswich Fine Art Society's hall, which was opened last spring, is Mr. Horace Cheston, of London. We illustrated the design for the museum on Aug. 29, 1879.

Kirkdale.—A new cemetery at Kirkdale, Liverpool, was consecrated on Tuesday. It consists of 88 acres, 16 of which have at present been laid out for burial purposes. The churches and offices attached to the cemetery were built from the plans of Mr. William Duckworth, jun., architect. There are three chapels provided, those for the Church of England and Nonconformist denominations being grouped so as to form exteriorly one building. This is placed nearly in the centre of the site; the remaining chapel, that for the Roman Catholics, being placed about 90 yards to the north-west. The style is Geometric, or Thirteenth-century Gothic. A clock tower and spire, reaching to the height of 90ft., are attached to the grouped chapels, while a spirelet 70ft. in height rises from the south-western corner of the Roman Catholic chapel. The lodge and registrar's house are placed on either side the entrance from Longmoor-lane. The style adopted is domestic Gothic of a simple character, harmonising with that of the chapels. The contractors for the churches and lodges are Messrs. G. Wood and Son, Bolton; and for the road-making and drainage, Mr. D. A. Jardine, St. Helen's.

Limehouse, E.—The new town-hall for Limehouse was formally opened on Tuesday. It is situate in the Commercial-road, and is a rectangular structure in the Italian style, having in front an open portico carried on polished granite columns. The façades are of white Suffolk brick and Portland stone, with arched windows. On the first floor is the large meeting-hall, which is 70ft. by 40ft., and 26ft. high. It is lighted by day with eleven casement windows, and by night with three sunlight burners; at one end is a platform 12ft. wide, and at the other a gallery of equal width. The ground-floor is subdivided into vestry-room, officers' room, clerks' offices, strong room, collectors' office, and porters' office. The foundation-stone was laid in October, 1879, and the design was illustrated in this journal some years since. Messrs. A. and C. Harston were the architects, and Mr. Johnson was the builder. The cost has been about £10,000.

Liverpool.—The Baptist chapel which has been erected opposite the Prince's Park Gates in Prince's-road, Liverpool, the foundation-stone of which was laid on the 1st July, 1879, was opened on Sunday. The chapel has been designed to accommodate about one thousand persons, and consists of a nave 75ft. long by 52ft. wide, occupied by ground-floor seats and a gallery on three sides. Under the whole of the ground-floor of the chapel is provided a lecture or school-room of the same size as the body of the chapel. The chapel, lecture, and school-rooms are heated by hot-water pipes, around and under gratings in the aisles. The ventilation of the chapel is so arranged that there is fresh air admitted, and the vitiated air passes into a space in the main roof, and from thence is extracted by a Boyle's cowl. The coronas and gasfittings are admirable specimens of artistic work, and are from the workshop of Mr. A. Bucknall, Renshaw-street. The exterior is of an Italian or Romanesque character. The builders are Messrs. Brown and Backhouse, Mr. Henry Sumners, F.R.I.B.A., Imperial-buildings, Dale-street, is the architect.

Salisbury.—A canopied tomb and recumbent figure in Salisbury Cathedral, forming a memorial of the late Bishop Hamilton, were formally presented to the Dean and Chapter on Friday. The effigy of the bishop has been modelled and designed by the Hon. and Rev. Bertrand Pleydell Bouverie, and executed under his direction by Mr. R. Glassbury. It is of white statuary marble, and represents the bishop as clothed with the stole, cope, &c., and having at his left side his pastoral staff. The dress is that of a priest of the 13th century, but the hands are folded on the breast, whereas at that period the custom was to represent a bishop with the right hand slightly raised and the fingers placed in the attitude of blessing. Over this figure is an Early English canopy, designed by the late Sir Gilbert Scott, and erected by Mr. White, of Vauxhall-bridge-road, London, under the supervision of Mr. John Oldrid Scott. On either side are five open arches, with supporting columns, which bear the coping. The columns are each formed by three clustered pillars of Purbeck marble, with caps all differing of a floriated character, suggested by those in the Chapter-house. The coping or roof is divided by arched ribs, springing from the columns with diagonal ribs, having varied bosses at the intersection. The stonework is all from the Hindon beds of the Chilmark quarries. The carving of the canopy has been executed by Messrs. Farmer and Brindley, of Westminster Bridge-road.

COMPETITIONS.

Blackburn.—A new Wesleyan chapel, to seat 650, at a cost of £2,500, is about to be erected in Griffin-street, from the designs of Mr. Woodhouse, of Bolton, whose plans were selected in competition with Messrs. Waddington and Son, of Burnley; Messrs. Thackeray and Woods, of Darwen; and Mr. Miles Aspinal, of Blackburn.

Cardiff Infirmary.—The governors of the Glamorganshire and Monmouthshire Infirmary discussed, for over three hours, on Monday, which architect or architects had been selected in the recent competition. It transpired that, to quote the words of the *South Wales Daily News*, "there had been an extraordinary want of care on the part of the building committee in conducting the negotiations," which took place after the plans of Mr. Bell, of Manchester (submitted under motto "Health"), and of Messrs. James, Seward, and Thomas, of Cardiff (motto "Tria Juncta in Uno"), had been selected as the best two in the competition. The report of one of the referees, and other documents essential to a complete statement of the case, were admitted to be lost, and it was allowed that both of the competitors had been appointed architects inferentially. By a large majority, Messrs. James, Seward, and Thomas were finally instructed to carry out their plan for the new infirmary for 100 beds, and it was suggested that compensation should, under the peculiar circumstances, be paid to Mr. Bell. Both the Cardiff newspapers publish articles severely commenting on what they term the "infirmary scandal."

Finstall.—The Stoke Prior (Worcestershire) United District) School Board have accepted the designs of Mr. John Cotton, architect, of Birmingham and Bromsgrove, for the new schools about to be built at Finstall, near Bromsgrove, and for which there has been a recent architectural competition. About eight sets of plans were sent in.

SCHOOLS OF ART.

Bristol.—The annual distribution of prizes and certificates was made on Monday week at the Museum. The committee in their report spoke of the increased prosperity and efficiency of the school, and stated that the attendances at the evening classes were last year more numerous than at any time previously. The successes gained by the students compared favourably with those of former years. Mr. J. Nicholl Smith, the head master, also read a report in which he stated that the work of the school had been more satisfactory during the past twelve months than at previous periods.

Oldham.—The new Science and Art Schools, built at the cost of nearly £10,000 by Messrse Platt Brothers, and by them presented to th. town of Oldham, were formally opened by Earl Derby on the 17th ult. They adjoin the Lyceum premises, and are similar in character of design, being erected of stone in large blocks. On the ground-floor are two machine drawing and geometry rooms, each 42ft. 9in. by 27ft. 6in., accommodating 65 students each; a third room for machine drawing 42ft. 9in. by 20ft., and a master's office 20ft. by 16ft. 9in. The first floor is similarly planned, and set apart for classes on building construction, mathematics, and mechanics, technology, and a laboratory. On the second floor are the art room, chemical lecture-room, and chemical laboratory. Heating is by hot-water pipes at low pressure. The fittings are all of St. John's pine, stained and varnished, except in the chemical laboratory, where pitch-pine is used. The total number of students, for whom desks and seats are provided, is 651; but the full capacity of the school is for 1,500 students. The architects were Messrs. George Woodhouse, of Bolton, and Edward Potts, of Oldham and Manchester. The contractors were, for excavating, drainage, and masonry, Messrs. J. and S. Smethurst; brickwork, Messrs. J. and O. Partington; carpentry and joinery, Messrs. C. Schofield and Co.; slating, Mr. D. Jackson; plumbing, glazing, and painting, Messrs. Buckley, Son, and Hallsworth; heating and ventilating, Mr. W. W. Phipson, London; and rolled iron beams, Messrs. Measures and Co., Southwark.

The Female School of Art.—On Monday afternoon the Lord Mayor presided at the annual distribution of prizes gained by the students of the Female School of Art, in Queen-square, Bloomsbury. Mr. Francis Bennoch, the hon. secretary, read the annual report, in which the committee express their satisfaction that two national silver medals and one bronze medal and five Queen's prizes of books had been gained in competition with all the schools of art in the United Kingdom, and their gratification at the general excellence observable in the work of the various classes of students, as shown by the 61 third-grade prizes obtained, being the largest number ever awarded to the school. During the past year 223 students received instruction in the various branches of art education. In April, 21,222 drawings and seven models were forwarded to South Kensington from the school, being the works of 162 students, or an average of more than 13 by each competitor. The national silver medals were gained by Miss E. C. Nisbet and Miss E. Harris, the bronze by Miss Reason, and the Queen's prizes by Misses Chaplin, Lovell, Rouse, Spiller, and Whittaker. The Queen's gold medal was awarded to Miss Reason, the Clothworkers' Company's scholarship to Miss Wood, and the Subscribers' scholarship to Miss Waugh. The judges were Mr. Yeames, R.A., Mr. Morris, A.R.A., and Mr. Fildes, A.R.A.; and for the Gilchrist prizes, Mr. Poynter, R.A. The Gilchrist scholarship was won by Mdlle. Bodé. Several students had taken art mistresses' certificates of the highest grade. The efficient working of the school was much hindered and all projects of improvement stopped from the lack of means to extend their premises. The fund for the raising of the Queen's scholarship to the permanent value of £60 per annum now only required £450 to complete it. The committee announced the foundation of a scholarship of £40 by the Baroness Burdett-Coutts. Her Majesty continued her influential personal patronage to the school, and had this year become the purchaser of the work "A British Sailor," by Miss Reason, the Queen's scholar. The committee congratulated the superintendent, Miss Gann, and her able assistants, on the success of the school.

Dublin.—The annual distribution of prizes and certificates to students of the Dublin Metropolitan School of Art, founded in 1731, was made by Earl Cowper, Lord Lieutenant, on Thursday, the 24th ult. In the course of an address on the position of the school, Dr. Steele attributed the backward state of the school to the absence of a museum of ornamental art from the city. In Dublin, during last year, they had 509 pupils against 841 in the art schools of Edinburgh, and 3,563 in those of London; at the last examination Dublin gained only 2 second-grade prizes against 85 in Edinburgh and 314 in London; 17 third-grade prizes, against 71 in Edinburgh and 237 in London, and 3 in the national competitions (2 bronze medals and 1 Queen's prize) as against 26 (including 1 gold medal) in Edinburgh and 85 (including 6 gold medals) in London. Yet the result of the examination was, for Dublin, unusually good. This spring it was intended to erect a new school of art building, and when that was completed the present premises would be used as an art museum.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Birmingham Architectural Association.—An ordinary meeting was held on Tuesday evening (the 29th) at the Room, Queen's College, under the presidency of Mr. R. B. Morgan, chairman of the Association. After the business, a paper on "Pictorial Art" was read by Mr. W. H. Vernon, a well-known local artist. The subject was treated at great length and the paper was highly interesting. At its close a hearty vote of thanks was accorded to the author.

Exeter Diocesan Society.—The Exeter Diocesan Architectural Society held its quarterly meeting on Thursday, the 24th, in the College Hall in South-street, the archdeacon of Barnstaple being in the chair. The attendance was not large. The Rev. J. L. Fulford, the secretary, read the report of the committee in which was described the Exeter Church extension scheme through the erection of a new church (St. Matthew's) to be shortly commenced, the architect being Mr. Fulford; and also an iron church in St. Sidwell's parish; the erection of a new chancel and reseating St. Petrock's by Messrs. Hayward, and alluding to some restorations going on in different parts of the county—the rebuilding the nave of St. Peter's, Plymouth, under Mr. Prynne; a new church from plans by Mr. St. Aubyn, for the hamlet of Nott, in the parish of Revelstoke. Allusion was made to the present clearing of the site and removing materials of the scarcely-remembered King John tavern in South-street, which had a half-timbered front, removed above forty years since, with various curiously-carved figures of Henry VII.'s time, and still preserved in the city. Drawings were shown of the original front. A paper was read by Mr. Ashworth, architect, "Notes on some North Devon Churches," describing the screen work and good towers of the churches of Lapford, Atherington, Coleridge, Chawleigh, Chulmleigh, Bishops Nympton, Chittlehampton, Tawstock, the peculiar spires of Kingsnympton, Barnstaple, Swimbridge, &c. The paper was illustrated by a number of plans, detail drawings, and sketches in water-colours.

ARCHÆOLOGICAL.

Antiquities in Asia Minor.—M. Léon Cahun, who went out last year to the East, charged with a mission from the French Minister of Public Instruction, has returned, with his wife, who accompanied him. He has been able to explore little-known parts of Northern Mesopotamia, and examine a good number of undescribed ruins. Among the most interesting are those of a manufactory of pottery established at Rakka in 1108 by the Sultan Mahmoud-Abou-al-Hasim; Parthian ruins at Djaber, and a Roman villa absolutely intact at Ressafa, the ancient Sergiopolis, between Palmyra and the Euphrates.

The parish-church of Newnham, which was destroyed a few weeks since by fire, is to be rebuilt under the supervision of Messrs. Waller and Son, of Gloucester, who were the architects for the recent restoration of the church.

A Hundred Thousand Replies and Letter on subjects of Universal Interest have appeared during the last ten years in the ENGLISH MECHANIC AND WORLD OF SCIENCE, most of them from the pens of the leading Scientific and Technical Authorities of the day. Thousands of original articles and scientific papers, and countless receipts and wrinkles embracing almost every subject on which it is possible to desire information have also appeared during the same period. The earliest and most accurate information respecting all new scientific discoveries and mechanical inventions is to be found in its pages, and its large circulation renders it the best medium for all advertisers who wish their announcements to be brought under the notice of manufacturers, mechanics, scientific workers, and amateurs. Price Twopence, of all booksellers and newsvendors. Post free 2½d. Office: 31, Tavistock street, Covent-garden W.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

ADVERTISEMENT CHARGES.

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The charge for advertisements for "Situations Wanted" is One Shilling for Twenty Words, and Sixpence for every eight words after. *All Situation advertisements must be prepaid.*

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(Payable in Advance.)

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Mr. R. M. Tuttle, of 13 and 15, Laight-street, New York City, is authorised to receive American subscriptions at the rate of 6 dols. 40c. per annum.

Cases for binding the half-yearly volumes, 2s. each.

Received.—H. W.—J. P.—P. and Son.—W. B. S. and Co.—W. and Son.—J. A.—H. and G.—C. L. H.—I. and Sons.—A. R.—D. and H. J. N.—E. D.—W. B. W. and Co.—E. M.—S. A. Co.—F. W. S.—R. L.—C. and Co.—F. and A. W.—G. and Co.—J. H.—J. M.—J. J. C. and Co.—P. H. D.—G. B. and L.—F. I. Co.—W. W.—W. R. and Son.—C. H. S.

Provincial Student. (Write to the Secretary, at 9, Conduit-street, W.)—Lex. (It would not be fair.)—J. H. C. (Nicholson's Dictionary is rather out of date, though the terms in construction are generally good. We know of no other modern practical dictionary.)

"BUILDING NEWS" DESIGNING CLUB.

Drawings Received.—Bonus Hominus, Nemo, Fred.

Correspondence.

THE NEW PRESIDENT OF THE R.I.B.A.

To the Editor of the Building News.

Sir,—Will you allow me to protest against the idea that the election of my friend, Mr. Horace Jones, "would be highly derogatory both to the Institute and to the profession"?*

It is not a question of electing the most suitable man. On the contrary, it is simply one of routine, like the election of the Lord Mayor.

I have reason to believe that many Fellows of the Institute think with me that the sooner we return to the old mode of election the better.

Let us therefore demand a special meeting, discuss the question, and if strong enough effect a change; but it appears to me very unfair to commence the business by making a set at Mr. Horace Jones, who, as an architect, will not suffer in comparison with either the present or past President.

Another point for discussion might be the expediency of members remaining year after year on the Council.

In the new list of Council just published some of the names sound very like "household words."—I am, &c.,

March 29. W. Burges.

* See Building News, March 25, 1881, page 343.

Sir,—Kindly allow me to trespass a little on your space, by way of supplement to the letter you published last week.

A contest for the Presidential chair would be unseemly, and is therefore to be deprecated. It is the highest honour the Institute can bestow, yet in most instances the position has been graced by the notability and services of those who have filled it, quite as much as it has honoured them.

The relative professional position of any gentlemen who may now be nominated will be known to none better than to those gentlemen themselves, and I venture to express a hope that all claims may with graceful courtesy be withdrawn in favour of the more acknowledged leader, and so allow the election to be by acclamation.—I am, &c. R. E. P.

CHIPPING NORTON CEMETERY COMPETITION.

Sir,—Observing the letter by "One of the Forty-seven" in last week's Building News, we wrote to the secretary to inquire if the matter was settled, as stated.

The following is the reply received this morning—by which it will be seen that the Corporation intend to adhere to the amount stated in particulars.—We are, &c.,

Webb and Tubbs.

1, Blagrave-street, Reading, March 29.

Chipping Norton, 28 March, 1881.

Dear Sirs,—I am sorry I have not earlier informed you the result of the competition for the plans of chapel and lodge for cemetery. There were 47 sent in, out of which the Town Council selected 4, of which yours was one, and in the event of the plan first chosen not being within the £500 limit, they will fall back on the other three in the order of choice.—Yours truly,

G. H. Saunders.

To Messrs. Webb and Tubbs, architects,
1, Blagrave-street, Reading.

SEWER VENTILATION AND EXTERNAL SOIL-PIPES.

Sir,—In your issue of 18th February you gave an abstract from a report of mine upon the above subject, which drew from Mr. Buchan the strongest expressions of disapproval; however I do not wish to reply to Mr. Buchan's sneers, but to try and place the consideration of the subject upon a broader basis than the merits of a patent trap.

The question of inside or outside soil-pipes has been so exhaustively discussed in your columns, that it seems to me the advantages of either system are so evenly balanced, that their application may very well be decided by local circumstances. For instance, in ventilating the drains of an existing building, the soil-pipe might be carried up outside to avoid cutting through ceilings, floors, stairs, and roofs, and there is no doubt the possibility of sewer gas entering the house is thereby reduced to a minimum; but the experience of the recent severe winter I think justifies one, when building a new house, with good materials and workmanship, in taking the vertical soil-pipe inside and ventilating it above the roof, always providing free access for inspecting, cleaning, and repairing the whole length. Any attempt to cover up or protect the outside soil-pipe from frost is rendered useless by the carelessness and indifference of the ordinary householder, as witness the case of water-pipes, where the most ordinary precautions against frost are notoriously neglected.

The better ventilating action of the inside-pipe is shown by Mr. Buchan himself in his letter of 11th March, where he states that the current through an inside-pipe varies from 100 to 400ft. per minute, while through an outside-pipe it is only from 0 to 20ft. per minute, and I submit that this simply means that an inside-pipe draws atmospheric air into and through the drain or sewer from the nearest inlet—be it a Buchan's trap or the nearest street ventilator upon the main sewer—at a rate from 20 to 100 times greater than an outside-pipe does.

Mr. Buchan seems to have entirely misunderstood the facts contained in Dr. Buchanan's report upon the Croydon epidemic, 1875. The report certainly gives a sketch of a plan (somewhat similar to mine) for ventilating the drains of *new houses*, that had then recently been adopted in Croydon, but it had nothing to do with the epidemic; neither does Dr. Buchanan mention any cases of fever originating in any houses so treated; on the contrary, he says, the fever was mostly confined to one parish, comprising the oldest and worst sewered portion of the town, and that 90 out of the total of 104 deaths occurred there. In this parish there was no ventilation of house-drains, except through overflow-pipes, leading directly into the sewers from cisterns of drinking water, "that were usually placed in very confined situations under bedroom floors." At the same time, the main sewers were admittedly too small for their work, the means of flushing limited; the street ventilators were from 120 to 250 yards, and, in some cases, half a mile apart, and were all inoperative from being stopped up with charcoal trays, which were removed during the course of the epidemic.

In commenting upon the sketch, Dr. Buchanan says that the ventilating pipes "were habitually too small," and, while disclaiming any knowledge of engineering details, he gives a second sketch, embodying the principle of Mr. Buchan's trap, and suggests its adoption as an improvement upon the latest plan then in use at Croydon.

Now, I do not, as Mr. Buchan supposes, lay claim to any new discovery. I simply ask, now ventilation is almost universally acknowledged to be the only effectual method of dealing with sewer gas, that its advocates should have sufficient faith in the principle to apply it logically and thoroughly.

Given, therefore, well-laid sewers of proper capacity, with street ventilators every 60 yards, and 6in. house-drains with 4in. soil-pipes, carried up the full size for ventilators above the roofs, such a constant current of air would always be entering at the street ventilators, and finding its exit at the soil-pipe ventilators above the roof, that no sewer-gas could accumulate, and, therefore, any trap introduced into any part of the house-drain to interfere with this current is worse than useless, however ingeniously constructed.

Thus for every 60 yards of main sewer in an ordinary street, we get, say, 24 soil-pipe ventilators, 4in. diameter, if the houses are in close order; or, say, 16 if the houses are semi-detached, all drawing air into the sewer through the street-ventilator immediately below them.

It is argued that householders have nothing to do with the ventilation of public sewers. Why not, when the sewers are made for their benefit? The householder has the use of the public sewer. Why, therefore, should he block the way to the only natural safe and efficient point of ventilation above the roof, but insist upon the present feeble and stagnant system discharging at the street level, by placing in his yard or garden a patent trap which is sure to be forced when the water in the sewer rises above the mouth of the house-drain?

Trusting you will be able to find room for this, I remain, Sir, yours, &c.,

R. Read, A.M.I.C.E.

28th March. City Surveyor, Gloucester.

Sir,—The more flatly Mr. Buchan contradicts the more he seems to involve himself. He denies having said such a preposterous thing as that by increasing the rate of pure air passing through a pipe by 2,000 per cent., the emanations would be more foul. But this is the very thing which he alleges, when he argues that the pace of upward current through an exterior-pipe would be 20ft. per minute, and through an interior one 400ft. per minute, and yet at the same time maintains that—whether in spite of this or because of it—the sewer-pollated air given off into the atmosphere is greater in quantity and worse in quality through one fitted inside than through one fitted outside. Of course he may ingeniously say that, although pure air be admitted at the lower open end, no pure air whatsoever *can* pass through, because it becomes polluted in its passage upwards and outwards. But granting him the full benefit of this, I must confess my utter inability to see how an increased quantity of pure air admitted, and at a vastly increased rate, should increase the evil rather than diminish it. The *quantity* is largely increased, but if it be also at the vast increase of impurity the result must be fearful indeed. And the same may be said of the splashing of a pipe being no better, if no worse, than a stagnant deposit of fæcal matter in a badly-constructed drain. I must apologise if I have wasted your space, or exhausted your reader's patience with such trivialities; but Mr. Buchan has urged his point against me with such apparent soberness and seriousness that it seemed scarcely right to let it pass unchallenged. At all events, I am not alone in my view that something may be said on the side of internal pipes. Even if a little bad air should leak out of the soil-pipe into a thoroughly ventilated isolating shaft, and be carried off by it, it would be better than the almost certain stagnation which would take place in the ventilation of an external one at times of extreme heat or of extreme cold.—I am, &c., William White, F.S.A.

Wimpole-street.

DISCONNECTING TRAPS AND THEIR VENTILATION.

Sir,—I confirm all I said at p. 281, for I don't think it of importance that Mr. Buchan does not agree with what I said there about soil-pipes, traps, &c. I am, in fact, of the same opinion, as to his knowledge of the subject, as Mr. J. P. Seddon plainly expressed in your issue of 28th January, 1876, and as I suppose Mr. White is, from what he said at p. 315, 18th inst.

Mr. Buchan will hardly be taken as an authority either as to the effect of sunlight or germs, I suspect, if the latter really do exist in a properly ventilated soil-pipe. As a practical plumber, he may know what "wiping a joint" means, but such a term even may not be correctly understood by other people.

I am not a plumber; but I suppose "wiping" means completely polishing off, or neatly finishing. Mr. Buchan thinks the inlet and outlets of a soil-pipe should be the same as its full sectional area; so, if he were asked as to the best way to ventilate a room or a building, he would probably say, disregarding the inconvenience and expense: Do away with the ceiling, or take the roof off, entirely forgetting, in the case of a "regulator," that the opening for escape of air from it, *under pressure*, is infinitesimal; yet, as a practical plumber, he ought to know it is quite sufficient for the purpose for which the "regulator" is used. Again, while Mr. Buchan objects to my small inlets and outlets as "serious mistakes, especially for long soil-pipes," he says, in a patent *he* took out in 1877, he "provided a small inlet pipe to ventilate the trap and all pipes connected therewith." This, I suppose, is as "patented" by the Edinbro' Air-Chambered Trap in 1875, which is also an outside gully-trap.

I did not refer, in what I said as to the advantage of a close trap at the foot of a soil-pipe, to any trap "difficult to get at and necessarily expensive," &c.; on the contrary, it is not at all necessary now to unscrew bolts, &c., to effect easy examination and cleansing, as your readers know, and I still feel quite sure any proper close trap is far better than an outside gully-trap, for the reasons I have previously stated, as well as others, owing to the difficulty of making a secure and lasting joint between it and the soil-pipe. I should certainly not myself use an earthenware trap for the foot of it. Opinions may perhaps differ as to this, and it really is amusing to observe how seriously circumstances in sanitary matters seem to alter cases. Mr. Buchan has himself said enough on inside and outside soil-dipes to determine thinking people south of the Tweed which plan is the best to adopt, I fancy.

Allow me here to remark, when I patented my lever-trap in 1872, and cowl in 1874, all that anybody then thought it necessary to prevent was the ingress into the house of gas from the sewer. It is unnecessary now to claim that the lever-trap—an expensive one no doubt—effectually accomplished that, or to remind your readers that both the trap and cowl together, without an inlet in a proper position between the two, were but delusions and snares, and left cottages and castles alike unsafe, in fact, "mere deadly fever-traps," in which dreadful condition, I am warranted in saying, almost all still remain, however recently and expensively constructed.

Almost the first letter I wrote on sanitation (October 5, 1874) in *Sanitary Record*, began with words to this effect: "The use of D traps under each closet should be entirely forbidden by legislative enactment." It is noteworthy that in the Local Government By-laws of 1875, D traps were not disapproved of; but in the amended Local Government By-laws of 1877, the use of any trap of the kind known as a D trap, below a closet, is forbidden. And I entertain no manner of doubt that it is right, when the soil-pipe is so ventilated as to insure a constant quick current of fresh air passing up it, and the house-drain is properly trapped against the sewer, and has a similar current of fresh air made to pass constantly through it also, and independent of that which may be easily made to constantly pass up the soil-pipe. To effect both of these most necessary objects is, in most houses, easy, and obtainable at a comparatively trifling cost, as has been lately shown by Mr. H. H. Collins, F.R.I.B.A.

Sanitary science has unquestionably made more progress during the last five, than during the previous ninety-five, years; it is now the question of the day, and it may be hoped, I trust, that the time is fast approaching when disputes on what to the public are minor matters will cease, and that the community at large will be permitted to derive the full benefit of its recent most important discoveries and advantages.—I am, &c.,

Edw. Gregson Banner.

11, Billiter-square, March 29.

At a county meeting held at St. Mary-hill, near Cardiff, last week, it was decided to proceed at once with the restoration of the nave, in accordance with plans prepared by Mr. J. Pritchard, of Llandaff. The work will include new seats, floor, pulpit, reading-desk, lectern, and extensive repairs to roof. The tower has just been rebuilt, and the chancel renovated from the designs of the same architect.

The annual meeting of the Sussex Archæological Society was held at Lewes Castle on Thursday, the 24th ult., when the officers, general, and editorial committees were all re-elected.

Intercommunication.

QUESTIONS.

[6459.]—**English Cathedrals.**—Will any reader kindly name a good sound work (illustrated) on English cathedrals generally, or any work particularly treating of York and Exeter?—W. W. R.

[6460.]—**Stamped Plaster.**—Will someone kindly describe process for executing this? It is useless giving designs to country plasterers.—A Country Architect.

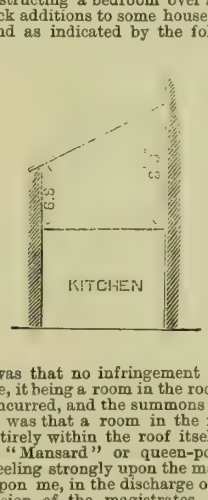
[6461.]—**Echo.**—Wanted, a remedy for preventing vibration or echo of sound? When a person is speaking from a platform at one end of the room, it is almost impossible to understand what is being said. The room is 57ft. 6in. long, by 35ft. wide, and is 16ft. 6in. high at eaves. It is divided into five bays, with four queen principals (of the hammer-beam type), and has a glazed lantern (similar to those used in billiard-rooms), fixed near the central bay, to give additional light to the room. The roof is open up to straining beam of principal, and the walls and ceilings are plastered. Suggested remedies will oblige.—A. Wood.

[6462.]—**Floor 40ft. Span.**—My client wants a room 40ft. by about 70ft., but without columns, and having bedrooms over with lath and plaster partitions, and a trussed roof over. The problem how to carry this floor economically and effectually, by iron girders or otherwise, may be easy to many of the readers of this journal, from whom information would be acceptable to an old subscriber.—A Country Architect.

[6463.]—**Cubing Workhouse.**—Will any of your numerous readers kindly tell me what would be a fair price to cube a new workhouse at, to accommodate, say, from 300 to 400 persons, the building intended to be very plain, built of stone, the quarry being within 3 miles of the site? Should the master's house, hospital, &c., be cubed at the same price? Also the cost per head to calculate for each inmate in a similar workhouse?—J. C. W.

[6464.]—**Baker's Oven.**—Having leased some premises on which I shall have to build a bakehouse and oven (being a baker), it has been suggested to me by a practical man to build the oven with concrete instead of bricks as usual, for two important reasons—first, economy; and, secondly, that if properly constructed the repairs will be almost nihil, as concrete is well known to be a fireproof or fire-resisting composition. Can any of my fellow-readers state whether the suggestion could be carried out with advantage? If so, full particulars as to the proportions of materials in making the concrete would, no doubt, be useful to many in the trade as well as—Baker.

[6465.]—**By-Law of the Enfield Local Board Relating to Rooms in the Roofs of Houses.**—"In any building to be erected, every habitable room, except rooms in the roof, shall be in every part 8ft. in height, at the least from floor to the ceiling, and every habitable room in the roof shall be, at the least, 7ft. in height from the floor to the ceiling throughout not less than one-half the area of such room." The Board, having determined to enforce the observance of their laws, and prevent, by adopting all means within their power, the continuance of the "jerry" building within their district, took proceedings against a builder for an alleged infringement of this law by constructing a bedroom over a small kitchen forming the back additions to some houses now in course of erection, and as indicated by the following sketch.



The defence was that no infringement of the by-laws had taken place, it being a room in the roof, in which the magistrates concurred, and the summons was dismissed. My contention was that a room in the roof is a room constructed entirely within the roof itself. Take, as an illustration, a "Mansard" or queen-post roof in the attic story. Feeling strongly upon the matter, I consider it incumbent upon me, in the discharge of a public duty, to test the decision of the magistrates, and, therefore, shall feel much indebted if your readers will give this a favourable consideration and reply.—W. K.

[6466.]—**Australia.**—Wishing for an Australian appointment, I shall be glad if some reader will kindly reply to the following queries:—What are the prospects of employment for an architect and surveyor's assistant? How should I set about obtaining an appointment? What is the usual remuneration? Is there any Government survey or public works on which an appointment might be obtained; if so, how could it be secured? What are the pay and requirements?—Colonist.

[6467.]—**Lime in Well.**—Will any of your readers tell me if a cart of slaked lime shells emptied into a well (for purifying purposes) will so affect the water that if conveyed from the well by means of a lead pipe, the pipe will be eaten through in the course of two years?—Edinburgh.

[6468.]—**New South Wales.**—Can any reader say what Government appointments are obtainable by a young architect and surveyor in New South Wales, and whether the same are filled by competitive examinations or otherwise? Could a situation be readily obtained in an architect's office, say, in Sidney? Any other information on the subject would greatly oblige.—Migrant.

[6469.]—**Surveying.**—I shall be glad if any of your readers can inform me whether there is a legal handbook for surveyors, giving information respecting the proprietorship of fences, ditches, hedges, and boundaries generally; mode of measuring same, and allowances to be made for overgrowth, &c. I have looked through the principal books on surveying, but cannot find a word on the subject.—Young Surveyor.

REPLIES.

[6406.]—**Felting a Roof.**—It is the custom to board the rafters, and then place the felt upon that, but the felt can be fixed to rafters 12in. apart without boarding, and, if carefully done, the result would be almost equally efficient.—G. H. G.

[6407.]—**Cubing a Building.**—Some estimators include the foundations and roof, others only the roof. The most judicious mode of taking the dimensions of height is to take from the footings to half-way up the roof, or to a point between the wall-plates and ridge, which will give a fair average. To take only from ground floor to upper ceiling is not a fair cubing, as it does not include spaces in which a great deal of material and labour have been expended, and in small buildings their omission would be serious.—G. H. G.

[6410.]—**Clerk of Works.**—The contractor's clerk is the right person to make out the "extras," but the clerk of works might perform the same duty.—Surveyor.

[6420.]—**Maintenance of Roadway.**—In reply to the above question by a "Man in the Suburbs," I have to state that there is a great saving in the maintenance of a roadway by reason of the centre portion of a road being kept up by a tramway company. In my district I have a main road having 3 miles of double trams and half a mile of single trams, the saving alone in macadam stone during the year ending the 25th inst. has been over 1,000 tons. I may add that the road in question has a great and heavy traffic upon it.—Lancashire.

[6423.]—**Chapel.**—I am much obliged to "Quid" for replying to part of my question; but what I particularly wish to know is if it is necessary to put a cemetery chapel, to be used by all denominations, due east and west, or can it be placed any way. A reply will oblige.—Alpha.

[6424.]—**Plate Girder.**—The depth and width of girders are often fixed by the requirements of the structures of which they are to form a part. In the following formula, A = area of bottom flange in inches, D = depth of girder in inches, L = length of bearing in feet, W = breaking-weight in tons on the middle, or double the breaking weight if uniformly loaded. Plate girder.—As the depth and width are not given in the question, let 1-14 of the span, or 19in., be the depth of the girder, it being a good proportion for economy of metal, and let the width be 9 or 10in. When the depth is 1-14 of the span, the safe breaking weight may be calculated as 4 times the safe load; therefore with a stationary and equally distributed load of 12 tons, the breaking-weight in the centre would be equal to 24 tons. Then by the formula $W = \frac{6AD}{L}$, $\therefore 24 = \frac{6A \times 19}{22}$, $\therefore 57A = 264$, and $A = 4{\cdot}63$ square inches for the bottom flange. The top flange should then be $4{\cdot}63 \times 1{\cdot}25$ or $5{\cdot}79$ sq. inches. The depth of the flange is $\frac{1}{4}$ of the depth of the girder, therefore in the case under consideration $4\frac{3}{4}$in. It will be sufficient to have for the bottom flange a plate 6in. × $\frac{1}{2}$in., two angle irons 2in. × 2in. × $\frac{1}{4}$in., and part of web $4\frac{1}{2}$in. × $\frac{1}{4}$in., which gives an area of $4\frac{1}{2}$ square inches. The top flange should have a plate 10in. × $\frac{1}{4}$in, two angle irons $2\frac{1}{2}$in. × $2\frac{1}{2}$in. × $\frac{1}{4}$in., and part of web $4\frac{1}{2}$in. × $\frac{1}{4}$in. This gives an area of 5·9 square inches. A sketch of girder is

given. Cast iron girder, not to be recommended. Taking the same depth, width, and load as in the last example, the breaking-weight in the centre should be 30 tons, since with cast iron it should be calculated as 5 times the safe load. Then by the formula $W = \frac{2AD}{L}$, $\therefore 30 = \frac{2A \times 19}{22}$, $\therefore 19A = 330$ and $A = 17{\cdot}37$ square inches for the bottom flange. Supposing the girder to be loaded on the top, the area of top flange should be $\frac{17{\cdot}37}{3}$, or $5{\cdot}79$ sq. inches. The sketch shows a section which is sufficient to

meet the above calculations. "W. McF." may verify the sections of the flanges itself.—Hugh McLachlan.

[6429.]—**Town Sewage Filters.**—I believe "Beta" would find the following sufficient for his purpose:—At the bottom 6 to 12in. fine clean sand, then 12 to 18in. powdered animal charcoal, 12in. sand, and at the top 1 to 2ft. of gravel. The filtering material would require to be changed occasionally, according to the amount of sewage run through.—Hugh McLachlan.

[6430.]—**Action of Frost on Mortar.**—The answer to W. L. B. Skipton's query depends on the penetration of the frost. If the surface of the joints have peeled off only, they may be raked out and repointed, but if the joint can be easily dug into with the point of the trowel, I should say the mortar would not set again. Generally speaking, only the face of the joints are affected, and not the interior, in which case I should be satisfied with raking out and repointing the joints.—G. H. G.

[6433.]—**Levelling—Reservoirs.**—I should recommend "Koepenick" to get Simm's "Treatise on Levelling" (price 8s. 6d., Lockwood and Co.), or, if an elementary work is required, Baker's "Land and Engineering Surveying" (2s., same publisher). For architectural purposes the latter book would be amply sufficient. For architects' use, a simple spirit-level, mounted on a stand with two apertures for sight and cross wires is often enough. Such is to be had at most instrument-makers. I cannot think of any good treatise on reservoir construction. Slagg's "Sanitary Work," price 3s., may be consulted. Also Mr. Robert Rawlinson's printed suggestions on water supply, which give some useful information. Consult also the volumes of Building News.—G. H. G.

[6434.]—**Bakers' Oven.**—I answered a previous correspondent on this question in your paper published March 31st, 1876, and No. 4392.—Ambrose Wood.

[6436.]—**Fence to Highway.**—"Surveyor" is wrong in making his claim to the centre of quickset. In planting a hedge where there is no ditch, it is usual in most districts to set the same within the boundary to the extent of 1ft. This allows for the growth of hedge, which is seldom less than 1ft. on each side of quickset, and as the owner of a hedge has had possession of that space for a number of years, it would be impossible to deprive him of his claim, but I do not thing he would be entitled to claim anything for the cop or bank. Much confusion has arisen amongst young surveyors about the rights of fences and ditches, through want of practical training. When I was young I frequently came in contact with old surveyors who never deviated from the rule of 4ft. from the quickset for the extent of the ditch. This leaves 1ft. for the hedge and 3ft. for the ditch. It is now frequently my fate to meet with some young upstart who will set up a standard of his own in the same parish. I have had 3ft. 4in., 3ft. 6in., and 4ft. set up by different individuals as the proper rule; but if there is a parish award in existence, it is easy to find out the proper width if the old boundaries have not all been disturbed. One one occasion I had to inspect an award, and I asked an old gentleman in whose custody it was, what he considered to be the allowance for a ditch in that parish. He replied, "4ft. on old inclosure and 3ft. on new. You will find it in the award." Not being able to do so, I requested his assistance, and he likewise failed. He then said, "Well, I could have sworn it was there. I have heard it mentioned so many times." Now, I took the opportunity of trying it on the new inclosure, and found it to be 4ft. In the same parish lived, within my recollection, an old gentleman, a considerable owner of property, who, in cases of dispute was looked up to as an authority, and he always maintained the 4ft. theory; but his son, who succeeded him, finding that he was generally on the wrong side of the ditch, as stoutly maintained that 3ft., or some dimension considerably under the old standard, was correct.—Old Surveyor.

[6436.]—**Fence to Highway.**—In a case like this, "Surveyor" is certainly wrong. The bottom of the roadside of the cop is the boundary of the highway. The following is the best argument in favour of it:—Suppose the road was newly made with no fence whatever, but the side of which is clearly defined by the edge of metalling or otherwise, and Mr. A. wishes to put up a thorn hedge and cop along the roadside to protect his land—would the surveyor be willing to allow him to place half the cop width on the road? No, certainly not. Any gate-post, bank, cop, hedge, or other fence must be set back beyond the side of the road, so as not to interfere with or obstruct in any way whatever the traffic on the road; and inversely it may be argued that if the surveyor refuses to allow the half of cop width to be placed on a new road, but insists, as he should do, upon the whole width of the road being left unobstructed by anything whatever, then he has no right whatever to insist upon taking anything beyond the roadside of the bottom edge of cop as belonging to the road. Reasonable consistency is an arbitrator's jewel. But, again, suppose Mr. A.'s land to be 3ft. above the road, then the cop will be 5ft. high, and the centre of hedge-row 5ft. from roadside of bottom of cop, and the other side of the road the same, and the hedge-rows the boundaries; then the surveyor loses 10ft. out of the width of his road, which is wasteful in the extreme. I believe the Ordnance Surveyors show the hedgerows as the side of the road, but I do not think there is any precedent or reason for doing so. It certainly is not "the custom" in these counties (N.W.) at all events. "Surveyor" is apparently thinking of a railway cutting, which is the only argument in favour of his supposition, but a country road is another thing altogether, as the land for the site is generally given up out of the adjoining estate, and the whole width macadamised is dedicated to the highway.—W. G., Birkenhead.

[6438.]—**Architect's Drawings.**—Unless you can legally prove the verbal understanding mentioned, it would be wiser to give up the drawings to the client. The question of commission does not affect the drawings whatever. "Doubtful" can try the case in law with his client, should it please him. It would be for the benefit of the whole profession, as it is doubtful whether the architect or client has a legal right to the drawings after completion of work.—Hugh McLachlan.

[6438.]—**Architect's Drawings.**—Will "G. H. G." kindly say whether or not I am bound to deliver up the drawings before my account is paid? Can my client legally refuse payment until he receives the drawings? I would also say that in making out the account I did so for "services rendered" without specially naming the drawings. Does this alter the circumstances at all? I thank "G. H. G." for his reply so far.—Doubtful.

[6439.]—**Damp Walls.**—Rake out the whole exterior joints 1½in. deep, fill up with good honest red-lead putty, incorporated with hemp to bind it, afterwards caulking the whole with a blunt end piece of wood, finally finishing the joints with more material of some kind, and make uni-

form with a small trowel in usual way. This process may be slightly costly, but it would only be doing it *once*. Stop out, and not keep out, is my advice. Washings and other daubings so often suggested are sheer waste of time and money, and "bunkum," to boot. Kill or cure; adopt no quackery.—Old Silas.

[6439.]—**Damp Walls.**—I have little faith in external applications under the conditions stated. One plan recommended and found to answer for stonework is a solution of soft-soap, ¾lb. of soft-soap to the gallon, followed by a solution of alum, ½lb. to the gallon. Ransome's indurating solution, on which an insoluble silicate of lime is formed in the pores of the brick, has been used with success. The "Petrifying Liquid" has also been found to throw off the wet and render the wall less absorbent. Of course, the only effectual remedy would be to tile or slate-hang. The walls of gables should have been built hollow. When will architects and builders perceive this?—G. H. G.

[6440.]—**Hatch.**—I should prefer to make the door slide either in a hollow or on grooved fillets in the room. There should be another hatch on the serving-room side, so that it may be opened first and the dishes placed on a ledge before the inner hatch is opened. The method of finishing a hatchway must be left to the designer. It is, doubtless, the most pleasing feature that can be chosen, but whatever is done should be plain. A bold quarter-round run on the edge of openings, if it is visible, seems preferable to architrave members. There is a method of raising sliding sashes by means of a wheel, the teeth of which engage a rack on the edge of sash; but I forget the name of the inventor.—G. H. G.

[6442.]—**South Africa.**—Although this and the following questions relating to South Africa were not addressed to me, yet, with your sanction, I will venture to make a few remarks. In answer to "W. G. S." I must say that he stands about as good a chance of making money at the Cape in the architectural profession as any other adventurous speculator who would seek to do likewise by sending a cargo of warming-pans to the East Indies. In answer to "W. M. C.," I might add that every land-surveyor at the Cape who has passed the Government examination styles himself a Government surveyor, although they have nothing whatever to do for the Government. The only Government post that "W. M. C." would be likely to get if he were to go out would be as turnkey to H.M. prison at Kimberley, which desirable place is frequently vacant.—W. M.

[6448.]—**Drain Traps.**—Why should "Nemo" use a trap "formed of bricks and cement," and run the risks he fears? Professor Reynolds recommended such a trap about eight years ago, but knowledge and sanitary appliances have progressed since then, and "Nemo" can get fireclay traps which serve the purpose better than "brick traps." A built trap is also more liable to leakage of both water and air. "Nemo" should have said for what purpose he intended to apply the trap.—W.P.B.

[6451.]—**Local Board Surveyors.**—In reply to "W.," the fact of there being so many aspirants to the office of surveyor materially depreciates their services, and at the present day a salary of from £60 to £100 for a small town is considered fully adequate; and as to private practice, it is not in their power or knowledge to command one, this only being in the possession of fully qualified men.—S. W.

[5456.]—**Damp.**—If "Economy" would use Lincrusta-Walton, the Sunbury Wall Decoration, he would find it would at once answer his purpose, and save him the expense that he contemplates.—George Mason.

[6456.]—**Damp.**—The cheapest thing in the end for "Economy" to do is to cut out a course of bricks, above the ground-line, and insert the Broomhall Company's Patent Damp-proof and Ventilating Course. It is easily done, and in similar instances has proved successful.—C. A. G.

[6456.]—**Damp.**—I should recommend "Economy" to cut out the plaster where damp, and replaster with Parian cement, then put on some pitch paper, and re-paper the wall. I have had this done to my house, and think it will answer.—G. F. B.

CHIPS.

A new Roman Catholic school-chapel is being built at Halliwell, Bolton, dedicated to St. Joseph. The building consists of a schoolroom 66ft. by 32ft.; two class-rooms, one 24ft. by 15ft., and the other 19ft. by 15ft.; a chancel shut off by revolving shutters; vestry, 15ft. by 15ft.; lavatory, &c. The total cost, including seats, will not exceed £1,100. Mr. Herbert E. Tijou, of Manchester, is the architect, and the builder is Mr. John Roberts, of Thomas Holden-street, Bolton.

The chapel of Pembroke College, Cambridge was reopened by the Bishop of Ely on Friday, after enlargement to the east, under the supervision of Mr. George Gilbert Scott, M.A., F.S.A. The chapel is believed to be the first work ever carried out by Sir Christopher Wren, and was erected at the sole cost of Dr. Wren, Bishop of Ely, on his release after imprisonment between 1643 and 1660 without trial or sentence. Sir Christopher's stucco ceiling has been untouched, but the east wall has been taken down and rebuilt 17ft. further east, stone for stone. The new sanctuary is divided from the chapel by an arch of which the details are taken from St. Paul's Cathedral. The supporting columns are monoliths of Saravezza marble from the Apennines, near Spezzia, and stand brazen bases with a podium of Frosterley black marble. Messrs. Farmer and Brindley, of London, furnished the columns.

A course of four lectures is about to be delivered by Dr. Bristowe, medical officer of health for Camberwell, in the vestry-hall of that parish, on sanitary subjects.

PARLIAMENTARY NOTES.

Maintenance of Main Roads.—On Monday, in the House of Commons, in submitting a resolution, that it was expedient so to amend the Highway Act, 1878, that part of the maintenance of main roads might be defrayed from other sources than county rates, Mr. Harcourt pointed out that those roads were originally constructed for the benefit of all classes of the public; but that by the abolition of turnpikes a very large proportion of the community who used the roads were exempted from contributing towards their maintenance. The result was that the most unfair burden was thrown upon the rural parishes, while the municipalities escaped altogether. The hon. gentleman suggested, therefore, not that they should return to the old turnpike system, but that a moiety of cost of maintaining the main roads should in future be borne by the Consolidated Fund. Mr. Dodson regarded with apprehension the proposal to allow any class of the community to dip their hands into the Imperial Exchequer and take whatever they might think fit to expend on a matter that admitted of an indefinite extension. On a division the motion was negatived by 159 to 145, a majority of 14.

Fires in Theatres.—Mr. Macfarlane, on Tuesday, asked the Secretary for the Home Department if he could state that the safety of the public was secured in theatres and other places of public entertainment in case of fire; and, if not, if he could give any assurance that he would give the question his immediate attention.—Sir W. Harcourt.—I have communicated with the Lord Chamberlain on this subject, and he wishes it to be stated that, as far as the theatres licensed by him are concerned, he has caused the recommendations of the Select Committee of 1877 to be embodied as far as possible in the regulations issued by him for the guidance of managers. The theatres are inspected from time to time, and the managers are held responsible for the safety of the public. With regard to new theatres, the responsibility of framing regulations for adequate security from fires is imposed by the Metropolitan Buildings Act of 1878 on the Metropolitan Board of Works, whose printed regulations are open to inspection. I have addressed myself to the hon. member for Truro (Sir J. M'Garel-Hogg), and he has assured me that in all new theatres very stringent measures are taken to insure the escape of persons in the event of fire.

Open Spaces in London.—Mr. Walter James has introduced into the House of Commons a Bill providing further facilities for making open spaces in the metropolis available for exercise and recreation. Where any ground is placed under the care of trustees by some local or private Act of Parliament with a view to its being kept as a garden or open space, they are empowered by the Bill to transfer their interest in it, or its management, to a local authority to the end that it may be preserved for the enjoyment of the public. The local authority to which the transfer may, according to this scheme, be made, either for valuable consideration or by way of gift, is either the Metropolitan Board, the parish vestry, or the district Board. But before such transfer is made the Bill makes it necessary for a resolution in favour of it to be passed by a majority of two-thirds of the persons present at a special meeting of the trustees. Where, also, the owners or occupiers of houses round or near an open space have "rights of user" over it for exercise and recreation, the owner of the spot is authorised by the Bill to transfer it to one of the above-mentioned local authorities on trust for the enjoyment of the public, provided the consent be obtained of two-thirds of those present at a special meeting of the owners and occupiers interested. Power is also given by Bill to the owners of metropolitan burial-grounds in which there has been no interment since 1800 to transfer them to a local authority with a view to their being planted and laid out for the enjoyment of the public. With regard to consecrated ground, however, a faculty of the Bishop is made necessary for the exercise of any Board's or vestry's powers of management under the measure. In the city of London the Corporation is the local authority, to which it is proposed that open spaces may be thus transferred. Metropolitan commons, it may be noted, are expressly excluded from the operation of the measure.—In the House of Commons on Wednesday afternoon, Mr. W. H. James moved the second reading of the Metropolitan Open Spaces Act (1877) Amendment Bill, the object of which is to enable the Vestries or the Metropolitan Board of Works to take over, for the purposes of public recreation, and with the consent of two-thirds of the residents and of the ground landlord, all the squares and disused burial-grounds of the metropolitan area. Earl Percy moved its rejection; Sir A. Peel supported it. Mr. Courtney, on the part of the Government, assented to the second reading on the understanding that in Committee compensation clauses were introduced; and, after some observations from Mr. Warton and Sir E. Wilmot, Earl Percy deferred his opposition until a future stage, and the Bill was read a second time.

LEGAL INTELLIGENCE.

In re W. T. Nichols.—The debtor, who has presented a petition for liquidation, is a builder and brickmaker, carrying on business at East Dulwich and Brockley. His debts are estimated at about £13,000, and the assests show a considerable surplus subject to realisation. Upon the application of Mr. Edwin Hughes, the Registrar appointed Mr. Potter, architect and surveyor, Sevenoaks, to the office of receiver of the estate, and granted an injunction restraining two actions.

In re F. G. Helmore.—This was a first meeting in the bankruptcy of Frederick George Helmore, of 23, Leadenhall-street, architect and builder. The bankrupt recently filed a petition for liquidation, estimating his debts at about £12,000, but the proceedings have proved abortive. Numerous proofs were now admitted, and the creditors appointed Mr. J. Ford, accountant, 76, Cheapside, as trustee of the estate, together with a committee of inspection.

Client's Liability for Quantities. — At the Westminster County-court on Wednesday week a case of considerable importance to quantity surveyors was heard before the Judge (Mr. Bayley), involving the question of liability for the fees of a surveyor employed by an architect to take out the quantities of a building. The plaintiff was Mr. Henry Pafford Foster, of 5, John-street, Adelphi, surveyor, and the defendants were the Directors of the Southsea Pier Hotel Company; and the action was brought to recover the sum of £50, for work done. Mr. Williams, in opening the case, called the judge's attention to the decision in "Moore v. the Guardians of the Witney Union," which involved the very same question now sought to be raised. In 1878 the directors of the Southsea Pier Hotel Company instructed Mr. George Rake, architect, to make plans for the enlargement of the hotel. Whilst the plans were in course of preparation, they were altered in accordance with the wishes of the committee. The alterations having been finally approved, Mr. Rake employed the plaintiff (Mr. Foster) to take out the quantities, and they were lithographed and sent out to different builders. It turned out that no tender was accepted, and the plaintiff sent in his claim for the work done to the directors. They, however, alleged that there was no privity of contract between them and the plaintiff, and that he must look to Mr. Rake for payment, and this action had been brought to recover the amount. The original claim was £80, but it had been reduced to £50, in order to bring it within the jurisdiction of the Court.—Mr. Glynn, for the defence, contended that the decision of Chief-Justice Tyndall in "Moore v. the Witney Guardians" was an extraordinary mixture of law and fact, and did not bear the construction sought to be put on it. It was true there was a usage that the cost of taking out the quantities should be paid by the builders, but there was no provision that in the event of the building not being proceeded with that the parties employing the architect were liable for the amount.—His Honour said the decision clearly implied that an architect was authorised to employ a competent surveyor.—The plaintiff proved having been instructed by Mr. George Rake to take out the quantities; and his evidence was corroborated by Mr. Rake, who said that the taking out of quantities was no part of the duties of an architect occupying any position in his profession. In the event of the work being carried out, the usage was to include the fee in the builder's estimate.—His Honour said it had been clearly proved to his satisfaction in two recent actions heard in his Court that this was the usage of the trade, whether there was any competition or not; and that an architect was justified in instructing a competent surveyor to take out the quantities. Assuming the services of a competent surveyor to be necessary, the cost must ultimately fall on the employers.—Mr. Rake, cross-examined, said that various additions were made from time to time to the proposed buildings, at the suggestion of the sub-committee and secretary, including an additional story and three large bay windows.—Re-examined: In no respect did the plans exceed his instructions. He merely introduced modifications suggested by the directors. Mr. Alderman John Baker, one of the directors of the company, was called for the defence, and said the directors handed the original plans to Mr. Rake, and intimated to him that the outlay contemplated by the directors was about £1,500. It was afterwards proposed to add another story, at a cost of £500, making the total £2,000. He also intimated to Mr. Rake the opinion of the directors that as they had already paid £50 for the plans he should charge a reduced fee, which he consented to do. The reason why the work was not proceeded with was that the tenders were

largely in excess of the amount contemplated by the directors. Cross-examined: He did not recognise Mr. Foster in the matter at all. Mr. E. T. Stehelin, secretary of the company, in cross-examination said, there was no minute on his books expressing dissatisfaction with Mr. Rake on the ground that the tenders were in excess of the estimates. His Honour said he could not see how the plaintiff could be affected by any instructions given to the architect. Judgment would be for the plaintiff, for the full amount, with costs, to be taxed by the Registrar.

"Surface Concrete."—Case under Metropolitan Building Act.—At the Hammersmith Police-court, on the 18th inst., Mr. J. Brown appeared before Mr. Paget, in answer to a summons which had been taken out by Mr. Knightley, district surveyor for Hammersmith, to show why he had not covered the surfaces of sites of six houses in Brackenbury-road, with 6in. of "good concrete," as required by the by-laws under the Metropolitan Building Acts, 1855 and 1878. The defendant was represented by Mr. Kisch, solicitor, and alleged that the work was already done. Mr. Knightley called his assistant, Mr. W. Holditch Stevens, to disprove this. Witness said that about the 12th Feb. the ground-surface beneath one of the back rooms was done as a specimen, and the material was approved, but the remaining sites were either not covered at all, or merely with loose brick rubbish or burnt ballast with a deficiency of lime. Although the defendant several times promised attention, the floor-boards were ultimately laid without regard to this promise; and further means of inspection were at an end. A witness was called for the defence, who said he had mixed the concrete, and could use as much lime as he pleased, admitting that in some places the said concrete was not six inches but four inches in thickness. Mr. Paget said even this would be wrong, and asked why, if the concreting had been done at all the floor-boards had been nailed down to prevent the district surveyor from seeing it? He made an order as prayed, the work to be carried out within 7 days. Defendant to pay costs.

A Sewerage Contract.—The case of Pattinson v. the Lichfield Corporation reached its final stage last week on an appeal in the Exchequer Court. It was an action brought by contractors, Messrs. John and Robert Pattinson, to recover the sum of £3,491 19s. 1d. for work, labour, and materials supplied in connection with the Lichfield sewerage works, and for breach of contract, and it was ordered for trial at the recent Stafford Assizes, but by arrangement was referred to arbitration, when the action—which originally contained the name of Mr. Robert Griffith, the city engineer, as joint defendant—was amended to its present form, with the Corporation as sole defendants. The arbitrator (Mr. Spruce, engineer, of Tamworth) made an award in favour of plaintiffs, and found that the Corporation were indebted to plaintiffs in the sum of £1,382 13s. 2d. for work done, and the additional sum of £1,006 4s. 8d. for damages, recording an award for a total sum of £2,338 17s. 10d., with costs. Against this award the Corporation appealed to the Exchequer Court, on the ground that the arbitrator had found for the plaintiffs for a sum outside the contract, made in writing and sealed by the sanitary authority, and so had, under the provisions of Section 174 of the Public Health Act, 1875, invalidated the award. The court considered sufficient reason had not been shown which would justify them in setting aside the award, and therefore dismissed the appeal, with costs against the appellants.

Heavy Failure in Manchester.—A petition for liquidation has been filed in the Manchester County-court on behalf of Matthias Seanor, of 1, Police-street, Manchester, architect, by Messrs. Hall, Son, and Lord, solicitors. The liabilities are estimated at £79,200. A local paper states that this failure has been caused by the debtor's connection, as a director, with a Manchester building society, in which capacity he, along with his co-directors, signed promissory notes for loans to the society to a considerable amount. The debtor's connection with the society, moreover, ceased upwards of six years ago, and his position is one for which much sympathy is felt.

Defective Mortar.—Frederick Corrick, of Annesley-road, Upper Holloway, builder, was summoned at Marylebone on Wednesday, before Mr. De Rutzen, by the Metropolitan Board of Works, for using defective mortar and concrete in some houses erected by him in Chester-road, St. Pancras. Mr. Burton, solicitor, appeared for the Board; and Mr. Freeman for the defendant. Mr. A. Bovill, district surveyor for St. Pancras, on being called, stated he had given the defendant the statutory notice to remove the footings in the foundations and the defective mortar, but nothing had been done. The mortar was very bad, and the footings composed of soft bricks. He summoned the defendant for that offence, and he was fined 40s. and costs in each case. Mr. Freeman, for the defence, contended that the defendant could not be summoned twice for the same offence, and that the Board had allowed the matter to stand over for a long time. Mr. De Rutzen stated that he should make an order to alter, vary, or remove the defective work: but, at the defendant's request, he adjourned the matter for a week.

CHIPS.

It is announced in Tuesday's *Gazette* that Messrs. Tomlinson and Cowdell, of Coventry and Leicester, architects, have dissolved partnership.

Mr. J. D. Prior, the new inspector of factories, and late secretary of the Amalgamated Carpenters' Society, has this week been appointed by the Home Secretary to the Birmingham district.

The town council of Tenterden are at issue with Mr. Warrington, the contractor who recently rebuilt the town-hall, as to his charges for extras. The matter was discussed last week, when a committee was authorised to offer a settlement, and, if not accepted, to arrange for arbitration.

At a meeting of heritors, held at Kirkintilloch, N.B., on Saturday, plans by Mr. Kinnear, architect, were adopted, by a majority of those voting, for the erection of a new manse, at an estimated cost of £1,430.

The new cemetery at Horsham was consecrated by the Bishop of Chichester on Tuesday. It is situate in Dennes-road, and has been laid out, and the buildings constructed from plans by, and under the supervision of Mr. T. Skinner, of Horsham. Mr. Etheridge took the contract for chapels, entrance-lodge, walls, gates, &c., and that for paths and drainage was taken by Mr. David Mitchell.

The University of Edinburgh resolved on Saturday to confer the degree of LL.D., on Sir Daniel Macnee, President of the Royal Scottish Academy, and the ceremonial presentation will take place on Wednesday, the 20th prox.

At the Birmingham police-court, on Tuesday, James Lewin, described as a builder, of Sun-street, Nottingham, and his wife were convicted on a charge of having obtained furniture valued at £20 by false pretences, and were sentenced, the man to six months' and the woman to two months' imprisonment with hard labour.

A new font has just been placed in Holy Trinity Church, Richmond, Surrey. It is of Devonshire marble, and cost £70. Mr. Luck was the architect, and Mr. William Collings, of Richmond, executed the work.

The corporation of Doncaster are about to erect a new gas-holder and tank at their gas-works in the Holmes, in accordance with designs prepared by Mr. R. Bridge, their engineer. The holder will be 152ft. 6in. in diameter, and 27ft. deep.

A new reredos of carved oak, with painted panels, is being placed in the parish-church of Wickham Market, East Suffolk, by Messrs. Cox, Sons, Buckley, and Co., of Southampton-street, Strand. The same firm are carrying out decorations in the chancel of this church, including the panelling and colour and gilding treatment of the ceiling and eastern wall.

The town council of Hereford have purchased an estate near that town known as Eign's-farm, and have determined, instead of emptying the sewage of the city into the River Wye, to convert the newly-acquired property into a sewage-farm. Mr. Harpur, C.E., of Merthyr Tydfil, has been appointed engineer for carrying out the undertaking.

A new Wesleyan chapel is about to be built in Upper Richmond-road, Putney, from the designs of Mr. J. Weir.

Extensive works of sewage-disposal by land irrigation are approaching completion at Worksop under the supervision of Mr. Alsop, surveyor to the local board, and will be opened in about two months' time. The total cost will be about £15,000, and the contract for brickwork and masonry had been taken by Mr. Bullen.

A group of industrial schools, erected for the Chesterfield Board of Guardians in Ashgate-road was opened on Friday. The works have been executed in three contracts, viz.:—No. 1, for the building, Mr. T. Tutin, Nottingham; No. 2, for the outbuildings, Mr. Margereson, Barlow; and No. 3, for the fittings, Mr. Johnson, Mansfield; from the designs and under the supervision of Messrs. Rollinson and Son, architects, of Chesterfield. The total cost has been about £12,500.

A new police-station is about to be built at Mold, Flintshire, from the plans of Mr. T. M. Lockwood, architect, of Chester.

Mr. B. Thomas, of Somerton, near Taunton, has been elected surveyor to the Faversham rural sanitary authority at a salary of £250 per annum.

Our Office Table.

"When the Corporation of London," says the *Athenæum*, "desires to erect another 'memorial,' and, taught by experience, avoids procuring a griffin, it should employ French sculptors. The griffin at Temple Bar has cost more than £1,000. They do these things better in France; for instance, the following sculptors of note, employed to execute, for the interior of the Hôtel de Ville, statues of men, not griffins, are to be paid as follows:—M. Falguière, for a marble statue, 12,000fr.; M. Carrier-Belleuse, six console terms, 2,000fr. each; MM. Cain and Jacquemart, each, for two lions for the façade of the Place Lobau, 12,000fr.; M. Felon, for a 'Fame,' 4,000fr.; M. Guillaume himself for two terms in marble for the Grande Salle à Manger, 24,000fr." Probably the choice of sculptors in France is determined by merit and not by Royal selection.

Mr. John Prescott Knight, R.A., who for a period of a quarter of a century was secretary to the Royal Academy, died at his residence at Maida Hill on Saturday, at the age of seventy-eight. The deceased gentleman, the son of a once famous comedian, was born at Stafford in 1803, and was intended by his father for a commercial career. With this view he accepted a position as clerk in a West India merchant's office in Mark-lane, but the failure of the firm necessitated an alteration in his career. He had already given proof of some taste for drawing, and became the pupil of two artists. Under most adverse circumstances he began to exhibit portraits at the Royal Academy. In 1836 he was elected an Associate, was admitted to the full honours of the Academy in 1846, and was appointed Secretary to the Forty before his two years' service of member of Council had expired. This position he held until 1873, when, owing to advancing years, he resigned. The Council, in consideration of his lengthened and valuable services, awarded him a pension equivalent to his former salary.

The meetings of the Institution of Naval Architects will be held on April 6, 7, and 8, and the list of papers is a formidable one. There are no fewer than sixteen on the theory and practice of naval architecture and on marine engineering; and four on a subject which is exciting much attention—viz., the use of mild steel as a material for the construction of ships, boilers, and parts of machinery. Mr. Samuda will deal with the application of steel to the construction of war-ships. Mr. W. Parker, of Lloyd's, will report on the failure of the original steel plates used in the boilers of the *Livadia*; M. Berrier Fontaine will give an account of the experience of the French dockyards in the use of mild steel for shipbuilding; and Mr. J. R. Ravenhill will read a paper on the increasing use of steel for shipbuilding and marine engineering. Of the papers on theoretical naval architecture, Mr. W. H. White, of the Admiralty, will contribute two. Mr. R. E. Froude will deal with a subject with which his late father's name was identified—viz., the leading phenomena of the wave-making resistance of ships; and Mr. W. John, of Lloyd's, will read a paper on grain cargoes.

A new use of our public schools is about to be made by the vicar of St. Jude's, Whitechapel, with the view of introducing art culture amongst the humbler classes. During Easter week a fine art exhibition is to be opened in the schoolroom of the vicarage. Paintings by Sir F. Leighton, Mr. Watts, and other artists, and a large collection of embroidery and pottery, will be on show. It is intended that every article shall bear on it such a description as will arouse the spectators' interest. The idea is one which the managers of other schools are about to adopt, as it will open a new branch of educational agencies. The School Board authorities are to be interviewed on the subject, and large and generous offers of articles for exhibition have been made by artists and others.

Epps's Cocoa.—Grateful and Comforting.—"By a thorough knowledge of the natural laws which govern the operations of digestion and nutrition, and by a careful application of the fine properties of well-selected Cocoa, Mr. Epps has provided our breakfast tables with a delicately flavoured beverage which may save us many doctors' bills. It is by the judicious use of such articles of diet that a constitution may be gradually built up until strong enough to resist every tendency to disease. Hundreds of subtle maladies are floating around us ready to attack wherever there is a weak point. We may escape many a fatal shaft by keeping ourselves well fortified with pure blood and a properly nourished frame."—*Civil Service Gazette*.—Sold only in Packets labelled—"James Epps and Co., Homœopathic Chemists London."—Also makers of Epps's Chocolate Essence for afternoons

Mr. Richard Shaw, builder, of Scarborough, committed suicide on Thursday in last week by hanging himself from a beam in his workshop.

At a general meeting of the Society of Painters in Water Colours, held on the 28th inst., Professor Adolph Mengel, of Berlin, was elected an honorary member, and Messrs. George du Maurier and Wilmot Pilsbury were elected associate exhibitors.

Mr. A. H. Parker, architect, and pupil of Mr. H. Rowe, the county surveyor, has just been appointed surveyor to the newly formed local board of Blaines, a populous district lying outside the municipal boundary of the city of Worcester.

So rapid has been the rise in the number of scholars at the Queen Elizabeth Grammar School, Darlington, since the erection of the new building some three or four years ago, at a cost of about £14,000, that it is now found to be imperative to erect a large new class-room wing; this annex, like the original building, will be carried out from plans prepared by Mr. G. G. Hoskins, F.R.I.B.A., the Governors' architect.

EXAMINATION UNDER THE METROPOLITAN BUILDING ACT, 18 and 19 Vict., cap. 122, Sect. XXXIII.—The Board of Examiners appointed by the Royal Institute of British Architects to examine all persons presenting themselves for the purpose, as to their competency to perform the duties of District Surveyor in London, and to grant Certificates to Candidates deserving of the same, will hold an Examination on the 28th and 29th inst. Each Candidate must, on or before Friday, the 22nd inst, send to the Secretaries an application, which must be accompanied by a Statement, drawn according to a form to be previously obtained from them, and each Candidate will then be required to attend at the Institute on Thursday, the 28th inst., from 10 a.m. until 1 p.m., and from 2 p.m. until 5 p.m., for the written and graphic Examination; and on Friday, the 29th inst., at 12 noon, for the oral Examination. Each Candidate, on sending in his formal statement and application must pay to the Institute a fee of two guineas, and each Candidate, on receiving his certificate, should the same be granted to him, must pay to the Institute a further sum of three guineas.

FINAL VOLUNTARY ARCHITECTURAL EXAMINATION, JUNE, 1881.—An Examination will be held, under the auspices of the Board of Examiners recently appointed by the Council, on the 14th, 15th, 16th, and 17th June, 1881. All NEW CANDIDATES will be required to go through the Examination as a whole, in both the Scientific and Artistic Sections; but those Gentlemen who have previously passed in one section will be permitted to offer themselves for Examination in the other Section. Each Candidate must, on or before Saturday, the 30th inst., send to the Secretaries an application, which must be accompanied by a statement drawn according to a form to be previously obtained from them; and each candidate, on sending in his formal application and the required probationary work, must pay to the Institute a fee of four guineas.

EXAMINATION UNDER BY-LAW XIV., MARCH, 1882.—The first Obligatory Examination for Membership will be held in the month of March, 1882, under the auspices of the Board of Examiners recently constituted by the Council.

THE NOVEMBER BALLOT.—Candidates for Membership are reminded that gentlemen desirous of being in time for the Ballot to be held on the FIRST MONDAY IN NOVEMBER, must send in their papers on or before SATURDAY, the 23rd inst., as the nomination of Candidates for the November Ballot must be made at the Eleventh Ordinary Meeting, to be held on the 25th inst.

J. MACVICAR ANDERSON, Hon. Sec.
WILLIAM H. WHITE, Secretary.
Royal Institute of British Architects, 9, Conduit-street, Hanover square, London, W.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Society of Arts. "The Art of Lace-Making." By A. S. Cole. 8 p.m.
Institution of Surveyors. Adjourned discussion on paper by H. H. Collins on "Sanitation as an important Increment of Value in House Property." 8 p.m.
Society of Engineers. 8 p.m.

TUESDAY.—Institution of Civil Engineers. "The Actual Lateral Pressure of Earthwork." By B. Baker, M.I.C.E. 8 p.m.
Society of Arts. "Canada: the Old Colony and the New Dominion." By E. Hepple Hall. 8 p.m.

WEDNESDAY.—Society of Arts. "The Discrimination and Artistic Use of Precious Stones." By Prof. A. H. Church. 8 p.m.
British Archæological Association. "The Roman Mosaics at Brading." By Thomas Morgan, F.S.A. "The Norman Cathedral at Bath Discovered, the Repairs in 1869." By J. F. Irvine. 8 p.m.

THURSDAY.—Royal Institution. "Ornament." By H. H. Statham. 3 p.m.
Builders' Clerks' Benevolent Institution. Annual Dinner at the Guildhall Tavern, Gresham-street, E.C. 6 for 6.30 p.m.
Civil and Mechanical Engineers' Society. "Rainfall." By B. Haughton. 7 p.m.

FRIDAY.—Royal Institution. "The Conversion of Heat into Sound." By Prof. Tyndall, F.R.S. 9 p.m.

Lamplough's Pyretic Saline is refreshing, most agreeable, and the preventive of FEVERS, BILIOUSNESS, SMALL POX, SKIN DISEASES, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill. *Use no substitute.*—[ADVT.]

Holloway's Pills are admirably adapted for strengthening debilitated and nervous constitutions. Weak digestive organs are invigorated and poor blood enriched by this purifying medicine. The most delicate may take it without apprehension, the most timid need have no fear. The balsamic nature of Holloway's Pills guarantees their strengthening powers.

Trade News.

WAGES MOVEMENTS.

BERWICK-ON-TWEED.—The painters in this town struck work on Monday in consequence of the refusal of the masters to raise their wages to the old level, 7d. per hour. This sum was paid till the beginning of the winter, when it was reduced to 6d. per hour, and the men now state that trade has so revived as to justify a return to the old rate of pay.

STRANRAER.—The masons in Stranraer have this week struck work for an advance of an additional halfpenny per hour on the sum paid during the past 12 months—viz., 5d.

CINDER-SIFTING ASH CLOSETS
Superior to Earth Closets. For Gentlemen's Houses, Cottages, Schools, &c.
NO DRIED EARTH REQUIRED.
The Sanitary Appliance Co. (Ltd.), Salford.

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CHARLES TRASK,
Norton-sub-Hamdon, Ilminster, Somerset.
—[ADVT.]

McLACHLAN & SONS, 35, St. James's-street, S.W. Builders, Decorators, and House Painters. Designs and Estimates.
General Repairs and Alterations Executed.
Experienced Workmen always in readiness, and sent to any part of the country.—[ADVT.]

BATH STONE.
BOX GROUND,
THE BEST FOR ALL EXTERNAL USE.
CORSHAM DOWN
CANNOT BE SURPASSED IN BEAUTY OF APPEARANCE FOR INTERIOR WORK.
PICTOR & SONS, BOX, WILTS.
(See trade advt. on p. XXV.) [ADVT.]

TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender—it adds to the value of the information.

ANERLEY, S.E.—For the erection of a detached villa, Anerley Park, for C. Rolls, Esq. Mr. R. Cruwys, architect, Bank Chambers, 451, Brixton-road, S.W. Quantities supplied:—

Wootton, Penge	...	...	£1,419	0 0
Candler, Brixton	...	...	1,350	0 0
Rice, Clapham	...	...	1,346	0 0
Huxtable, Anerley	...	...	1,282	0 0
Simons, Brixton	...	...	1,257	0 0
Richardson, Clapham*	...	...	1,167	0 0
Pack, Brixton	...	...	1,165	0 0
Macey, Brixton	...	...	1,150	0 0

*Accepted at £1,150.

BATTERSEA.—For rebuilding the "The Prince's Head" publichouse, and erecting three shops in York-road, Battersea, and stabling in rear, for Messrs. Sansom and Curington. Mr. H. I. Newton, architect, 27, Gt. George-street, Westminster. Quantities supplied:—

Walker	...	...	£6,070	0 0
Taylor	...	...	5,920	0 0
Grimwood and Son	...	...	5,895	0 0
Shurmur	...	...	5,868	0 0
Langmead and Way	...	...	5,765	0 0
Godden	...	...	5,715	0 0
Lamble	...	...	5,679	0 0
Mattock, Bros.	...	...	5,333	0 0
Burman	...	...	5,207	0 0
Cooper	...	...	4,995	0 0
Gill	...	...	4,987	0 0
Pickersgill	...	...	4,944	0 0

BRIXTON.—For new road and sewer, Heathfield Estate, under the superintendence of Mr. Wm. Eve, 10, Union-court, Old Broad-street:—

Bell	...	...	£386	0 0
Porter	...	...	325	0 0
Potter	...	...	315	0 0
Pizzey	...	...	296	15 0
Harris	...	...	272	0 0
Mayo, 297, Brixton-road (accepted)			260	17 0

BRIXTON.—For new roads and sewer, Loats-road, for Mr. John Loat, under the superintendence of Mr. Wm. Eve, 10, Union-court, Old Broad-street, E.C.:—

Bell	...	...	£892	0 0
Porter	...	...	816	0 0
Potter	...	...	753	0 0
Pizzey	...	...	594	10 0
Harris	...	...	578	0 0
Mayo	...	...	510	15 0

BURWASH.—For dairy, lodge-entrance, and model cottages, for J. C. Schroeter, Esq, Laurelhurst, Burwash, Sussex. Mr. Joseph S. Moye, architect:—

Dairy and Lodge-entrance:—				
Dray, T., Burwash	...	...	£709	18 6
Waterhouse, S. (accepted)	...	...	597	15 0
Cottages:—				
Dray, T., Burwash	...	...	£436	18 6
Waterhouse, S., Burwash (accepted)			398	0 0

BROMSGROVE.—For villa residence, New-road, Bromsgrove, for Miss Auster. Mr. John Cotton, architect, Birmingham and Bromsgrove. Quantities supplied:—

Smith, B. N., Birmingham	...	...	£850	0 0
Bates, Birmingham	...	...	825	0 0
Archer, Birmingham	...	...	809	9 0
Loughton, Birmingham	...	...	780	0 0
Read and Cook, Bromsgrove	...		780	0 0
Love and Flint, Dudley	...	...	775	0 0
Tilt and Fisher, Bromsgrove	...		774	10 0
Bradney and Co., Wolverhampton			760	0 0
Woodward, Birmingham	...	...	751	9 0
Inwood, Malvern	...	...	741	0 0
Feltham, Birmingham	...	...	717	0 0
Brazier and Weaver, Bromsgrove*			684	10 0
Walton, Smethwick	...	...	667	0 0

* Accepted.

BROMSGROVE.—For a residence at Dodford, near Bromsgrove, for George Cole, Esq. Mr. John Cotton, architect, Birmingham and Bromsgrove. Quantities supplied:—

Jones and Son, Birmingham	...		£1,390	0 0
Redding, Oldbury	...	...	1,365	0 0
Hancox, Birmingham	...	...	1,322	0 0
Bates, Birmingham	...	...	1,085	0 0
Taylor, Birmingham	...	...	1,031	10 0
Inwood, Malvern	...	...	1,025	0 0
Brazier and Weaver, Bromsgrove			1,017	15 0
Tilt and Fisher, Bromsgrove	...		1,008	12 0
Cook and Read, Bromsgrove	...		1,000	0 0
After revision:—				
Tilt and Fisher	...	...	1,000	0 0
Cook and Read	...	...	970	0 0
Brazier and Weaver (accepted)	...		963	0 0

CAMDEN TOWN. For building a pianoforte factory at the rear of No. 103, Park-street, Camden Town, for Mr. G. Ajello. Mr. James Robert Furniss, architect. Quantities supplied by the architect:—

Bamford and Son	...	...	£4,550	0 0
Augood	...	...	4,100	0 0
Wall, Bros.	...	...	4,096	0 0
Kerry	...	...	4,000	0 0
Macfarlane	...	...	3,917	0 0
Edgar	...	...	3,899	0 0
Mattock, Bros.	...	...	3,793	0 0
Pickersgill	...	...	3,731	0 0
Lamble	...	...	3,730	0 0
Toms	...	...	3,576	0 0
Steed, Bros.	...	...	3,395	0 0
Boden	...	...	3,328	10 0
Gould and Brand	...	...	3,198	0 0
Anley	...	...	3,170	0 0
White (accepted)	...	...	3,138	0 0

CHELSEA.—For erecting new hospital for women, Fulham-road, Chelsea, S.W. Mr. J. T. Smith, architect. Quantities by Messrs. Hunt and Steward:—

Holland and Hannen	...	...	£12,380	0 0
Patrick and Sons	...	...	12,100	0 0
Trollope	...	...	11,893	0 0
Simpson and Son	...	...	11,150	0 0
Braid and Co.	...	...	11,000	0 0
Conder	...	...	10,934	0 0
Perro	...	...	10,876	0 0
Shaw	...	...	10,548	0 0
Higgs and Hill	...	...	10,480	0 0

COLCHESTER.—For erecting two houses in Crouch-street, Colchester, for Mr. T. Ward Watson. Mr. Horace Darken, of Colchester, architect:—

Everitt and Son	...	...	£1,399	0 0
Wiles, Geo.,	...	...	1,333	0 0
Chambers, A. J.	...	...	1,300	0 0
Dupont, F.,	...	...	1,275	0 0
Oldridge, C. H. (accepted),	...		1,260	0 0

CROYDON.—For tar-paving at Beulah-road playgrounds, for the Croydon School Board:—

Lake (accepted)	...	...	£280	0 0

HALIFAX.—For the erection of a Higher Board School, for the Halifax School Board. Mr. Richard Horsfall, of Halifax, architect. Accepted tenders:—

Masonry: Firth and Son.
Carpentry: Smith, J.
Plastering: Rushworth and Firth.
Plumbing: Stafford, R. P.
Ironwork: Taylor and Parsons.
Painting: Marshall, T.

Total amount of accepted tenders, £5,821 18s.; cost of school, including purchase of site, furniture, &c., £11,000.

HASTINGS.—For the erection of two houses, for E. W. Stubbs, Esq. Messrs. F. and J. Plowman, architects, Hastings:—

Vidler	...	...	£775	0 0
Lambert	...	...	686	0 0
Ditch	...	...	660	0 0
Phillips	...	...	615	0 0
Woodall	...	...	567	0 0
Starr, Bros., Hastings (accepted)	...		534	10 0

HOLBECK.—For infirmary and alterations to main building at the Holbeck Union Workhouse. Mr. Wm. Hill, F.R.I.B.A., Leeds, architect. Quantities by Messrs. Hoffmann Wood and Lindley Oldroyd, both of Leeds:—

Brick and mason's work:—				
Myers, C.,	...	...	£4,495	0 0
Joiner's work:—				
Pinder, Wm.,	...	...	2,160	0 0
Plumber's work:—				
Ellis, J.,	...	...	720	0 0
Plasterer's work:—				
Orange, H.,	...	...	190	0 0
Slater's work:—				
Sharp and Harper	...	...	410	0 0
Painters' work:—				
Robinson, J.	...	...	120	0 0
Total	...		£8,095	0 0

ILFRACOMBE.—For additions to Twitchen House, Morthoe, near Ilfracombe, for Dr. G. B. Longstaff. Mr. Edward Burgess, architect. Quantities by Mr. W. Thornicraft:—

Hookway, Bideford	...	...	£4,998	0 0

Kent.—For finishing three houses at Sidcup, for George H. Tatham, Esq. Messrs. Ebbetts and Cobb, architects, Savoy House, 115, Strand:—

Lidstone and Son	£856	0	0
Pocock, J.	795	0	0
Went and Perkins	539	0	0
Knight, T.	495	0	0
Williamson (accepted)	375	0	0

Leicester.—For new Memorial-hall, Archdeacon-lane, Leicester, for Mr. Thomas Cook. Mr. Edward Burgess, architect; Quantities by Mr. W. Thornicraft:—

Herbert, T. and H.	£6,150	0	0
Kellett	5,960	0	0
Hutchinson, J., and Son	5,947	0	0
Bass	5,899	15	10
Major	5,835	0	0
Clark and Garrett	5,696	0	0

Leighton Buzzard.—For the repair and decoration of the corn exchange. Mr. Gotto, architect:—

Gibbs, T.	£100	0	0
Webb, T.	99	10	0
Purser, J. and R.	92	0	0
Tutt, J. (accepted)	89	0	0

London.—For new counting-house, &c., Leadenhall-street, for J. T. Morton, Esq., under the superintendence of Mr. Wm. Eve, 10, Union-court, Old Broad-street, E.C.:—

Lascelles	£349	10	0
Salt	265	0	0
Heiser	252	0	0
Harris and Wardrop	221	0	0
Wilson and Exton	219	0	0

Midhurst.—For the erection of a public hall and assembly room, for a limited liability company. Mr. Buck, of Horsham, architect:—
Sharpe, Horsham (accepted).

Monkton Combe, Somersetshire.—For new north aisle to the parish-church. Mr. E. H. Lingen Barker, architect:—

Gay, E. (accepted)	£480	0	0

Nottingham.—For hosiery warehouse in Castlegate, Nottingham, for Messrs. C. and F. Sudbury (exclusive of foundations and basement story, which were previously done by "measure and value"). Messrs. S. Dutton Walker and Howitt, architects. Quantities supplied:—

Marriott and Wartnaby	£6,326	10	0
Crookes, Foster, and Co.	6,173	0	0
Jelley	5,929	0	0
Hodson and Facon	5,750	0	0
Clarke	5,672	0	0
Hickling	5,620	0	0
Hind	5,497	0	0
Henshaw	5,423	0	0
Bell and Son	5,417	0	0
Vickers	5,395	0	0
Messom	5,393	0	0
Wooll, Bros.	5,380	0	0
Wheatley and Maule	5,150	0	0
Scott	5,050	0	0
Lynam, Nottingham (accepted)	4,990	0	0

Patricroft.—For constructing a disinfecting stove at the workhouse, Patricroft, for the guardians of the Barton-upon-Irwell union. Mr. John Price, A.M.I.C.E., engineer:—

For the building:—			
Williams, G., Flixton	£69	0	0
Moore, T. and Sons, Eccles	65	0	0
Davidson, J. M., Urmston	63	10	0
Brooks, N. and Son, Patricroft	56	10	0
Haigh, J., Urmston (accepted)	50	10	0
For the ironwork:—			
Fletcher, J. and Sons, Salford	52	0	0
Execs. of J. D. Leigh, Patricroft*	47	10	0

* Accepted.
(Engineer's estimate for the whole, £120.)

Peckham, S.E.—For repairs to houses in Bell Garden-road, for F. J. Purssord, Esq. Mr. R. Cruwys, architect, Bank Chambers, 451, Brixton-road, S.W.

Smart, Brixton (accepted)	£115	0	0

Putney Hill.—For the erection of a house on Putney Hill, for Jno. Bonthron, Esq. Mr. J. T. Wimperis, architect. Quantities by Mr. J. G. Hilton:—

Aldin and Son	£5,178	0	0
Brass	4,980	0	0
Thorne	4,930	0	0
Fish	4,889	0	0
Patrick and Son	4,428	0	0
Aries, S. W.	4,068	0	0
Adamson and Sons	3,987	0	0
Scrivener, Regent's-pk. (accepted)	3,907	0	0

Redditch.—For sewering the district for the local board. Messrs. Gotto and Beesley, of Westminster, engineers:—

Laws (accepted)	£7,051	0	0

Scarborough.—For new premises in Westborough, Scarborough, for Messrs. Rowntree, Sons, and Co. Mr. Edward Burgess, architect. Quantities by Mr. W. Thornicraft:—

Walton, E.	£16,151	3	2½
Bastimann, J., and Sons	14,525	17	2
Foster, J.	14,047	3	7
Thorp, J. H.	13,635	15	0
Bellerby, W.	13,464	6	0
Horner, F.	13,111	15	0
Coates, J.	13,064	9	2½
Malton, W. E.	12,622	8	4½
Barry, J.	12,577	0	0
Petch and Fox	12,326	4	0
Peacock, W.	12,316	2	0
Spencer, A. and Co.	12,268	8	0
Padbury, J., and Son	12,165	1	2
Jaram, J.	12,104	0	0
Mansfield, G.	11,978	2	0
Bland, J.	11,934	0	0
Leake, R.	11,897	0	0
Posgate, L.	11,863	11	7
Jowsey, W.	11,787	0	0
Dennison, W.	11,738	18	0
Scales, G.	11,520	0	0

Smethwick.—For the erection of new schools, Hough-lane, Smethwick, for the Harborne School Board. Messrs. J. P. Sharp and Co., architects, Birmingham. Quantities supplied:—

Garlick, J., Birmingham	£2,840	0	0
Whitehouse & Jones, B'mingham	2,512	0	0
Whitehouse, D., Smethwick	2,494	0	0
Sapcote and Sons, Birmingham	2,492	0	0
Smith, H. & Son, West Bromwich	2,465	0	0
Bowen, J., Birmingham	2,450	0	0
Harley and Son, Smethwick	2,330	0	0
Jeffery and Son, Birmingham	2,290	0	0
Walton, E., Smethwick	2,249	0	0
Stockton and Son, Oldbury	2,239	0	0
Bennett, W. T., Birmingham*	2,185	0	0

* Accepted.

Smethwick.—For additions to Brasshouse-lane schools, Smethwick, for the Harborne School Board. Messrs. J. P. Sharp and Co., architects. Quantities supplied:—

Garlick, J.	£1,850	0	0
Whitehouse, W.	1,678	0	0
Bowen, J.	1,460	0	0
Whitehouse and Jones	1,450	0	0
Stockton and Son	1,449	0	0
Harley and Son	1,430	0	0
Sapcote and Sons	1,396	0	0
Bennett, W. T.	1,391	0	0
Jeffery and Son	1,344	0	0
Walton, E.	1,331	0	0
Smith, H. and Son (accepted)	1,322	0	0

Somers Town.—For part rebuilding Nos. 1 and 2, Chapel-street, Somers Town, for Mr. J. W. Jones. Messrs. John Saville and Son, architects, 1, Argyle-square. Quantities supplied:—

Fawkes, O.	£1,390	0	0
Emery, J.	1,350	0	0
Temple and Forster	1,290	0	0
Cave, C.	1,250	0	0
Hawkins, T.	1,099	0	0
Beale, J.	1,040	0	0
Wall, Bros.	998	0	0
Auley, J.	980	0	0
Royal, W. (accepted)	966	0	0

Somers Town.—For cabinet and bar fittings at "The Coffee House," Chalton-street, Somers Town, for Mr. Charles Brown. Messrs. J. Saville and Son, architects. Quantities supplied:—

Braid and Co.	£380	0	0
Schlater, N.	315	0	0
Temple and Forster	300	0	0
Royal, W.	307	0	0
Loaring, S.	286	5	0
Auley, J.	287	0	0
Emery, J. (accepted)	277	16	0
Pewterer's work for ditto:—			
Warne, J.	183	0	0
Grimes, G.	155	0	0
Watts and Co.	148	14	6
Paddon, W., junr.	147	0	0
Warne, H. T.	146	0	0

Southampton.—For new premises, at S. W. corner of North Front and St. Mary's-street. Mr. Arthur Martin, architect:—

Rowland (accepted)	£316	15	0

Stratford-on-Avon.—For alterations and additions to Rowley House, Stratford-upon-Avon, for Mr. H. W. Newton. Mr. Joseph Lattimer, architect. Quantities by the architect:—

Roberts and Sons	£1,425	0	0
Callaway, J.	1,180	0	0
Price and Son	1,152	0	0
Wilkinson, T.	1,091	0	0
Compton, J.	1,030	0	0
Cox and Kings	1,000	0	0
Girling, W.	997	8	0
Whateley, G. (accepted)	917	0	0

Stroud, Glos.—For scavenging the town for three years, for the local board:—

	Per Year.		
Lawrence	£351	0	0
Savage (accepted)	339	0	0

Tilehurst, near Reading.—For alterations and additions to the Roebuck Hotel, for Messrs. Hawkins. Mr. G. W. Webb, architect, 1, Blagrave-street, Reading. Quantities supplied:—

Elliot, Newbury	£1,590	0	0
Kimberlee, Banbury	1,500	0	0
Dodd, Caversham	1,498	0	0
Simonds, Reading	1,484	0	0
Wernham, Reading	1,477	12	0
Higgs, Reading	1,429	0	0
East, Reading	1,412	0	0
Jenkins, Reading	1,280	0	0
Kingerlee, Banbury (accepted)	1,200	0	0

[All bricks, sand, and a portion of the fittings will be provided by the proprietors.]

Uckfield.—For drainage works at Ridgwood, for the Uckfield local board:—

Ware (accepted)	£48	0	0

West Brighton.—For making new road for the proprietors of the Aldrington Estate, West Brighton. Mr. Arthur Lewis, C.E., surveyor:—

Oliver	£370	0	0
North	361	0	0
Harrison (accepted)	310	0	0

West Ham.—For the execution of road and sewer works on the Stratford Market Estate, West Ham, for the United Land Company (Limited):—

Waller, A.	£2,180	0	0
Crockett, W.	2,150	0	0
Acock, G.	1,760	0	0
Killingback	1,749	0	0
Porter, W.	1,719	16	0
Wilson, H.	1,588	0	0
Jackson, John	1,499	0	0
Ford and Co.	1,495	0	0
Holloway	1,490	0	0
Jackson, Jesse (accepted)	1,399	0	0

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Westwood Ground, Box Ground, Combe Down, Corsham Down, and Farleigh Down.

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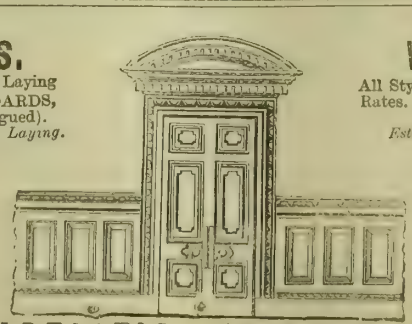

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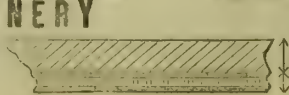

ORNAMENTAL PARQUET.
DEAL BACKING.

THE BUILDING NEWS.

LONDON, FRIDAY, APRIL 8, 1881.

THE BUILDING EXHIBITION AT ISLINGTON.

[FIRST NOTICE.]

A GENERAL glance at the manufactures and various appliances connected with building, engineering, and decoration now open to the public at the Agricultural Hall, Islington, affords satisfactory evidence of the public appreciation of the idea and of the efforts of its promoters to insure success. Confining our present notice to a general review of a few of the leading exhibits in the order of the main avenues, we first remark an extensive show of decorative chimney-pieces and stoves in suites, kitchen-ranges, &c., exhibited by Messrs. Ashton and Green, of Bury-street, St. Mary Axe, E.C. The sculptured statuary, Siena, and other Italian marble chimney-pieces, are costly and elaborate in design, and the general visitor will find much to interest him in the workmanship and finish of these exhibits. The suites are intended to illustrate the fittings and decorative accessories for the fireplaces of drawing-rooms, dining-rooms, halls, bedrooms, and other apartments. The enamelled slate designs in dark green, black, and other colours are well worth attention; these, in some instances, are relieved by cut and gilt scrollwork; they are in all sizes, and are fitted with slow-combustion stoves, tile hearths, fenders, and fireirons of suitable patterns. We notice an enamelled slate dado in sage green, with peacock-green frieze enriched with floral ornament on an oak plinth for bath-rooms; some well-finished Queen Anne grates, with embossed electro-bronzed panels in the sides; a few excellent "Parson's Grates," black and brass moulded register-stoves, fenders and fireirons; a large display of kitchen tile panel ranges of different makes, enamelled baths, lavatory tops; while another part of the collection is devoted to ridge tiles, string-courses, and other architectural wares. We also noticed the "Kyrle Grate" (Parker's Patent), named, we presume, in honour of the society which, in junction with the National Health Society, has been instrumental in bringing questions of sanitation and house-furnishing to the front. It is manufactured by the Coalbrookdale Co., and one important advantage appears to be the adaptability of the principle to any grate. The one shown has the appearance of an ordinary open fire-grate of the form familiar to the public as the "Country Parson's Grate," but called by the Coalbrookdale Co. the "Iron Bridge" grate. The improvement lies in the back arrangement, which is, however, remarkably simple: a hole about 10 by 2 is made in the bottom of the brick just above the solid bottom of the fire, which aperture communicates with a supplementary flue at the back. The draught draws through the lower part of the fire into the supplementary or back flue, whilst the upper portion of the fire draws through a small aperture in the top plate which occupies the place of the usual register door. The two flues meet just above the point and join the chimney proper; thus, a high degree of temperature is raised and maintained, a damper at the top regulating this, and a sliding blower in front, which, however, is only necessary when the fire is in process of lighting. Mr. Joseph Tall, of Lordship-lane, Dulwich, shows a new method of building in concrete, in which the material is cast in the form of panels about 3ft. 10in. by 3ft. This improved mode of concrete building is illustrated by a room built with the material, fitted up with a bay window with mullions, a fireplace, &c. Each slab or panel is about 3in. in thickness, and is cast in a mould so that when put together they form a series of panels with stiles and rails; the joints occurring in the centres of these. The interior framework is moulded, and the external projections are left square; the outer surfaces of the panels can be ornamented with coloured materials or simply rough-cast. Drawings showing a patent roof, dispensing with lath and plaster, indestructible door and window-frames, &c., are also exhibited. Ventilating contrivances are numerous: Messrs. Boyle and Son, of Bothwell-street, Glasgow, and Holborn Viaduct, exhibit their patent self-acting air-pump ventilators of various forms, adapted for the extraction of foul air from buildings of various kinds. The forms shown range from the most elaborate flèche or turret, to plain, circular, and square, and the ventilators can be applied, not only to apartments, but to soil-pipes, drains, workshops, &c. These are made of all usual sizes of pipes. Chimney-cowls and vertical-tube inlets are special manufactures of this firm, and a large diagram, explaining the application of Messrs. Boyle's system of ventilation to houses and other buildings, will be scanned with attention. We may next notice the improved wood revolving shutters, worked by a balance-weight motion, for the purpose of regulating the coil, as that by Salmon Barnes and Co., of Ulverston—a marked advance on the old system by obviating all friction, &c. Gas-fittings and chandeliers of many new patterns are to be found in the stall fitted up by Messrs. D. Hulett and Co., High Holborn. The opal shade light for large rooms is a great improvement in economising illuminating power; the shade throws the light on the table, whereas the ordinary globes in use reflect it on the ceiling. We commend also the hexagon tubes for gas-brackets introduced by this firm, and their street-lamps are certainly economical in avoiding putty-glazing. Architects will be repaid by inspecting the beautiful specimens of the "Lincrusta-Walton" or Muralis decorations of Messrs. Walton and Co.; and the artistic wall-papers of Messrs. Jeffreys and Son, of Essex-road. The blueish-grey wall-paper and dado, and a light silvery grey paper, enriched with Renaissance scrolls, heightened by gold, are particularly rich and effective. Messrs. Jackson and Graham exhibit examples of their fibrous plaster ceilings and cornices, and the Adamite decorations and friezes show the capabilities of the material for relief painting and ready fixing to ceilings and walls. Another and more recent decoration lately noticed by us is to be seen in the artistically harmonious and quiet interior furnished by the Papyrotile Company, of Holborn Viaduct, a kind of paper-tile wall decoration, affording a comfortable and semi-hard surface, resembling stamped plaster or leather, which can be printed and embossed to any pattern, and in various pleasing shades of colour. The room thus lined is of a dark sage green, with a warm-toned folial pattern in embossed relief, and a rich dark dado of brown relieved by gold margins. In the departments of faïence and terra-cotta, Messrs. Wilcock and Company, Burmantofts, Leeds, contribute a variety of their manufactures in glazed bricks, terra-cotta, Burmantofts faïence, and sanitary ware, and their specimens are superior in design and colour to any in the Exhibition. In this climate we cannot conceive a more durable, cleaner, or brighter material for our house-fronts. String-courses, diaper-work, in brown and tints of green, panels in different shades of pleasing colours, with relief ornament of natural and conventional foliage, panels and plaques for inlays to furniture, are among the instances this firm exhibit to show the capabilities of their excellent material. A few well modelled panels, with emblematic figure-subjects, are in good taste. The colours are in shades of brown and green. Specimens of tiles pleasingly arranged in geometrical but irregular lines, embossed with suitable Queen Anne and Renaissance ornament, in gradations of green and blue blended into pleasing harmonies, are in good keeping, and contrast with many of the vulgar examples of such work to be found in the exhibition. Messrs. Wilcock show what may be done to relieve our chimney-pieces, hearths, and dadoes by the substitution of high-class modelled and coloured faïence for bad carving in wood. We notice in the collection some unique vases of antique shapes made in the same clay, with the colour blended and glazed, of superior manufacture; a large red terra-cotta medallion with head, a few well designed consoles, and a variety of glazed-coloured bricks moulded and plain. We may merely add that Messrs. Wilcock's collection does not pretend to compete with the bizarre and cheap manufacture conspicuous for tawdry decoration and colours. In the sanitary department of this firm we remark a very strong kind of stoneware closet made in the sectional form of a trough, and of such a size and thickness that its use supersedes the ordinary wooden riser, the only part requiring to be lined being the seat. It is needless to say the Sanitary Trough Closet can be readily cleansed; the trough can be fitted to a range of several closets, with partitions of brick or simply galvanised iron or slate, projecting a little, and of a sufficient height between each as to insure privacy. For schools, factories, barracks, and other buildings of a public character, the trough-closet is well adapted, and appears to be a great sanitary improvement on wooden and iron ones.

Messrs. Burke and Co., of Newman-street, have a few highly-artistic specimens of their marble mosaic, a material well known to architects. These mosaics are of good design and colour, and the exhibits show what may be accomplished to produce imperishable wall decoration. The advantage of marble mosaic for polychromatic decoration, its freedom from artificial colouring and factitious elements, and the soft and harmonious effect, are needless to dwell on here. One of the principal specimens is a slab of mosaic of the *opus incertum* kind, composed of marble tesseræ, of irregular shape, inserted in a solid mass in cement, and afterwards rubbed and polished. The design is of semi-Greek or Pompeiian character, a scroll-work and honeysuckle of black tesseræ with birds are introduced, on a ground of a pleasing mixture of blended colour, in which yellow, red, and grey are the predominant colours. The marble mosaic concrete manufactured by this firm for the Law Courts is a capital paving material, and the colours are harmonious. The examples of foliated borders in white and black are very bold, and suitable in character for pavements and surface decorations where flatness is essential. Messrs. Doulton and Co.'s show of ware, sanitary and artistic, is a fair representation of this well-known firm's manufacture. We need only single out here a capital new siphon waste preventer; samples of the new radiating tile stoves, a great improvement on iron stoves, as there is no smoke; a filter, invented by Mr. Bailey Denton, in which ground stoneware and sand are the filtering materials, the specimens of the Doulton ware in tiles and art pottery, and terra-cotta details for buildings and decorations.

Several firms of established reputation

exhibit in various forms of decorative ironmongery which the present styles of house-architecture have called into existence. Messrs. Yates, Haywood, and Co., of Upper Thames-street, show some creditable things in the way of Queen Anne stoves, kitcheners, marble mantelpieces, &c., and there are some others, with chimney-pieces and overmantels in walnut, manufactured by Messrs. Walker, of Bunhill-row. Mr. James Hill shows a large collection of Queen Anne and Elizabethan locks in brass. Rim, mortice, drawback, stock, and cabinet locks of various patterns, night-latches, brass furniture, and plates of superior quality are to be seen. For more expensive locks, in which the ingenuity of the lockmaker has been taxed to the utmost to baffle the skill and dexterity of the burglar, the interesting stall of Messrs. Chubb and Son, of Queen Victoria-street, is worth a visit. Messrs. Chubb exhibit several wonderful and beautiful specimens of the art of the locksmith. We need only to name the electric time lock, in which two chronometers are introduced, constructed so that it can be adjusted to any time; the electric burglar alarm, contrived in such a manner, that even if the wires are cut, or tampered with in any manner known to expert burglars, the alarm is sounded. The combination keyless lock is also a marvel of the locksmith's art, and we are glad to find that perfect mechanism can be combined with the artist's taste, and that our leading locksmiths are emulous of imitating the Mediæval artists, and the later workmanship of the Tudor period. Many of the mechanical improvements in this art are due to our American friends, and to the great Hobbs a debt of gratitude is due in challenging the asserted superiority of our own skill. Those, at least, who take an interest in safes and locks will find, by a glance at Messrs. Chubb's stall, that we have made some progress of late years in this direction. The comfort of students has not been forgotten. Messrs. Colman and Glendenning, of Norwich, exhibit a very cleverly contrived seat and desk, both of which can be adjusted to suit the pupil. The seat-back is fitted with Dr. Roth's spine pad, which can be raised or lowered to suit the support required. This "adjustable desk," and the science and art table," which can be used as a flat table, as a desk for writing, and a sloped rest for drawing and sketching, are certainly noticeable and inexpensive appliances for the school or class-room. The Glendenning "modern desk" is made in pitch-pine, birch, walnut, varnished or polished, the desk and seat being supported by cast-iron standards.

Parquetry and wall panelling are largely represented by many manufacturers. We may especially call attention to Messrs. J. E. Eberhard and Co's (Edward-street, Hampstead-road) improved parquet flooring and patent glue for laying parquet on wood, stone, concrete, and other surfaces. The specimens of treads in end-grained wood, and teak nosings, and the samples of parquet for dadoes and other purposes are worth attention. We have already noticed the advantages of Messrs. Eberhard's thin parquet laid in their patent glue, and we may now draw notice to their panelled dado, a handsome parquetry table, and several specimens of moulded joinery and carved panels. Mr. H. Bassant, of Well-street, is the exhibitor also of improved parquet flooring and wall panelling. A very effective dado, in two kinds of English oak, is an excellent specimen of workmanship. Messrs. Esdaile and Co., of the City-road, are conspicuous exhibitors of Swedish doors, flooring, &c., of various descriptions and moderate prices. A four-panelled inside door, 7ft. by 3ft., moulded both sides, costs only 15s. 5d. in deal framing. The American doors, architraves, and other mouldings are also well turned out and cleanly worked. In this connection we may mention Webb's (Worcester) "Decorated Woods" for floors, walls, &c. These are tile-like blocks of pine, stained throughout their substance with various colours in elaborate patterns. They have the appearance of being inlaid, but the colours are rather tawdry. Of course, unequal shrinkage is avoided.

A branch of house-fitting manufacture, which seems to have made great strides of late years, and is well represented at the Exhibition, is that of window-sashes and window-blinds, &c. No less than a dozen exhibitors we have noted display specimens of sash arrangements, fastenings, lifts, fittings, blinds, and shutters. A handsomely fitted-up stall in the main avenue (Messrs. Hodkinson and Clarke, of Birmingham) is worth a visit for its unique display of window-blinds, shutters, &c. We may draw particular notice to the "Queen Anne" window-blind revolving shutter, a neat and effective shade, also serving as a ventilator for diffusing the air through the room; the laths are, as in the venetian blind, with intervening spaces, and it is made as a revolving shutter to coil in a cornice above the window. The coil takes up a small space, and the prices quoted for red deal is about 1s. 8d. per foot superficial primed. The "metallic venetian" blind is certainly an economical substitute for wood, and occupies less room. Another clever form of revolving shutter is shown to a doorway. It is called the "Early English" revolving shutter: the surface is studded over, representing nail-heads, and when painted of a dark colour and gilded, represents a light metal surface. The lead lights of this firm are neater than usual, and compare well with many lead-glazed lights, and we have confidence in recommending them to architects.

J. Tomlinson and Sons, Leeds, exhibit an ingenious model of a "reversible window" (Phillips' patent), the advantage of which is that ordinary sashes can be made to swing round for cleaning, thus avoiding the risk of accidents in cleaning from the outside. The sashes are hung clear of the slips and inside bead, and to avoid straight joints, the side of sash is rebated, and a metal bar inserted to fit the rebate. Each sash is turned on two pivots or screws fixed to the bars. Another advantage of the pivots is that the sashes can be brought up close to the bottom bead and the meeting-rails. The method can be applied to any common sash window, and we can bear testimony to the simplicity and effectiveness of the invention. The "Ulverston patent revolving shutter," well known to builders, is shown by a full-size working model, by Salmon, Barnes, and Co., Ulverston. It is needless to say the motion is rendered free from the objections urged to many ordinary revolving shutters, and the manufacturers guarantee the working. A variety of fittings for shops, stabling, and other purposes, is to be seen in the stall of Messrs. Clarke, Bunnett, and Co., of Queen-street. Cast-iron fittings to stalls, of good construction, are shown by a model, and the lift, with patent brake, is an improvement on the old plan. We notice, also, specimens of metallic blinds. Close to this stall, Messrs. Jones and Willis, of Euston-road, send numerous articles of their manufacture. The "Hesperus" lamp, of various patterns, is worth notice; the light given is said to be equal to 45 candles. Suspending and table lamps, pendants, coronæ, brackets, and every form of domestic and ecclesiastical brasswork will be found, and the workmanship and finish leave little to be desired. In scagliola the exhibits of Messrs. Bellman and Ivey, of Wigmore-street, claim notice; various specimens of executed works of columns, dados, capitals, and the mode of covering iron or brick cores with scagliola, are shown, and worth attention from the profession. The imitations are remarkably good.

We have already referred to a concrete cottage in slabs. Several exhibitors show forms of improved concrete apparatus. Mr. Thomas Potter, of Grange-park, Alresford, has two models, one showing his monolithic concrete apparatus for building, and the other, hollow walls constructed with Potter's dove-tailed facing slabs, which require no appliances, and which make smooth-finished surfaces on both sides. There is a model also showing how half-brick facings may be used with the slabs inside. To architects desirous of comparing the advantages of the different systems, these models, and the apparatus shown by Messrs. Tall, and Drake and Co., in another part (No. 296), will be found of interest. Mr. Alfred Walker, of Leeds, shows a Queen Anne pilaster with trusses, some excellent fire-proof steps, in which iron slag has been introduced in the aggregate, and a very hard granite concrete. The best proof of the excellence of this material are the works executed by Mr. Walker; among these we find the paving to nave and aisles of St. Bartholomew Church, Armley, Leeds, a large structure lately illustrated in our pages, from the designs of Mr. Henry Walker; the gun-platform at Bridlington Quay, several railway platforms, as Clayton and Batley stations, others on the Great Northern Railway. The concrete pavement has been used also for the Redmill and Pontefract, and other station platforms, and for this purpose no material can offer greater advantages. Some thousands of yards have been laid for the Leeds School Board at various schools; and for heavy traffic and stable floors cannot be surpassed. Mr. W. H. Lascelles, of Bunhill-row, has again a very interesting and instructive exhibition of his concrete work. The chimney-pieces, designed by Mr. Norman Shaw, R.A., are capital examples of manufacture. We also observe a window, designed by Mr. A. W. Blomfield, M.A.; others by Mr. A. Waterhouse, R.A.; a clustered pillar, designed by Mr. A. W. Bloomfield; and various tastefully-designed and manufactured panels, balustrades, cornices, strings, and other articles. Mr. Lascelles' patent tile slabs may be seen well introduced in the model cottage exhibited by Messrs. Ihlee and Horne, of Aldermanbury, in another part, built to show the value of Balmain's luminous paint. The walls and ceilings of this chamber are washed over with this paint, and present a highly luminous effect, an artificial daylight, which may be turned to profitable account in various ways. Messrs. Inlee and Horne's rustic cottage is one of the most complete illustrations of the value of this paint we have seen. We believe the paint can now be had at 6s. a lb.

We must defer till next week notices of several other exhibits, and will have something to say on a variety of important contractors' labour-saving appliances. Mr. F. W. Reynolds, of Blackfriars; Crossley Bros., of the Poultry; Messrs. Rosser and Russell, of Charing-cross, are exhibitors of some very excellent appliances and machinery. The "Eureka Concrete Co.," of Queen Victoria-street, are also exhibitors of various useful and ornamental applications of their concrete, and for staircases and railway platforms no material is better suited. Messrs. Hamilton and Co., of Leadenhall House, have, as usual, a striking display of their patent prismoidal lens pavement lights, to which we may draw attention in our next; Messrs. Hobbs, Hart, and Co., of Cheapside, show a bullion-vault door, as made for the Treasury at the Bank of England, and some capital safes called the "Progress." Messrs. Rownson, Drew, and Co. also exhibit some specimens of rolled iron joists and brasswork of good design, while sanitary appliances are too numerous and important to mention in detail this week. The searcher

for novelties in this direction will find much to interest him in Messrs. Capper, Son, and Co.'s exhibition, and at other stalls to which we hope to be able to refer in our next issue. All who value brightness and cheerfulness about a house should see the variety of tasteful and inexpensive blinds and blind-materials shown at stand 200 by Messrs. J. Avery and Co., of Great Portland-street, which are as unique as they are desirable; and a modest little invention should not be overlooked in Shaw's "Dustless Cinder Sifter," devised by a lady and shown by Mr. Godden at stand 350, which, if only the servants can be prevailed upon to use it, will certainly prevent dust in many a room and save many a ton of coals in the course of a lifetime. The show of cooking apparatus, stoves, steam washing-machines and wringers, made by Mr. Clements, at stalls 17, 18, 20, and 21, will repay attention. Our examination led us to the conclusion that they were really labour-saving appliances, and in many cases inventions of a similar kind are pushed before the public, which not only imperfectly fulfil their objects, but involve more work than the older and simpler hand-processes they are meant to supersede. The last exhibit we can mention this week is that of Messrs. Lovedee, Son, and Bate, of the New Kent-road (No. 375), comprising some useful locks and door furniture, a patent sash-lifter of simple action, a patent curtain-fastener, and one or two other domestic helps, which, if a little beyond the scope of a building exhibition, are certainly within the wants and means of everyone who lives in a house made with hands.

THE SOCIETY OF BRITISH ARTISTS.

THE fifty-eighth annual Exhibition of the Society of British Artists, Suffolk-street, Pall Mall, East, opens with the display of some pleasing pictures, and if there is nothing strikingly original in the collection, the walls show a more healthy tone in treatment and colour than we have lately seen. Incident in everyday life forms, as usual, a large class of subjects, and one of the most pleasing oil-pictures which greet us in the large room is Mr. J. R. Reid's subject, "Her Constant Care," in which the painter, with his customary freedom of handling and freshness of colour, depicts an old farmhouse and yard, with a thoughtful housewife engaged in feeding her brood of chickens. The picture, however, has more in its treatment and handling than the subject to engage attention; the touch of the artist, rather "blottesque," is never of that painstaking neatness which many admire; there is a *négligé*, but without indecision or crudity, a suggestion of freshness in the early foliage. A well-known member, W. Dendy Sadler, the painter of "Complete Angler" and other well-known works, sends one of his amusing studies of monastic life in "A visit from Brother Dominie." The jovial countenances of the monks with their fishing tackle are humorously portrayed, a glimpse of the old monastery above its surrounding of foliage appears in the background, and the only exception we take is the particularly prim and modish porch, which has an exceedingly modern look about it rather out of keeping. "Return from Sport," by J. S. Noble, M., occupies a conspicuous place. It is a large canvas; the group of dogs, watchfully guarding the bench of game, is vigorously painted, wanting, however, in the solidity of shadow. The same artist's "Waiting and Watching," another large picture (195), representing a harvest scene, the chief figures being a horse harnessed to a rude cart partly laden with the sheaves of wheat, displays a more masterly handling in composition, light and shade. J. Gow, M., E. Gustave Girardot, M., A. Ludovici, are well represented by works such as "A Gipsy Nymph" (20), "Anxious Inquiries" (27), "The Little Beggar" (41), "A Cosy Corner" (46). The last is French in handling, soft and bright in colour and rich in accessories; the girl in bright blue dress, and the bay windows are truthfully rendered.

Landscape is admirably represented by such consummate masters as A. F. Grace, James E. Grace, James Peel, Stuart Lloyd, all members of the Society. "The South Downs" (16), a picture of undulating scenery, is painted in the low key of colour affected by the school to which its painter, Mr. A. F. Grace belongs; the ground looks brownish in hue, but though we are not charmed by fresh pastures, there is a good deal of true sentiment about this picture of open downs. A particularly fine landscape is "Cyffing Fall, Capel Curig" (33), by James Peel, M., always a skilful delineator of Welsh scenery. The hazy atmosphere is exceedingly well-painted, and equals the artist's reputation as a painter of mountain effects. "The First of June" (34), by F. M. Chase, is a clever rendering of the effects of sunshine upon landscape; the air looks still, and everything wears a settled aspect. The artist has been happy in depicting the summer's sheen. No. 42, "A Pond with Weeds about its Side," by James E. Grace, is a sympathetic grey-toned picture, belonging rather to the French than English landscape school, but admirably painted; while close to it, "Crabbed Age and Youth," by W. C. Symons, is as tawdry and garish in tone. G. F. Munn, in "Barren Land," is, as usual, naturalistic in treatment; and "Harvest Time," by T. F. Goodall, a large landscape, freshly painted and breezy, belongs also to the modern school of English landscape. In the corner of the room J. Whipple's "Land of Hills and Rivers," a scene in North Wales is equally striking for its conventional French manner, hard in handling and sombre in its tone, contrasting remarkably with the fine landscape below it by George Cole, M., entitled, "Fittleworth Old Mill Lock, on the Rother, Sussex" (118), a large, warm-toned picture painted with all the delicacy of manipulation and balmy softness and luminous colouring which distinguishes this well-known artist's work. The aërial haziness of the scene, and its rich sunlit effect and introduced cattle are harmonious elements, and if they rather verge on the effeminate in style, will always be very popular among a large class of picture admirers. "Where Once the Garden Smiled," by Stuart Lloyd, M., one of our leading painters of the Naturalistic school, is another large and taking picture, representing a great expanse of sea from a precipitous cliff clothed with verdure and apple-blossom, such as one may see on the south coast. The sea in its depth of blue and green, bounded by the extended horizon, forms a grand contrast with the green spring-like foreground and rich blossom. "A September Morning" (145), by J. H. Snell, is too pre-Raphaelesque in treatment. J. White's "Deepening Twilight," Stephen E. Hogley's "Going South," a solidly-painted mellow-toned mountain, with cattle; J. White's "Silver and Gold" (201), a wonderfully truthful rendering of trees, bold in handling; H. Campion's "Autumn," a grandly-painted coppice, are other clever landscapes.

"Ophelia" is the name of a skilful and poetically-conceived composition by A. J. Woolmer, painted in that classically semi-mystic vein so characteristic of the artist. The landscape depicts one of those deeply-shaded groves which the author loves to paint, in which the high lights are brought out with almost fantastic and iridescent brilliance heightened by the depth of blue in the recesses of the shadowed part. In the foreground, shaded with "pendent boughs" at the margin of the "weeping brook," sits "Ophelia," her "bright coronet of weeds" hanging on the branches. The manner and colouring aim more at the scenic than the natural. Of *genre* painting we notice:—Fred. Slocombe's "Leaving Home" (133), a girl attired in black in a railway compartment, with much that is pathetic, and the execution is careful. "The Two Violins," by Gertrude Martineau, almost too intensely æsthetic, and the colours in a low key of harmony; but perhaps the most successful picture in this room is Horace Cauty's "Whither?" a little girl and kitten on the steps of a quay or landing-steps, pure in colour and sentiment. H. Caffieri's "Isabella" is a little out of scale, the figure is dwarfed by the huge green vase of flowers; it is redeemed, however, by the harmony of the colour. Jas. Hayllar's "Dinner Hour" (63), Sir John Gilbert's "Sancho Panza" (75), J. Burr's "Pride of the Ballet," A. Glasgow's "Dressing the Model" (101), are all creditable productions. A very touching historical incident is told by L. C. Henley in his "Martin Luther Singing in the Streets of Eisenach" (105); the wife of Conrad Cotta, and the clean picturesque background of houses are well drawn, and show both invention and good colouring. J. Fraser exhibits some dexterous handling on his fine seascape "Seeking a Haven," the glistening light of the rolling waves, and the distant rock-cliff which looms through the half-irradiated mist, are painted with a crispness and finished care worthy of the artist's skill. C. Rossiter, in 231, paints some picturesque costume in his quietly-toned piece "The Search," Flemish in its furniture and accessories; A. F. Patten, in his more ambitious incident from the "Tempest," the "Meeting of Ferdinand and Miranda," exhibits his wonted power as a graphic portrayer. The composition is highly finished, and there is much beauty in the face of Miranda. P. Macnab's "Village Bridge" is a natural English landscape. The visitor will not leave the room without bestowing praise on Wyke Bayliss's grandly painted "Interior of St. Mark's, Venice" (210). The intricate sculpture and splendour of the marble mosaics almost dazzle the eye accustomed to the more subdued grandeur of our own cathedrals; the painter has chosen the north aisle of the choir, with its magnificient pulpit of serpentine, and by his dexterous manipulation of glowing colour and deep shadow, has thrown a poetical charm over the interior of an edifice few artists have been able to depict without falling into garishness.

Among many pictures of mediocre quality we meet with several of merit in the south-east room. In E. A. H. Lucas's "Besieged" (245), the painter has drawn upon the Mediæval incident; the fortress, and the besieged who are intent upon fishing in the stream beneath the walls, are painted with telling effect. Edwin Ellis's "Waiting for the Boats" is a large striking picture, bright and vigorous in handling, in its contrasts of light and shade, but not quite so "impressionistic" in manner as others we have seen of his; while, above, W. Grossmith depicts a humorous subject—a party of gentlemen seated round a table carousing, certainly in a more merry than sober frame of mind. The tallow candles flaring, and burnt low in their sockets, the smashed glasses, the bluish daylight streaming over the shutters, and the dissipated faces of the company are truly suggestive of the title "Till Daylight doth Appear," and recalls the time of the Georges. A keen sense of landscape effect and manipulative skill is shown in A. S. Williams's view (338), in Jas. E. Grace's "Eventide" (350), C. Gibbs' "View in Surrey" (269); W. Gosling's "Thames by Shiplake Lock" (282),

"Early Spring" (319), "On the Canal, Abeville" (293), W. Hemsley's "Flotsam and Jetsam" (355), J. E. Jacob's "Loiterers" (350), D. Passmore's amusing study (313), "Last Sunrays," by Sir R. P. Collier" (295). Lionel P. Smythe's "Up a Tree" is also clever. In the south-west room W. Bromley's incident from Sir W. Scott's "Heart of Midlothian"; the exquisitely finished little cabinet piece "Wedding Presents," by Mary Hayllar; A. de Bréanski's fine colour reflection in "Silvery Thames," T. F. Goodall's "Hide and Seek," K. Warren's "Introduction," F. W. Meyer's "Moonlight Scene" (433), and No. 454, by Stuart Lloyd, are a few of the best. J. E. Christie's "Group of Figures in a Dusky Road" (478), and Nos. 509, 511, 513, 517, 541, 545, are worth noticing in the anteroom to the large gallery. Before leaving the oils, we may award a tribute of praise to Miss Henrietta Rae's studies, Nos. 23 and 55, which are ideal rather than commonplace conceptions.

The water-colours contain a few creditable performances, though in many of them we find the purity and tone of the transparently-mixed pigments giving place to the use of opaque colours and artificial handling with the object ostensibly of standing comparison with the oils. D. Passmore's "Old Church, Caterham" (574), is boldly and pleasingly sketched in the less objectionable form. A few other architectural sketches are to be seen on the walls; we may refer in passing to Richard M. Rae's "Street in Antwerp" (582), showing the tower of St. Jacques, Elizabeth Petrie's, "Canal, Venice," and "Goldsmiths' Arch, Rome," and the effective drawing of the "Globe Room at the Reindeer Inn, Cromwell's Council Chamber," by G. R. Clark. The artist has effectively drawn the fine mullioned window, ceiling, and chimney-piece of this once handsome Tudor apartment, and the group of Cromwellian figures have been introduced by C. Cattermole; but the most striking architectural subject is Wyke Bayliss's fine interior of St. Madeleine, Troyes, where the correct drawing and delicate intricate detail of sculptured work are intensified by the fine colour and management of light and shade. Mr. Evan's "Canal Scene" (701), with the Bridge of Sighs, and Mr. R. Phené Spiers; "Old Houses, Antwerp" (758), are both clever. W. J. Muckley's "Wildflowers" (600), Bernard Evan's "Sunset" (642), Alice Ellis's "Study of Azaleas" (661), Mrs. F. Hall's "Primula," David Law's "View near Cookham" (665), F. W. Wainewright's fine cattle-study, "Sunrise" (691), A. R. Quinton's "Quiet Retreat" (672), Carlton A. Smith's clever figure-studies, "Sorrow" (702), and "Happinesss" (712), are a few other drawings which are worth notice. The pictures we have pointed out have been necessarily limited to those displaying invention or artistic merit. Unavoidably, many mediocre and feeble productions will be found on the walls, not a few artists having adopted the artificial and essentially realistic manner that has lately come into fashion; but the visitor will find ample to recompense him in good drawing, and purity of sentiment and colour.

THE WATER QUESTION.—VI.

THE quantity of water flowing down a river channel may be calculated by the following formulæ: they range, in point of accuracy and attention to details, from the simplest and most general to the nicest refinements of correction for varying conditions of a flow of water; but they all depend essentially upon the two conditions of hydraulic mean depth and inclination of the surface of the water, which together govern the velocity. The volume is the product of the cross sectional area of the stream and the mean velocity of the whole section, and while the former is a matter of simple measurement, the latter is more difficult to arrive at with any degree of accuracy; and it is only after an investigation of the immense number of experiments which have been made, that the authorities in the science of hydraulics have been able to arrive at formulæ which represent the true velocity approximately. With certain precautions, the velocity may, in some cases, be actually measured, as well as the cross sectional area, and when that can be done the volume may be found more satisfactorily in that way. The cross sectional area of the stream may be measured by selecting a part of the river which is of tolerably uniform section for a considerable distance—say 200 yards—dividing the distance into equal lengths, and measuring the cross section of each division by means of ropes—preferably of wire—strung across the river, taking the depths at short intervals along the ropes, and where the difference of level of the surface of the water at the two ends of the length of river experimented upon can be ascertained with accuracy, the mean velocity of the whole stream in ordinary cases and in tolerably uniform channels may be found by the formula deduced by Eytelwein, or that by Du Buât. The fundamental conditions are that the velocity varies as the square root of the hydraulic mean depth, the fall being constant, or as the square root of the fall when the hydraulic mean depth is constant; or, neither being constant, as the square root of the hydraulic mean depth and fall multiplied into each other; and to bring this abstract rule into conformity with observed actual velocities a coefficient is applied, of such magnitude as to bring the abstract numbers into coincidence with the actual numbers observed. Eytelwein's rule for the mean velocity per second is

$$v = \frac{10}{11}\sqrt{hf}$$

where h = the hydraulic mean depth, and f = twice the fall per mile; h, f, and v being all in feet or all in inches.

Du Buât's rule is, for inches,

$$v = \frac{307\,(\sqrt{d} - \cdot1)}{\sqrt{s} - \text{hyp. log. } \sqrt{s + 1{\cdot}6}} - \cdot3\,(\sqrt{d} - \cdot1)$$

and for feet,

$$v = \frac{88{\cdot}51\,(\sqrt{d} - \cdot03)}{\sqrt{s} - \text{hyp. log. } \sqrt{s + 1{\cdot}6}} - \cdot084\,(\sqrt{d} - \cdot03)$$

d being the hydraulic mean depth, and s the length in which the surface of the water falls one unit, as 2,640 when the fall is 2ft. in a mile. The fractional deductions are made from the fundamental formula—

$$v = c\sqrt{\frac{d}{s}}$$

in which c is the coefficient 307 or 88·51, in order to make it agree more nearly with the results of experiments under varying conditions, and are applicable in cases of moderate velocity of 2ft. or 3ft. per second.

Other authorities make corrections for similar effects of increasing velocity. Thus, Mr. John Neville, in his "Co-efficients and Formulæ," published by Messrs. Crosby Lockwood and Co., gives, from experiments made by various persons, the increasing coefficient as follows, when applied to the abstract rule $\sqrt{rs}$, r being the mean radius or hydraulic mean depth, and s the sine of the angle of inclination, or the fall in any length divided by that length; thus being $\frac{1}{2640}$ when the fall is 2ft. in a mile. For a velocity of about 1ft. per second the coefficient is 91·3; for about 1¼ft. per second it increases to 95·5; for 1¾ft. per second, 98·6; for 2ft., 100·5; for 2½ft., 100·6; for 2¾ft., 103; for 3¼ft., 106·6; for 5ft., 109·3; for 6ft., 111; for 7½ft., 112·3; for 14½ft., 117·9; for 15½ft., 118·4; and for a velocity of about 21ft. per second, the coefficient is 120. As the velocity thus does not strictly follow the rule of $\sqrt{rs}$, Mr. Neville has found a more exact formula, which is—

$$v = 140\sqrt{rs} - 11\sqrt[3]{rs}$$

and this seems to agree nearly with observed velocities under all circumstances. Mr. Neville has found that Du Buât's formula may be pretty safely relied on when applied to general practical purposes, and says that much of the valuable information presented by Prony and Eytelwein is but a modification of what Du Buât had previously given, and to whom we are primarily indebted for much that is attributed to the two former.

None of these found any difference in the velocity of a stream which could be attributed to the kind of surface over which it ran; but a later authority, Kutter, has introduced into his formula, as translated by M. Lowis D'A. Jackson, a term of correction according to the kind of surface, as brickwork, earth, gravel, &c.

Kutter's formula is, for English feet—

$$v = \left\{ \frac{\frac{1{\cdot}811}{N} + 41{\cdot}6 + \frac{\cdot00281}{S}}{1 + \left(41{\cdot}6 + \frac{\cdot00281}{S}\right)\frac{N}{\sqrt{r}}} \right\} \sqrt{rs}$$

in which v = mean velocity in ft. per second, r = mean radius or hydraulic mean depth in ft., S = sine of the hydraulic slope of the surface, N = coefficient of roughness and irregularity; and the values given to N are for brickwork and ashlar in good order, ·013; for channels in earth in good average order, ·020; and for rivers and brooks, from ·020 to ·035; but this formula is not so well adapted to rivers as the three preceding.

It may be useful to compare the results of the first three rules. In a river of 100ft. mean width, 6ft. deep., and of such a contour of bed as to give 5ft. hydraulic mean depth, the fall of the surface of the water being 2ft. per mile, or 1 in 2,640, the mean velocity in feet per second by Du Buât's rule is,

$$\frac{88{\cdot}51\,(\sqrt{5} - \cdot03)}{\sqrt{2640} - \text{hyp. log. } \sqrt{2641\cdot6}} - \cdot084\,(\sqrt{5} - \cdot03) =$$

3·93 and 3·93 × 600 = 2,358 cubic feet per second.

By Eytelwein's rule it is,

$$\frac{10}{11}\sqrt{5 \times 4} = 4{\cdot}06$$

and 4·06 × 600 = 2,436 cubic feet per second.

By Mr. Neville's rule it is,

$$140\sqrt{5 \times \frac{1}{2640}} - 11\sqrt[3]{5 \times \frac{1}{2640}} = 4{\cdot}73$$

and 4·73 × 600 = 2,838 cubic feet per second.

And if we take the coefficient for velocities about as much as this to be 109, as found by others (in this case by Mr. Provis) the mean velocity would be

$$109\sqrt{rs} = 109\sqrt{5 \times \frac{1}{2640}} = 4{\cdot}74 \text{ ft. per second,}$$

or, practically, the same as by Mr. Neville's own rule; and it illustrates what is found to be a general tendency in all the hydraulic formulæ derived from experiments necessarily made on a comparatively small scale—viz., that the action of large masses of water is sensibly greater than these formulæ indicate, so that in applying them to rivers of large volume they rather understate the actual quantities, which, indeed, is no fault, but the contrary.

The truth of Eytelwein's and Du Buât's formulæ has been confirmed by Mr. J. F. Bateman, F.R.S., for rivers and open watercourses where the section is tolerably uniform. When he laid out the Manchester Waterworks he constructed the works in many parts with special reference to taking such observations as would determine a great many points which were then somewhat in doubt, and he tested upon the watercourses there the calculations of al-

most everybody. (*Vide* Evidence, Water Supply Commission, 1868.)

But where the fall of the surface of a river is very small in any length that could be experimented upon, as it is in many cases, the inclination cannot be ascertained with sufficient accuracy to enable these formulæ to be applied for finding the velocity, and in those cases the volume of water is best ascertained by actual measurements of the velocity with floats, and for that purpose no better proceeding can be taken than that adopted under the directions of Mr. Bateman, on the river Thames. The length of the river experimented upon was divided into six measured distances, and the time was taken in which the floats traversed the six divisions at five or six different places in the width of the river. The mean velocity was not computed from the observed surface velocity, but was actually ascertained by floats so adjusted, that whilst one all but dragged upon the bottom, and therefore travelled with the bottom velocity, another floated at the surface, and the two floats being tied together, one acted upon the other, in quickening and retarding their respective paces. Gutta-percha was used for the floats; it is very nearly of the same specific gravity as water, being ·96 of water, and therefore it floats. A gutta-percha ball will float almost wholly immersed, so that the wind can have no effect upon it. The balls were so adjusted that one was heavier than the other, and sank to the bottom, but did not touch it, and thus by finding the mean velocity in all parts of the stream, the mean of the whole stream was found.

To estimate the mean velocity roughly by one observation, Prony's rule may be taken

$$v = \left(\frac{7{\cdot}783 + V}{10{\cdot}345 + V}\right) V$$

in which V = the maximum surface velocity in feet per second in the centre of the river, or in its axis, whether that be in the centre or not, and this gives for velocities similar to those in the above examples, the same results as in Mr. Neville's shorter rule

$$v = {\cdot}835\ V$$

which would indicate a maximum surface velocity of $\frac{4{\cdot}73}{{\cdot}835} = 5{\cdot}66$ft. per second, but for velocities about half these the mean is more nearly ·8V.

Referring to the examples above worked out, it must be confessed that there is no very near agreement between 3·93 as found by the first, and 4·73 by the last; but this velocity is greater than necessarily occurs in rivers, and the best judgment would probably be shown in using Eytelwein's or Du Buât's formula in cases of ordinary flow, and Neville's or Prony's in floods.

As to the velocity of water at the bottom of a river, or anywhere along its bed, it is very difficult to ascertain it by actual measurement, apart from that in other portions of the body, but from the experiments of Du Buât it is found to be, for mean velocities of about 3ft. per second,

$$u = (\sqrt{V} - 1)^2$$

When V = the mean surface velocity from side to side of the stream, which is always less than that in the centre or axis of the stream. In this case u and V are the velocities in inches per second. Mr. Beardmore adopted this rule in his hydraulic tables for velocities of from 1 to 15ft. per second.

Experiments which have of late been made upon the large American rivers show a different relation between the surface and bottom velocities.

In a discussion at the Institute of Civil Engineers in 1879, Mr. George Higgin said that in the experiments carried out under the direction of Mr. Bateman, Past-President of the Institution, on the great rivers of South America, certain new laws were discovered in the movement of large masses of water. One of these was that the surface velocity of water at a given inclination varied directly as the depth of the channel, and another was that the bottom velocity of water varied directly as the square of the depth. With a given volume of water passing at increasing rates of inclination, and, therefore with diminishing depth, it was calculated that at a depth of 27ft., and with a surface velocity of 176ft. per minute, the bottom velocity would be 69ft. per minute, at a depth of 21ft., and with a surface velocity of 241ft. per minute, the bottom velocity would be 72ft., and at a depth of 18ft., and with a surface velocity of 290ft. per minute, the bottom velocity would be 75ft.; thus, while the surface velocity increased 65 per cent., the bottom velocity increased only 10 per cent. But the question arises whether the rules derived from the motion of masses of water so vast as those of the American rivers are more applicable to the English, Irish, Scotch, and Welsh rivers, than the old formulæ are, confirmed as they have been by experiments on a scale of very considerable magnitude.

HISTORICAL DOCUMENTS.*

(*Concluded from p.* 356.)

THE Parthenon, the Pantheon, and most of the Egyptian temples which remain were preserved as Christian churches; the amphitheatres of Rome, Nîmes, Arles, and the theatre at Orange as Mediæval fortresses. We have emerged from barbarism and acknowledge the value of old building independently of their use, and would not now destroy the Parthenon or the Coliseum, though practically useless, yet an old building is more safe if we can find a use for it. But unless we act like barbarians we must not forget that it is an historical record, and we must leave it unused if its use involves alterations which injure its historical value. It is worth the cost. I can conceive no better employment of our wealth. Yet it is riches which is the great destroyer. The City Companies have latterly been employing their wealth in pulling down their old halls and building new ones, in destroying the few old buildings which remain in London, to increase their income from their sites.

The treatment of old houses is difficult. Changes may be necessary if a family is to live in them; but it would be better to keep them as ruins than make such changes as destroy their value as a record of the life of the old time. But that is not necessary: some use could be found for them, which, while giving a motive for keeping them in repair, would leave their historical value intact. The fashion which lately prevailed of making ruined houses and castles habitable has, in most cases, been more destructive to their value as documents than keeping them as they were. It involves their total destruction by renewal of their internal arrangements, the evidence of old manners and life by substituting for them modern conveniences, and when this is done they are more costly and inconvenient than new ones.

Many who possess old houses are willing to put up with some inconvenience, rather than injure their historical value by altering them to suit modern uses.

In churches a more serious question than mere convenience arises, for it is urged that all considerations must give way to the proper conduct of Divine worship. This plea is unanswerable. The new practices introduced in this generation into the worship of the church must involve some changes in the fittings. But it is made in excuse for changes by no means involved in it. One cannot ask a congregation who have ceased to feel the old custom of responses by the clerk a fitting mode of conducting service, to retain a three-decker pulpit which conceals the altar; but in this and similar changes is no reason why the walls should be stripped of their plaster, the old monuments torn down from them and collected in a batch out of sight; the floor, which was often a curious page of history, taken up and replaced by Minton's tiles; the rich classic oak panelling of the chancel removed; and even Perpendicular windows and roofs destroyed, because we dislike the style, for "extirpating without mercy." Incongruous insertions have nevertheless some intrinsic merit ("Church Restoration," p. 35), which Sir Edmund Beckett says, "is clear to everybody except the fanatical anti-restorationists, who are beyond the reach of reason, and only fit to rank with anti-vaccinators and objectors to interference with other filth."

This is a reckless assertion of such men as Poynter, Stacy Marks, Mark Pattison, Coventry Patmore, Aldis Wright, Robertson Smith, Percy Wyndham, Alma Tadema, Sir William Gull, Sir Charles Dilke, Birkett Foster, all members of the Society, as well as Thomas Carlyle, whose last public letter was a plea for preserving the work of Sir Christopher Wren.

Oak panelling and Renaissance tombstones on the walls are not incompatible with the new arrangements for the service, and we would honour God more, I think, by respecting the work of each generation who did their best to honour the church, than by thrusting it out by our own.

I shall not venture an opinion as to whether galleries and high pews are incompatible with Christian worship. High pews are out of fashion, but in the opinion of some both good architects and High Ritualists they have a better architectural effect than the benches usually substituted for them. In Wren's churches they are part of the architecture. Wren objected to pews, but when he used them he made them an essential part of the architecture of the church, and their destruction which is going on in the city churches is destruction of his design. They could be made into low pews by raising the floor more easily than by cutting off the top, or substituting new Gothic ones. Galleries are not found to be inconsistent with the service in those churches which depend for their incomes on pew-rents, and they are features of the great Byzantine and Mediæval churches. It is rather mistaken architectural notions which have caused their removal in our churches, with the result that the whole design of the church has to be altered, often spoilt, by a great addition to make up for the lost room. These galleries were often picturesque. They did not destroy, but merely overlaid the original design, which, with a slight effort of imagination, could be realised. I sometimes think that the desire for restoring springs from a lack of imagination, from inability to realise the old effect till it is actually completed and made out before our eyes. Hence the desire to have every bit of foliage, every break in a moulding completed and made perfect, just as many see no beauty in the Elgin marbles because the legs and noses are broken. They would like them restored, and being architectural sculptures probably would have been restored had the Parthenon been in England. At an earlier period even sculptors would have restored them, but their culture now prevents them. Many architects attain to the same pitch of culture before all the ancient buildings of the world are restored.

The plea of convenience goes a very little way to justify the usual mode of restoring churches, and there is still less ground for alterations in order to beautify them, even if we had the absolute confidence in our own taste possessed by Sir Edmund Beckett. He has no difficulty. He would "extirpate without mercy" anything he thinks ugly, thereby constituting himself the standard of taste, not only for the present, but for all time. This is not in accordance with the teachings of history, which shows that taste changes. The merits even of the despised Perpendicular may come again to be appreciated, and its destruction everywhere by restoring architects regretted. There are already signs of this in the practice of Mr. Norman Shaw, and others of our best architects.

But even if we could be as cock-sure as Sir Edmund Beckett, this gives no right to alter and falsify historical documents, even if we think it improves them.

I am not blind to the difficulty of preserving old buildings as historical documents. We cannot put them in a glass case in a museum. They become useless and unsuited to modern requirements, and cumber valuable ground; or, worse still, they decay, the floors get rotten, the rooms foul and fever-haunted, and they fall under the ban of the Dangerous Structures Act.

Notwithstanding all these things, if we

* Paper read at the Royal Institute of British Architects, March 28, by John James Stevenson, F.R.I.B.A.

thought them of sufficient value, these old buildings could be preserved. These things do not prevent our preserving older work which we think more valuable. The important thing is to keep old buildings in repair. A prop is better than rebuilding, and if they are so far gone that some renewal is needed, to remember that the old stones and timbers we can leave are, even if not perfect, better than new ones. Their preservation depends on our valuing them enough to stand the cost and inconvenience of keeping them.

Their chief enemy is the love of newness, the desire of change, which is pleased even when the change is for the worst, like the Shah of Persia, who, on returning home from his European tour, had the books in the royal library re-bound in modern European style, destroying beautiful old Persian buildings. How many of our restorations exhibit similar barbarism.

To such minds it seems absurd to prefer the old (?) to the new (?): the new is smart, bright, showy, complete; they cannot feel tenderness of age, or see the value of the records of history.

If old buildings are national historical documents, it is a fair question for argument whether any single architect, however able, should have the sole power of altering them. It is not unreasonable that the autocratic authority which an architect claims in his own original work should have some limitation in dealing with works which are not his. If doctors do not think it inconsistent with their dignity to consult with their fellows in the case of a patient, neither need architects as to how best to preserve a national treasure for future generations. There are few restorations as to which different views might not be taken as to what should be done. I have found curious proof of this. A society of architects, counting several eminent members of the profession in its ranks, makes an annual excursion to some ancient buildings. On the questions which occasionally arise as to their restoration, the views are sometimes as various as the members. All agree as to preserving them and keeping them in repair, but in the doubt as to the alterations necessary the concensus of opinion tends towards leaving them alone.

In many cases I have noticed that architects who have no scruples as to their own restorations, would minimise the extent of a restoration carried out by others, and this from no unworthy motive, but each man has his own idea as to what he would do; the old work is more interesting to him than the new work substituted for it, for it gives room for his imagination.

This may account for the strong feeling in this country against rebuilding the front of St. Mark's at Venice. While rejoicing in it I cannot quite understand it, while many restorations as destructive are going on here. It is said that an Italian committee has been formed for the preservation of St. Alban's. I wish it were true. I am sure we would gladly abandon Sir Edmund Beckett to them if they could make anything of him.

Unfortunately such discussions occur often after the restoration is done, and are as useful practically as a consultation of doctors after the patient is dead.

It would not be unreasonable to have such consultations as to national monuments before they were altered. Among other benefits it would relieve architects of having to do things of which they disapproved. Sir Gilbert Scott laments that he had occasionally to act against his opinions, lest if he threw up the work it should fall into less scrupulous hands.

The Society for the Protection of Ancient Buildings has had some experience of such discussions, the architects of restorations in most cases courteously admitting that these are questions of public interest as to which the public are entitled to express their views, but at the same time treating the building as they choose. In some few cases representations are treated with silent contempt or with resentment, more frequently, however, by the clergyman than by the architect.

I have sometimes wondered whether the influences of this Institute could be exercised in bringing about a discussion of restorations before they took place. Professional habits are against it; but it might be justifiable on the grounds that our ancient monuments are the property of the public and of posterity. The standing of the Institute would give weight and authority to its opinions, and I am confident that the more the question is discussed the more will opinion lean to preserving our old buildings as they are.

In a discussion on the subject, some years ago, one speaker asked whether the restorations of the last thirty years had not preserved more old work which, without them, would have perished, than they had destroyed by removal or alteration. I believe that utter neglect would have been less destructive than these restorations. What remained would at least have been authentic, not destroyed as historical documents by new work which we cannot tell from the old. But though neglect be less destructive than restoration, no one proposes it as the proper treatment for old buildings. Keep them in repair; keep them watertight; prop up the walls; rather do this than rebuild them. Do no mind them being out of perpendicular, if they are not insecure. Above all, let no architect take more restoration in hand than he can personally superintend and be responsible for. It is heartbreaking to one who reverences old buildings to see this treatment by country builders and clerks of works. I have heard of one architect who had actually a lithographed specification for his restoration, ordering the same destruction in every case of the ancient plaster on the walls, and removal of the old monuments; the same tearing up of the old pavements, and substitution of modern tiles; the same new scraggy brass altar-rails.

Why this hurry to get every church restored at once? Better wait and have it rightly done. It can easily be kept from tumbling down meanwhile. Why should this generation take upon itself the right of altering as it likes the records of every previous generation in English history, or, still less, destroy them as records by rendering them undistinguishable from its own?

What right has it to destroy everywhere the records of the last three centuries; to look on them, in the elegant language of Sir Edmund Beckett, as "rubbish that got stuffed into churches in the last century or two"?

One thing I am sure of, that unless the present continued destruction and alteration of old buildings ceases, our descendants will have hardly one left to look at. The whole records of the past will have become merely nineteenth-century records.

Each alteration, as it occurs, may seem of little moment; but the process is universal, penetrating, by the influence of the clergy, into the remotest localities. It is rampant in France and Italy and all over Europe; and soon hardly a building will be left a continuous and authentic record of the past. One City church a year pulled down, or its interior architecture destroyed by pulling out its old fittings, may seem of little matter; but this rate will insure the destruction of all of them in a short lifetime. It is false to plead spiritual benefit as a reason. The Eclesiastical Commissioners spend the proceeds of their destruction, and more, in restoring chancels and churches, which is too often only another mode of destroying them as historical documents.

In each case the architect may think he is giving a building handsomer and better than the old. I do not admit this. Restored churches have, without exception, a dull sameness which destroys their interest and makes us turn from them with disgust. Their colour and picturesqueness are gone, which were due to their imperfections, to the wearing of the stones by time, and the moss and lichens. What painter would think of making a picture of a restored church? But even if the restoration improve the building it is a loss to the country, for, in almost every case, it involves its destruction as an historical document.

I shall not insult the profession to which I belong by supposing that the common practice of restoration, which has played such havoc with old buildings, proceeds from love of gain. It is due to a mistaken method, old habits, and an unconsciousness of the ideas which are becoming more and more prevalent on it. Opinion, as indicated by the public press and many other ways, is going against the present practice of restoration, and more and more appreciating the value of old buildings as historical records, and I do not despair that even architects and the clergy may come round to this view before all the old buildings of Europe are destroyed as historical documents by restoration.

ARCHITECTURAL ASSOCIATION.

A SPECIAL business meeting was held on Friday evening, before the ordinary proceedings, to consider a proposed alteration to Rule 17, by which the entrance fee shall be increased from "10s. 6d." to "one guinea," it being suggested that the change shall take place at the commencement of next session. Mr. I'Anson, vice-president, occupied the chair. A long discussion took place. Mr. Gilbert Redgrave moved, and Mr. H. H. Stannus seconded, the resolution for the increase of entrance fee, which was supported by Messrs. R. E. Powell, H. W. Pratt, Jas. Smith, R. Phené Spiers, Tanner, Aston Webb, and J. D. Mathews, while Mr. Blashill led the opposition to the change, and was followed by Mr. Gotch. After 100 minutes' discussion, a show of hands was taken, when the resolution was carried by an overwhelming majority. Mr. F. E. Eales, hon. sec., announced that the next visit would be held on Saturday, the 9th inst. (to-morrow), at 3 p.m., when the church of St. Mary Overie, Southwark, would be visited.

SETTLEMENTS.

Mr. L. C. Riddett read, under this title, a paper which will be found on p. 387.

Mr. Blashill, in proposing a vote of thanks to Mr. Riddett, observed that he had given them a most interesting paper for such a class of subject, and had treated it in such a manner that it would benefit those who most needed such advice. It was not, however, an infallible preventive of "extras" that the client should go onto the Continent while the contract was in progress, as the lecturer had suggested, nor even that the architect should accompany him, for the speaker remembered that the work which ran him into the largest bill for extras was one in which the client asked him to join him in a tour. Whilst sitting at a *table d'hôte* in Switzerland, the client exclaimed, "I'll double the size of that house," and it was done.

Mr. Aston Webb hoped he had misunderstood Mr. Riddett in supposing that he had said that the charge for quantities had much better be kept from the client, and that the less he knew the better. This would be very dangerous advice to give young architects, and he had himself adopted the opposite course of explaining that quantities must be paid for, and had in the final settlement mentioned the fee. If any objection were raised, he suggested that the client should consult any architect in large practice. On the lowest ground of policy this was prudent, for there was always the possibility of a disagreement with the builder, who, if unscrupulous, might endeavour to shake the architect's credit by informing the client that the charge for quantities was included in the contract. A frequent cause of extras was that the trial borings on site were not sufficiently numerous to give a fair estimate of the nature of foundations. It sometimes happened that if extras were too carefully reckoned and settled as the work went on, the client had to pay at a higher rate than if he had waited till the sealed estimates were opened at the close of the contract.

Mr. Lacy W. Ridge said Mr. Riddett had not, he thought, advised the architect to conceal anything from his client, but he quite agreed with Mr. Webb that the architect should be scrupulously candid. A very unfair and untrue assumption was sometimes made that all builders were rogues; he had by no means found it so, and had been glad to hear Mr. Riddett condemn the supposition. He had found the most frequent source of extras to be the indefiniteness of requirements of the client, or rather of the client's wife, who would prowl about the work and suggest little alterations, in apparent unconsciousness of the fact that these must all be paid for. It was the architect's duty to point out to such a client the unreasonableness of expecting a builder to supply material or labour for nothing. As contracts were generally drawn up, there was room for great tyranny over the builder, unless the architect was careful to take an equitable view of the transaction.

Mr. H. W. Pratt believed that in practice, although architects might start with the resolve to give a written order for every alteration, yet this generally broke down as the work proceeded; perhaps, when an omission was proposed to be set off against an extra. Mr. Riddett had passed over the difficulty of "p.c. prices" rather lightly, but it was in practice almost impossible to get at the real prime cost,

as manufacturers countenanced discounts. He had found it best only to recognise the general contractor, and to take no notice of the sub-contractors.

Mr. Riddett, in reply to the vote of thanks, explained that Mr. Webb had misunderstood him as to the charges for quantities, and that he had distinctly advocated that the client should be informed of all the expenses he must meet. He remembered only one instance in which the client took offence, and that gentleman promptly struck the item of quantities out of the builder's contract as soon as it was shown to him, and to this day the quantity surveyor had failed to obtain payment. But such cases were rare. He thought most architects could speak well of builders as a whole; but if one should come across a bad specimen, a word was sufficient—one could not be too quickly down upon him. It was impossible to cast off extras accurately while the contract was in progress, or until the sealed estimates were opened. There was undoubtedly a great deal of difficulty in getting at prime costs; but he thought so long as the builder only asked a reasonable profit on his outlay, skill, and labour, no client could object. He had found it advantageous, while dealing with the general contractor, to recognise the sub-contractors in the various departments, and had learned very much from them.

SETTLEMENTS.*

I MUST admit that the title of my paper is ambiguous, and that it may be taken as referring either to the structural or to the financial meaning of the word. A paper on structural settlements by some one well up in the subject, would, I know, be interesting to many. More than one member of our profession would snatch a fearful joy from frank confession of failures in foundations; of the perverse conduct of piers; of the obstinate refusal of thin walls to conduct themselves as though they were thick; or of the lighter scantlings of timber to behave as do the larger. In confessing my own inability to share such pleasures, I will hope that I have not been guilty of alluring to this meeting any who may have attributed the more ghastly meaning to my title.

It is of financial settlements that I wish to speak. These must occur in connection with most of the buildings which come through your hands; I think these, therefore, should be of general interest. From the other sort I will hope that you may, with reasonable care, be delivered. If, however, you should not, you will find a few hints as to financial settlements all the more useful. What can be more distressing than to hear the ordinary views held by the outside public as to the financial powers of the architects whom they employ? Who cannot call to mind many instances of works where difficulties of plan, of design, and of construction, and even of the contract sum, had all been happily surmounted, but where the breakdown came with the bill of extras? Where the alienation of the client was accompanied by a suggestion that the swollen outlay was not so pleasing to him as it was to the gentleman who took five per cent. upon it? Where the unhappy architect was somehow or other credited with an innocent incompetency to fight a bill of extras, and, at the same time, with a kind of criminal adroitness and direct interest in causing it to come into existence. The opinion entertained by an ordinary outsider on the subject of extras seems to be that if any of his friends be about to build, they must make up their minds to an increase of say 100 per cent. upon the contract sum; but that if he himself enter on any building enterprise, his own case must be the exception by which the rule shall be proved. The outside public has received some little confirmation of its views in this matter by the recent experience of the Corporation of the City of London. It will be many years before it will let architects forget that one may start to spend £5,000 on a griffin and its surroundings, but ultimately find that he costs double that sum.

As to the circumstances which usually give rise to dispute about extras, I will quote Chief Justice Erle, who said:—"It constantly happens that in the course of the performance of a contract certain deviations and additions are required, and it almost as constantly happens that the contract contains a clause that the party who asks for these deviations and additions is not to be liable to pay for them, unless some condition is performed, which is to operate as a security for the price to be charged for them. But again, almost as constantly, the party who executes such order, trusting to the spoken words of the other, takes no care to see that the condition is performed, which is necessary to entitle him to payment." This "condition precedent" is, of course, the order in writing, always supposed to be the grand condition upon which extras will be allowed. This "order in writing" seems to be most systematically neglected in many cases. Perhaps from the sheer impossibility of keeping up any system of written orders. One often finds that, in the early stages of the job, they have been given with punctilious care; but, as the work goes on, can it be that the zeal slackens? Or that it is found impossible to say, off-hand, what is or what is not an extra? I think the latter cause may have a good deal to do with the difficulty. Still, I think, that the order for a "variation" might be given without having on the face of it an admission that an extra is to be incurred. I have seen more than one kind of lithographed form on which to order variations, the architect retaining the counterfoils; certainly a step in the right direction, and of great utility at the final adjustment. I have never seen any of these forms advertised by the law-stationers, but if brought out in some well-devised shape, I think they would command a ready sale. I shall have something more to say about the ordering of extras later on. I would here only point out that it is well to be consistent in this particular, if you can.

I will now deal with some of the most frequent causes of extras. The most frequent causes may, I think, be summed up as follows:—Want of foresight on the part of the architect; defects in his drawings and specification; defective superintendence; the client's interference. The first three seem to be avoidable causes; it would be too much to say the same of the last. Among extras caused by want of foresight I have observed the following chief offenders. Doubtless many others will suggest themselves to you. First, an insufficient survey of the site. This is one of the items for which an additional charge is recognised by the Institute scale, but in practice it is, I believe, very frequently thrown in with the five per cent. Perhaps on that account it is rather liable to be shirked. When building on an open site the levels are too often taken by guess. The buildings consequently are found to be too high or too low, to the extent of perhaps only a few inches, but just sufficient to cause an aggravating increase of expense, in making up surrounding levels, in finessing with drains, in getting out of difficulties with the damp-course, or in facing at the finish, and at serious extra cost, some parts of the external walls which were not originally intended to appear above the ground. When building on a site covered with or surrounded by existing buildings, plans, sections, elevations, and in some cases photographs of what already exists, can scarcely be too carefully or plentifully made before anything is pulled down. If these be shirked, and difficulties as to right of light or air or other easements spring up, these difficulties are much more troublesome to settle. It may be that the building either stands still, or is modified in its design, causing grievous disturbance of the contract and claims for all kinds of extras. The costs, too, of the lawyers whose aid has been sought by or thrust upon the client and his neighbours, are sure to be reckoned as "extras"—and so they are. I think the record of buildings which are to be replaced by the new can scarcely be too perfect. And while on this subject I would say that where additions to and alterations of existing buildings are intended my remarks apply with equal force. Another cause of extras is want of foresight in finding out the nature of the soil. Too often it is assumed to be just like that of some adjoining owner. The evidence of a labourer who once saw a well dug out, or a sewer driven through, in the vicinity of the site, is trusted to. When you come to build, you find, perhaps made ground, perhaps springs, perhaps a seam of clay where gravel was expected. A few trial-holes would have solved the question—good deep ones, going lower than the level at which it may be intended ultimately to stop, so as to know all about the subsoil. In our metropolis particularly, where it is often necessary to reach the London clay at a very great depth, this precaution is specially useful. A case occurs to my mind where the trial-holes revealed the existence of a portion of a disused burial-ground, and great indeed would have been the difficulties of the settlement but for this discovery. Foresight in getting information as to local building regulations, which are sometimes more rigid than those of the metropolis, may save a good deal of expense. Foresight, too, as to the level of public sewers seems too obvious a matter to refer to. Yet, quite recently, I heard of some houses which could not be drained, except at heavy after outlay, because the architect had either not tried to discover the level of the sewer, or, which is quite likely, had been misinformed with regard to it.

Then as to the trouble caused by defects in the preparation of the drawings. I do not believe that the blame is to be altogether, or even chiefly, visited on the architect, although he is, of course, actually responsible for them. Given unlimited time and unlimited staff, and there would be very little trouble arising from this source. Hurry is the bane of the architect, and is generally forced upon him by his client. It is strange to see some sober citizen, who, in all ordinary affairs of life, acts with the greatest deliberation; who will watch and wait upon a market with untiring patience, will invest his money only after the most mature reflection, will, even in the selection and purchase of the site, show the most perfect self-control; but who, having selected and paid for it, appears in quite a new light. From that time forth until the house is up, he is in what I have heard well defined as a "jackass hurry"—an expression which seems to commend itself as a kind of expletive which escapes the charge of profanity. One does not observe the existence of this passion until a man comes to deal with bricks and mortar; but the cases are quite rare, in my experience, where it is not developed by building operations. But there are other defects in drawings which I think lead to trouble at the finish, not due to hurry so much as to bad style of preparation. Drawings in which the power of drawing would seem to have been exercised chiefly for the concealment of the intentions of the draughtsman; drawings where artistic power is largely developed in the direction of skirtings, of architraves, of tile pavements and enrichments, to the neglect of the weightier matters of construction; drawings which, on the other hand, show too little, and where, from lack of knowledge or of enthusiasm, the sections are artfully taken through the least interesting portions of the plan; drawings prepared for the purpose of a competition, but not subsequently reduced to the level of common sense; drawings without figured dimensions, and which yet do not yield accurate results on the application of the scale; drawings made by much subdivision of labour, but at the cost of harmony between plans, sections, and elevations; general drawings deficient in large scale details—and even in some cases details deficient in general drawings! All these and many other sorts of defects lend themselves to the manufacture of extras, because they all tend to make the basis of the contract shadowy and insecure. I have noticed the best results ensue where the general drawings have been made to a small scale and left in pencil, while the details to larger scale are being made. The small-scale drawings are then corrected wherever the making of the details has revealed some needed alteration (as it generally does), and the whole become part of the contract. I know how difficult it is to carry out this method in many cases, but I have certainly found it to be the best. I do not say that perfect drawings are a safeguard against extras, but we all know that they go a very long way to prevent them.

As to defects of specification, I have less to say on this head. No doubt, defects in this document do largely conduce to cause doubts and difficulties which (in spite of some ingenious and inequitable clause to the effect that all matters omitted are to be considered as included) are sure to have their influence on the settlement. But the author of really good drawings will not, I think, break down over his specification, provided that he has worked on the lines of some good model, and, having adopted a system, consistently followed it up and improved on it. There is a style in specifications just as there is in drawings. Conciseness is dearly gained at

* A paper read before the Architectural Association by L. C. Riddett on the 1st inst.

the sacrifice of clearness, and clearness is imperilled where there is great verbosity. This sounds very commonplace; but I think it contains the general principle involved, which is all that I have space to set forth within the limits of my paper.

Defective superintendence of the works, especially where the works are at a considerable distance, where, moreover, there has been a little display of the weaknesses above referred to, and where the builder is not clever or possessed of a clever foreman, is another cause of extras. The blunders accumulate, and have to be corrected, and the settlement for extras such as these is not rendered the more agreeable by reason of their generally forming the subject of the familiar "voucher," with its mysterious prodigality in the matter of pecks of plaster, and bushels of cement, and hods of mortar, and much painful evidence of the small amount of work that can be done in an hour by a British workman, notwithstanding the advantage of a steadily-attendant labourer to stand by and see him do it. Difficulties under this head do not, of course, arise where the job has the benefit of a good clerk of works. He can generally ward them off; but if by chance they do crop up, I cannot say that I have often found him able to exercise any very accurate control over the voucher. Perhaps his time is too much taken up with other matters. Perhaps, if it were not, the task would exceed the powers of a man who might be an excellent judge of work, but not good at checking accounts. When he is good at both he is a very strong man, and I am afraid you will not be able to secure his services until you have got some way beyond the stage at which I venture to advise you.

The foregoing causes of extras are avoidable. The other cause,—the client's interference,—can hardly be included in the same category. I speak of the ordinary client. There are some (very rare birds indeed) whom one gladly calls to mind as brilliant exceptions. An eminent architect (who has visited and addressed us here) has often said, in my hearing, that the most satisfactory results he had achieved were in cases where the client saw least of the work as it went on. Perhaps it is only an eminent architect who can take that line. Younger ones may not be so experienced at seizing or interpreting their clients' requirements, or so sure of his seeing their work through rose-tinted spectacles at the finish. But as to the financial result, I think there can be very little doubt that a tour on the Continent during the progress of the job would be very beneficial both to the client and to the contract, where expense is a matter of supreme importance. Where clients exist in the form of a committee or body corporate, the idea of temporary expatriation is hardly feasible. In such cases I need scarcely point out that the authority for extras and alterations is apt to be questioned by the authors, and that the record cannot be too carefully preserved if the architect is to escape the blame, or if the builder is not to escape the payment for them.

(*To be continued.*)

HINTS ON HOW TO OBTAIN BY COLOUR PICTURESQUE INTERIORS.

By Thomas Bonnar.

THE practical working out of this subject—which has capabilities of adaptation to a very great variety of systems of treatment—bestows on it the advantage of forming a topic fruitful of much divergence of opinion and discussion. Consequently, it has become the basis of an unlimited amount of theorising.

To examine the question properly, we must go back to the origin from which competent authorities draw their proofs of the use of colour in its truest and purest aspect. Take, for instance, those exquisite examples which are furnished to us by the mural paintings of Pompeii. There we find the people constructing their houses in narrow streets, and carefully excluding the overpowering rays of the sun, with which they were familiar enough, when business or pleasure called them to the fields or the sea-shore. In their houses they wished to secure the means of enjoying that mental and bodily repose, which is so requisite and beneficial to exhausted nature. And they found it in the subdued light and atmosphere which they had created for themselves within doors; and by the use of bright colours, that were nstrumental in producing richness and brilliancy, and at the same time bestowed an air of refreshing repose, which it would have been impossible to have effected, had too much light been allowed to predominate. Under most circumstances this modified light is preferable to glaring sunshine; as the fact of light being subdued should not be supposed to suggest any feeling indicative of monotony or even a paucity of the correct elements constituting repose.

All practical people will readily admit that strong glaring light is neither a promoter of nor an aid to a studious disposition, for undoubtedly the mental faculties, when in full action, are in a manner disunited from the operation of external activity. In short, the essence of decorative art is the realisation by the effects of colour of an atmosphere calculated to produce spontaneity and harmony of emotion in the mental powers, aiding by its sympathetic action the free operation of all the functions conducing to mental enjoyment. In our climate, for a few months, we have no doubt a succession of bright sunny days; but for the greater part of the year, we are surrounded by a greyness and sombreness of light and atmosphere which are neither conducive to cheerfulness of spirits nor to healthiness of body. Therefore, from the very want which we experience of what the more fortunate inhabitants of southern countries have in excess, we might reasonably be expected to resort to artificial means for obtaining the light and warmth requisite. This can be accomplished by the use of those bright and warm colours which the citizens of Pompeii were so successful in adapting to their varied requirements.

It must be obvious to every one that if good results are to be obtained, and that subtile quality of effect secured by the action of colour, that the numerous harmonies involved in its construction cannot be the outcome of mere chance. They must be the result and operation of most careful study and calculation, and to those who are fortunate enough to understand the value of that knowledge, the picturesque will not only be retained in their social surroundings, but they will also become aware that in the perfection of design and colour, which their skill has matured, there will likewise be found co-operating the possibilities of the highest forms and principles of art-knowledge.

Before going further, it may be concisely explained here what I mean to convey by the word "picturesque," as it applies to this subject. I intend that it shall be understood to denote what the eye conveys to the mind as an agreeable and pleasing sensation, and as possessed of sufficient coherency to embody thoughts which shall acquire significance to the understanding of the observer. That the presence of a simple colour, or even sense of colours, can produce what I have defined as "picturesque," would be needless to suppose, although it must be conceded that as soon as form is added, light and shade are introduced, and pictorial effect is thereby immediately put in operation. This may properly be looked upon as the elementary stage of the higher forms, and although merely a preliminary step, it is by no means an unimportant one; as it indicates the presence of the faculty of perception of beautiful forms individually, and leads onward by a process of education, until the ability of grouping and massing the separate shapes is acquired.

I may just say a word or two respecting the importance which is frequently attached to individual articles on account of their costliness.

There is oftentimes a glaring absurdity displayed in relation to accessories of furniture. For, in the first instance, as we are well aware, expensiveness is, by no means, a proof, either of the intrinsic or artistic value of an article. And secondly, a reckless want of consistency is too often exhibited by dealers in those things, recommending too costly materials without the slightest thought or consideration of the social position of their clients or their relation in life—points which are of vital importance to the general success of a carefully developed and artistically executed design.

It is to be much regretted that the evil referred to is one of no uncommon occurrence, and it cannot fail to create a spirit of repugnancy in the minds of all possessing a correct sense of fitness even in the presence of auxiliary artistic details in themselves successful.

Thus we perceive that the efficient decorator, like a skilful pilot, has not only to be accurately informed of the bearings which lead easily and safely to the desired destination, but also of those which indicate difficulties and dangers which are to be guardedly avoided. And we must acknowledge that any failure in obtaining a full sense of completeness within the sphere which, in many instances, comprises the area of our daily lives, would be conducive of most irksome and intolerable results. We now come to the important point relative to the lighting qualities, and the adaptation of the colouring of the apartment to suit the double requirement of daylight and artificial light. Daylight is the most difficult point to manage. With steady sunshine, a just disposition of rich colouring in combination with the usual accompaniments of a well-appointed room, would be sufficient to realise a successful effect. But with the prevalence of the cold, grey light which predominates with us, suitably-coloured hangings, formed either of opaque or transparent material judiciously employed, are of great value when assisted by tinted glass in the windows. The ceilings and walls should be appropriately coloured in rich tints, with just enough gilding to give quality to the colours. The recessed parts of ornamental cornices and other structural details ought to be illuminated with still richer colouring. Then we have the covering of the floor to deal with, as being next in importance, from its mass.

It should represent a radiance of colouring, leading up either to the woodwork or walls, although this is generally more associated with the walls.

In this connection it is of material consequence to have a margin of colouring round the floor of the room, outside of the carpet, and of a proportionate breadth; as by this means we obtain an apparent increase of breadth and height in the room, the eye accepting the limit of the carpet as the floor proper. It has also the advantage of rendering an air of light and freedom.

By the effective application of stained glass, textile materials, and artistic colouring alluded to, the cold greyness of the light can be transformed into a soft ethereal atmosphere by a skilful combination of the prevailing masses of tints; the whole, of course, being carefully regulated by the special points of colour and form imparted by the accessories of the room, whether of furniture or works of pictorial art.

Then, again, we have examples of the use of white in decoration. And this we might presumably be expected thoroughly to understand, from the length of time it has been so generally in use. But it is actually one of the mediums which appears from observation to have been employed in a most ignorant manner. Granted that it is a very difficult—although seemingly simple—colour to handle, still, like all others, when systematically arranged to illustrate simplicity and severity of treatment, it can be utilised in an exceedingly picturesque way. But it is an essential principle that every detail should be rigidly adjusted to suit, as in the Adam or Chippendale forms of furniture. The ceilings ought to be finished in white, also the cornices. The latter should be in plain moulding, entirely divested of enrichment, then a frieze, terminating with white moulding; the intervening or upper wall-space covered with chintz paper-hanging, having a constructive moulding also in white, separating it from the surbase, which should be done in tinted Indian matting, with the skirting in white, the woodwork being likewise done in dull white, embellished with burnished brass mountings. The prevailing tone of the carpet might be green, or possibly a neutral blue felt might be advantageously used, and a margin round the floor stained and waxed.

For the fireplace an appropriate chimney-piece of the Adam type, the sides being lined with suitable tiles, a dog-grate, with brass fender completing this part; the furniture covered with stamped velvet of a uniform tint to contrast with the carpet, and the curtains of the same material or cretonne, edged with lace, and suspended from thin brass poles.

On the lower part of the windows there might be half-sash blinds made of Madras or figured muslin, fitted on brass rods, while the upper sashes could be made to enhance the general effect by the adoption of stained or coloured glass.

* Part of a paper read before the Edinburgh Architectural Association on March 30.

A few richly-coloured Oriental rugs scattered about the floor, and select specimens of china, and Strange's and Bartolozzi prints, in plain ebonised frames, with one or two choice examples of Dutch delft placed here and there on the walls, or arranged in cabinets, aided by the introduction of a brass sconce or two, would make up a composition for a room which, while perfect in taste, would be both pleasant and picturesque to the mind and eye.

Treating of lemon-yellow in its application as a medium for decorative purposes, it requires an exactly opposite treatment to that just spoken of: all its auxiliaries should consist of rich tones of colour and gilding. This rule also applies to its two complementary primaries, red and blue, and these, when rightly adjusted to the light of an apartment, are better suited than any other tints for backgrounds, either for furniture or pictures. Next in value comes green, and all the other tertiaries are capable of being employed either in masses or in subordinate details. But they are necessarily tamer and more opaque in their operation than those colours of which they are modifications.

Now, herein lie the special functions of the decorative artist, and the distinctive operative quality of his studies. He endeavours to realise continuity of expression, by blending in their separate parts the entire assemblage of forms, colour, and textile subjects, which go to render his complete work a success.

Another important feature which falls to the decorator to deal with, is the form of the apartment. An L-shaped room, or one with recesses, furnishes capabilities of receiving a variety of effects by the natural action of light and shade, as well as from the important circumstance that the eye of the observer is not competent to take in the entire range of the room at one glance, thus causing a feeling of expectation which is usually more grateful to the mind than any pleasure or enjoyment that is of too easy access, and therefore soon exhausted — the inevitable result of a square or oblong-shaped apartment. Although by their mode of handling such-like uniform subjects the resources of the decorative artist can be best displayed, there being no opportunity for accidental effects of light and shade to emanate from the natural forms, the decorator is called upon to exercise his powers of invention, in order to make up for the deficiency. This can be accomplished in a variety of ways, such as breaking up the lines of the walls by dadoes composed of raised flocks, leather, or other irregular surfaces; also by working-in artistically-designed mirrors, with bevelled-edged plates, supplemented with shelving, to receive vases or other objects of virtu.

Then there could be an elegantly-constructed gallery or shelf, of light proportions, placed around the walls at a suitable height, for the display of china or delft ware or other ornamental articles, the doors being so contrived as to form points in the decoration by their being embellished with handsome capes.

Thus those parts only would be utilised which are most available for decorative purposes, leaving ample space for the introduction of pictorial art—an important adjunct in the work of interior adornment. Besides, in the angles formed by the walls, brackets of an ornamental character might be judiciously placed. The application of decorative brasswork, such as lamps or gas-brackets, in harmonious design, and fixed at proper distances on the walls, along with a due proportion of similar metalwork on the doors and shutters and at the firplace, in conjunction with tiled hearth, should not be overlooked in the arrangement of artistically-designed composition, as they play a very material part in making it comprehensive and complete. They also give a quality and richness to the other constituents, on the same principle that we work upon when we apply gold to enriched cornices, to define the lines and light up the masses.

Then we have the chimney-piece, which is obviously expected to perform a most important function. Being the source whence warmth is diffused throughout the apartment, it becomes a centre of attraction from physical requirements, and it ought therefore to be made worthy of increasing our intellectual pleasures, by its design and details expressing at once a unity and conformity with the other parts, architectural and decorative.

Of course it must be borne in mind that the description I have endeavoured to convey in this verbal sketch, is only an indication of the endless train of ideas which unfold themselves to the mind's eye, and could be brought to bear in a relative sense from the sources referred to, in the artistic handling of such an apartment to a degree that could only be limited in accordance with the resources of the client's purse.

Doubtless, after all, for the ordinary purposes of every-day life, simple and harmonious treatment in the embellishment of our interiors is preferable. And with the materials ready to our hands, and which are for the most part inexpensive, it is surprising what results can be obtained, when worked out methodically and studiously, and what an amount of gratifying satisfaction is capable of being conveyed by this means to the appreciative eye. For on entering an apartment where this latter style prevails, it will be found on examination that the happy result does not flow—as many might be led to suppose—from the action of individual parts of furniture, however handsome they may be in design and material, although they perform their part in making up the picture. Neither does it arise from the use of costly fabrics employed for coverings, conscious though we are of the valuable aid they lend to the general air of completeness, by producing a concentration of richness over the whole. It is from the wall or mural treatment that the harmonious tone issues. It pervades everything, and is felt everywhere. The shadows which would otherwise be harsh and crude, are by its influence toned down and mellowed. While, at the same time, brilliant lights, which would have appeared like distinct forms, and become offensive to the repose of the room, are modified by the reflective quality of the luminous walls, acting as an atmosphere in conferring the just power and activity to those parts which are expected to occupy a prominent place in the service of home requirements.

In conclusion: Respecting the manipulation of colours, to obtain the result indicated, the necessity of their nice adjustment will be acknowledged; also the imperative requirement of carefully considering the various conditions under which they ought to be employed. It is obvious, however, that the motives by which the relative proportions are governed are not dependent on any law of a hard and fast nature. From this circumstance, and as already stated, in interior treatment, there are incidental conditions constantly occurring and making a demand on the artistic powers of the decorative artist.

THE AURIOL MEMORIAL WINDOW.

A MEMORIAL window to the late Rev. E. Auriol, rector of St. Dunstan-in-the West, Fleet-street, has been in contemplation by the parishioners of that church, and five designs have been submitted in competition, which were on view during this week. We have been able to see four of the five designs, and these were distinguished by letters. The window, to be filled with painted-glass figure subjects, is of Perpendicular character, the tracery of the head leaving rather small and awkward-shaped openings for the glass. This difficulty has been met by introducing figures of angels, while the three main lights have been treated in nearly all cases with figures of the Saviour, the Virgin, and the Apostles, illustrating incidents in the life of Christ. Design marked A has the centre-light filled with Christ with an infant in His arms, while the side openings show Him blessing little children. The lower panels of these lights illustrate the Return of the Lost Sheep. The colouring is rather vivid. Design B has the centre-light occupied with the Ascension of the Saviour, the Apostles being introduced in the side compartments. The decorative accessories and the colouring are in harmony. Design C has the Virgin and Child as a central subject, the side compartments representing the Birth of Christ and figures of the Wise Men with offerings. The author of design D is more realistic in treatment, but is cleverly worked out in the figures, and the colours are happily blended. Our application to see the selected design, now in the hands of the architects, Messrs. Fowler and Hill, of Serjeants' Inn, was refused, though on what ground it is hard to say, unless the committee desire to avoid public criticism on their selection. The tenders for the window appear to have been close. The window, we understand, is to be placed in the south-east apsis, the gallery in which is to be removed, and the groining above slightly altered. It is contemplated to insert a stained-glass window in each of the other sides of the octagon, and the removal of the galleries will add much to the appearance of the edifice internally—itself a rather remarkable example of planning contrived to meet the exigencies of a cramped site.

THE LATE MR. J. F. GOULD.

A TALENTED and comparatively young architect, Mr. John Ford Gould, of Barnstaple, died suddenly at the Horse Shoe Hotel, Tottenham-court-road, W.C., on the 30th ultimo. Mr. Gould was the son of Mr. Richard D. Gould, the present borough surveyor of Barnstaple, and was at one time a pupil of Mr. William White, F.S.A., of Wimpole-street. From an early age he showed great artistic talent, and his wonderful eye for colour, and the beauty of his mouldings, have been marked features in all his works.

Mr. Gould particularly devoted himself to church-work, and his restorations were numerous, especially in North Devon, where he has left his mark in many places. The best of his works, perhaps, is Winkleigh Church, restored in 1873, and in reference to this work Mr. Street, R.A.—although personally a stranger—addressed to him at the time a letter of congratulation. Mr. Gould had been consulted about restoring a church at Bristol, and going there last Monday week, he went on thence to London the day after, and was found dead in bed at his hotel the next morning. He was a little over 40 at the time of his death, and was never married. His last work, Sheepwash Church, is to be opened in a few days.

CHIPS.

Mr. Ernest E. Pither, whose name we have already had occasion to bring before our readers, in connection with several architectural specialities, requests us to notify that, owing to the increase of his business, he has been compelled to remove from 4, Newgate-street, E.C., to more spacious premises, and has formed, at 53, Mortimer-street, Cavendish-square (the London office of the Gateshead Stained Glass Company), a decorative art studio, where many things will be found which will amply repay a visit.

A lecture-room and other adjuncts are about to be added at the rear of the Presbyterian Church, in Ipswich, from the designs of the architect of the church, Mr. Frederick Barnes, of that town.

An infirmary for 400 patients is about to be erected at Croydon, from the plans of Messrs. Berney and Monday, of Croydon.

Col. W. S. Trevor, V.C., Royal Engineer, has been appointed Director-General of Railways and Deputy-Secretary to the Government of India in the Public Works Department, on the retirement of his brother, Major-General J. S. Trevor, R.E.

The foundation-stone of new schools in connection with St. Mary's Church, Bishophill Junior, York, was laid on Monday week. Mr. Simpson, of Priory-street, York, is the contractor. The buildings will be of red brick, and adjoin the west-end of the church; the main school-room measures 50ft. by 30ft.

The City Griffin will not for the present at any rate be compelled to vacate his uncomfortable perch. The member of the Court of Common Council who had brought forward a resolution on the subject, withdrew it on Thursday last, openly admitting that he feared "to play into the hands of avowed enemies of the Corporation, such as Mr. Firth." The fate of the uncouth monstrosity is but delayed.

The directors of the King's Lynn Coffee Tavern Company have adopted the plans of Messrs. Adams and Son, architects, for a new tavern in St. Ann's-street, upon land they have purchased there for that purpose. The new building will be upon a large scale, containing, in addition to the ordinary accommodation, billiard and other rooms, and a number of sleeping-apartments.

"Lincrusta-Walton," the Sunbury wall decoration, has obtained a first-class award at the Melbourne Exhibition.

A stained-glass window, by Messrs. Wailes and Strang, of Newcastle, has been placed in Redcar Church, in the North Riding. The subject is taken from Matt. xxv. 35, 36.

A new burial-ground at Singleton, near Chichester, was consecrated last week. The building works have been carried out by Messrs. Poate, of Westbourne.

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ILLUSTRATIONS.

DESIGN FOR A CATHEDRAL CHURCH.—OFFICES FOR THE NORTHERN ASSURANCE CO., NEWCASTLE-ON-TYNE.—STABLES TO HOUSE AT BALHAM-HILL.—OLD FIREPLACE, "OLD COCK" HOTEL, HALIFAX.—TYNECASTLE TAPESTRY.

OUR LITHOGRAPHIC ILLUSTRATIONS.

NATIONAL SILVER MEDAL DESIGN FOR A CATHEDRAL.

The drawings which we have reproduced to-day are those for which a National Silver Medal was awarded to Mr. Gilbert S. Doughty, student of Nottingham School of Art, at the last national competition held in connection with the Science and Art Department. When the drawings were exhibited last autumn at the Albert Hall, we remarked upon the whole series. No architectural drawings, however, were equal in merit to those contributed by the students of the above school.

NORTHERN ASSURANCE COMPANY'S OFFICES AT NEWCASTLE-UPON-TYNE.

These offices occupy a commanding position at the corner of St. Nicholas-square and Collingwood-street. The frontage is of rubbed ashlar, and the door case of dark-red granite. The company's offices are on the ground-floor, with strong-room, lavatory, clerks' room, &c., in the basement. The remainder of the building is occupied by suites of offices, with a house for the caretaker at the top. The whole building work has been well executed by Mr. Robert Whichello, of Newcastle, and the carving by Mr. G. Milburn, of York. Messrs. Austin, Johnson, and Hicks, of Newcastle, were the architects.

STABLES TO MALWOOD HOUSE, BALHAM-HILL.

A peculiarity with regard to these stables is that although they are being built within 10ft. of a public road at Balham, on land under the supervision of the Metropolitan Board of Works, yet they are exempt from the Metropolitan Building Act. This being the case, the architect has had the rather rare opportunity of building a country stable in the midst of Londoners, and the contrast between the building and those around is rather striking. The materials used are red brick and tiles; the plaster work in the gables is rough-cast, which has been very successfully managed, and has dried a perfectly white colour. All the woodwork is stained dark, but the general dark colour of the building is well relieved, not only by the rough-cast in the gables, but by the band of buff terra-cotta, 2ft. 6in. deep, which runs all round the building between the red bricks and the tile-hanging. Instead of the coach-house doors being hung, and thus liable to being blown to pieces with the wind, they run one behind the other on Hatfield's patent moving axle rollers. The wheels were supplied by Messrs. Hart, Peard, and Son, of Wych-street, Strand, and the whole works are being executed by Messrs. Bowyer Bros., of Upper Norwood, for the sum of £750. Mr. Arthur Cawston, of 11, Clement's-lane, E.C., is the architect.

OAK MANTEL-PIECE, "OLD COCK" HOTEL, HALIFAX.

This mantel-piece is in the banqueting hall of the "Old Cock" Hotel, Halifax. Upon the upper side of one of the mouldings is the date of 1581. The carving is a fine example of the work of that period. The armorial bearings of the Savile family are worked above in stucco.

J. F. W.

TYNECASTLE TAPESTRY.

The term "Tynecastle Tapestry," coupled with a device, constitute the trade-mark of a new material for the covering of walls, dadoes, friezes, panels, ceiling, &c., which is the invention of Wm. Scott Morton, of Edinburgh. The tapestry is a rough embossed canvas, stiffened with a backing of strong paper, and is particularly suitable, on account of its texture, for producing pleasing artistic effects with comparatively little labour, while its toughness renders it very durable. The embossing of the canvas is attended with difficulty, owing to the unyielding nature of the fabric, but under certain conditions, as much as half an inch of relief can be obtained. The tapestry is fixed on walls with ordinary strong paste, and is prepared so as to hang without any shrinkage, and may be decorated before hanging, or afterwards, and in the case of panelled work, sheets can be made up to any ordinary size, and fixed to frames, or pasted to walls, as may be desired. In the hands of some high-class decorators who are using the tapestry, a great variety of effects are being produced, from simple enamelled treatments in soft colours for picture backgrounds, to richly lacquered work, after the style of old leather. It is also being applied in a variety of ways in the embellishment of ship-saloons, and is so prepared and fixed as to resist the action of sea-water. The material is produced generally in 2ft. widths, and in height to suit the length of walls, thereby avoiding waste in matching the pattern. Extra widths from 3ft. to 5ft. can be supplied for dadoes, &c. For the walls of large apartments in mansions and public buildings, this tapestry is particularly suitable, owing to the wide range of design which can be obtained, a single repeat of the design being capable of extension to 12ft. by 5ft. The tapestry is manufactured at the Albert Works, Tynecastle, Edinburgh.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Birmingham Architectural Association.—On Saturday afternoon last a visit was made to the new Church of Saint Alban, in Conyberestreet, the architect of which is Mr. John L. Pearson, R.A., F.R.I.B.A. The Clerk of the Works, Mr. N. W. Vickers, met the members, and conducted them over the building, which is now approaching completion. The church is to be opened in May.

CHIPS.

During the past fortnight new schools have been opened by the London School Board in Wornington-road, Portobello-road, Notting-hill, and Bolingbroke-road, Battersea. Schools are structurally complete, and are about to be furnished and fitted up, in Gloucester-grove East, Chelsea, which contain 600 school places; Duncombe-road, Finsbury, 1,198 places; Goodson-road, Rotherhithe, 800 places; and the Poulteney school, Berwick-street, Soho, 1,000 places. These schools are all erected upon the plainer system recently necessitated by the £10 limit per head of the Education Department, and are from Mr. E. R. Robson's designs.

The Sunday-schools attached to Silver-street Baptist chapel, Taunton, have just been reopened, after enlargement and improvement. The work was carried out by Messrs. Samson and Fox.

The memorial-stone of new Wesleyan schools, about to be erected at the rear of the Hannah Memorial Chapel, Lincoln, were laid on Monday week. The buildings will cost about £1,000, and are being erected from the designs of Messrs. Bellamy and Hardy, of Lincoln, by Mr. Wright, contractor, of the same city.

The town council of Glasgow have granted a site for a bronze statue of Dr. Norman Macleod, opposite the Barony Church, in Castle-street. The statue has been modelled by Mr. Mossman, sculptor, of Glasgow, and the subscribers received a report on Friday that it is almost ready for casting.

The Farm Homestead, at Shorthampton Farm, near Charlbury, Oxon (recently destroyed by fire), is being rebuilt. Mr. Alfred Groves, of Milton-under-Wychwood, is the builder.

THE CRYSTAL DAMASK PAPER.

We call the attention of our readers to the "Crystal Damask" wall papers now being manufactured by Messrs. Cunnington and Co., of Park Walk, Chelsea, S.W. These hand-printed wall-papers promise to supersede the ordinary papers for decorative and other purposes, both on account of their crystalline surface, durability, and artistic treatment. The "crystal surface" is prepared with a mineral substance, which not only reflects the light, producing a varied play of light, shade, and half-tint at every turn, highly conducive to light rooms, and also to the beauty and colour of the patterns; but is impervious to dust and dirt, and the injury arising from gas-burners. The colours are permanent and free from arsenic, Several specimens we have seen are very effective. One of an amber-colour covered with a floral pattern; another in which a leaf-pattern in a sort of sage-green is printed negatively on the crystal surface; a beautiful silvery grey paper. These are well worth the attention of architects and others who desire harmonious gradations of colour, suitable for almost any furniture. The "passiflora" pattern, printed on one paper made by this firm, is particularly rich and striking in design. Positive and negative patterns are both made to suit individual taste. For dados the dead surface is preferable, as it is more solid, and well supports the crystal filling above. Many architects have already used these papers for important mansions, but the prices are so moderate that they may be used with advantage in the decoration of ordinary houses.

COMPETITIONS.

Edinburgh.—Some months ago competition plans were asked for a church for the Colston-street U. P. Congregation, Edinburgh, and in answers over 20 sets of designs were submitted, some of them being from architects in Glasgow. After some discussion three plans were selected for further consideration, and on Monday night last the congregation met and unanimously agreed to adopt the design recommended by the managers and the Church Extension Committee of the U. P. Synod, and which proved to be by Mr. Andrew Dewar, architect, Edinburgh. The plan of the selected design is in the shape of a horse-shoe, and accommodates 500 on the ground floor and 300 in the gallery. The site being a corner one, the main entrance will be on the angle; but there are also two side doorways for exit, thus providing ample egress in case of panic. Behind the church there is accommodation for vestry, session-house, and keeper, and the whole is connected with the Hall at present on the ground and now used for worship. The design is Early English Gothic, and shows an imposing entrance doorway with large wheel window over, and finished with a tower about 90ft. high. The front to each street shows a gable with a large traceried window forming a prominent feature. The cost is estimated about £3,500.

Newbury Drainage Schemes.—A special meeting of the Town Council was held on Wednesday week, to receive the report of Mr. Law, C.E., on the numerous plans which had been sent in for the drainage of the borough, in response to an advertisement offering a premium of 100 guineas for the best plan, and 50 guineas for the second best. Mr. Law reported that the first premium should be awarded for the plans bearing the motto of "Westminster" and the second premium to the plans marked "Final."

South Stockton.—The designs of Messrs. Weatherill and Moses, Stockton-on-Tees, have been selected in competition for the new Wesleyan Chapel and Sunday Schools about to be erected at South Stockton. The chapel will accommodate 1,000 persons, and the school between 400 and 500. The estimated cost is upwards of £3,000.

Alterations and additions in the shape of new screens, choir-stalls, pulpit, vestry, east window, &c., are being carried out to St. Thomas's Church, Redbank, Manchester, by Mr. Charles Heathcote, architect. Mr. Wm. Honey is the contractor for the work.

The tender of Mr. Alfred Groves, of Milton-under-Wychwood, has been accepted for proposed additions and alterations to Eastbank Rectory House, Gloucestershire. Messrs. F. T. Waller and Son, of Gloster, are the architects.

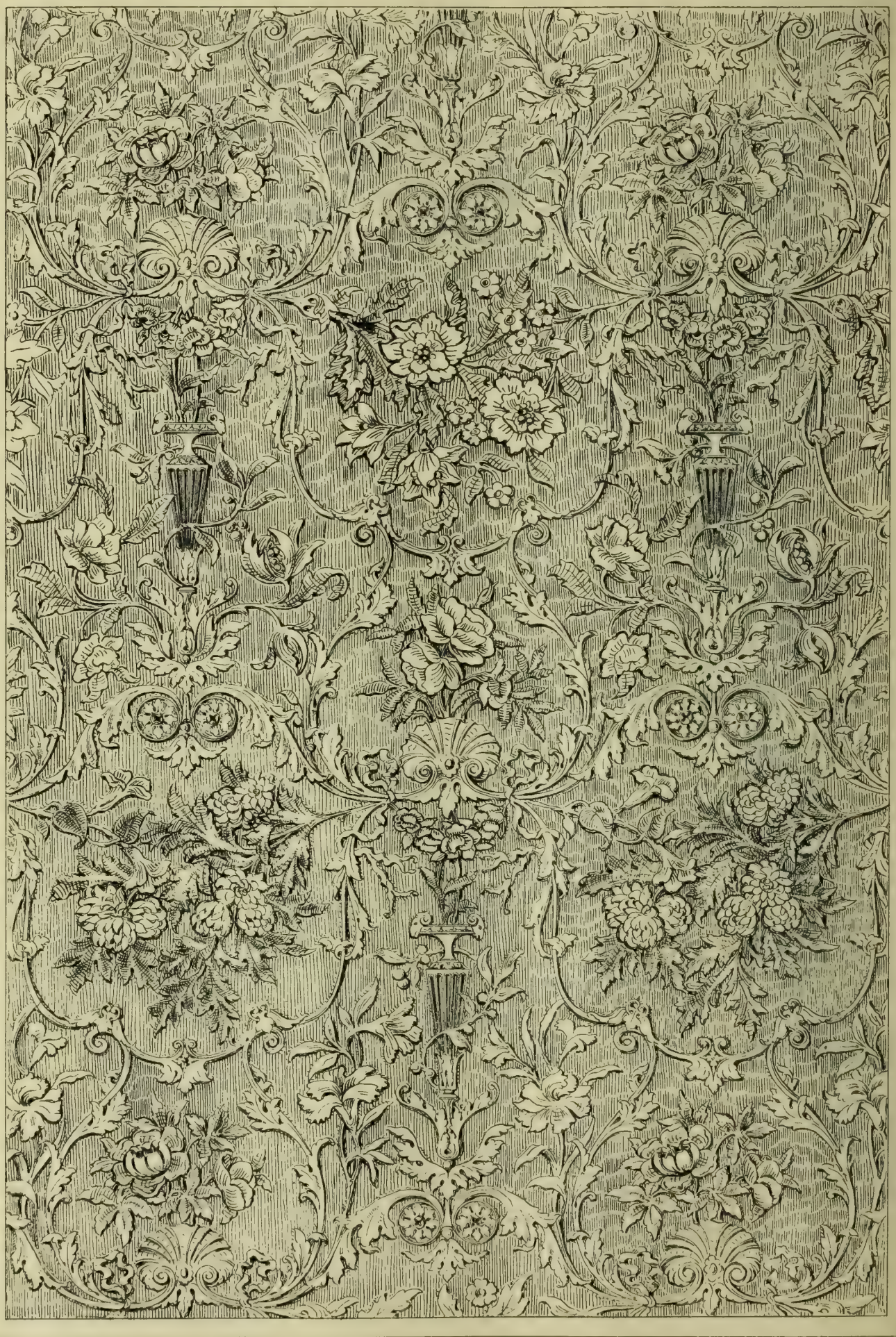


Photo Lithographed & Printed by James Akerman, 6, Queen Square, W C

TYNECASTLE · TAPESTRY · DESIGNED · BY · W · SCOTT · MORTON ·

STABLES to Malwood House for R. H. SAY esq^re^
BALHAM HILL S.W.

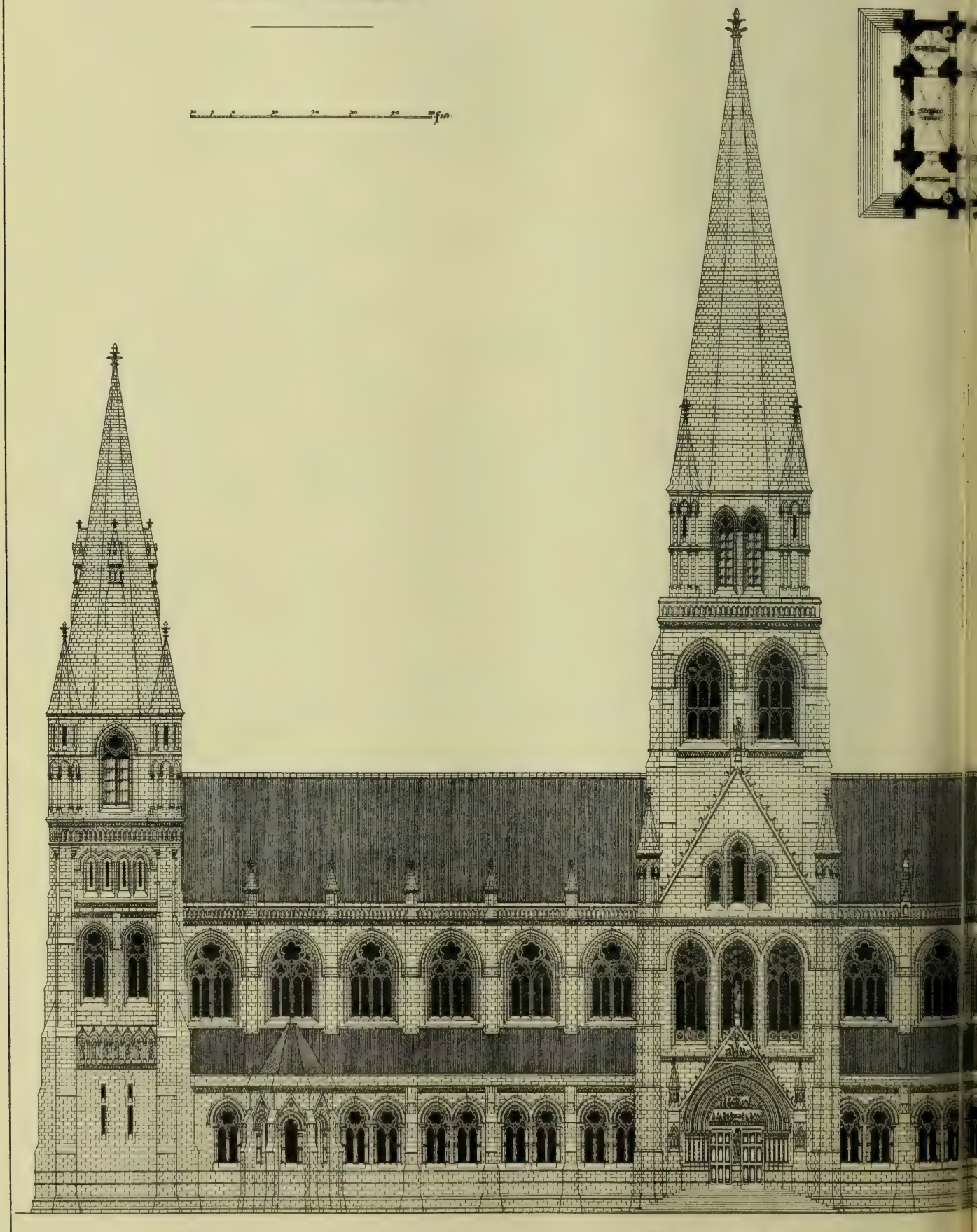
ARTHUR CAWSTON ARCHITECT

Photo Lithographed & Printed by James Akerman, 6, Queen Square, W.C

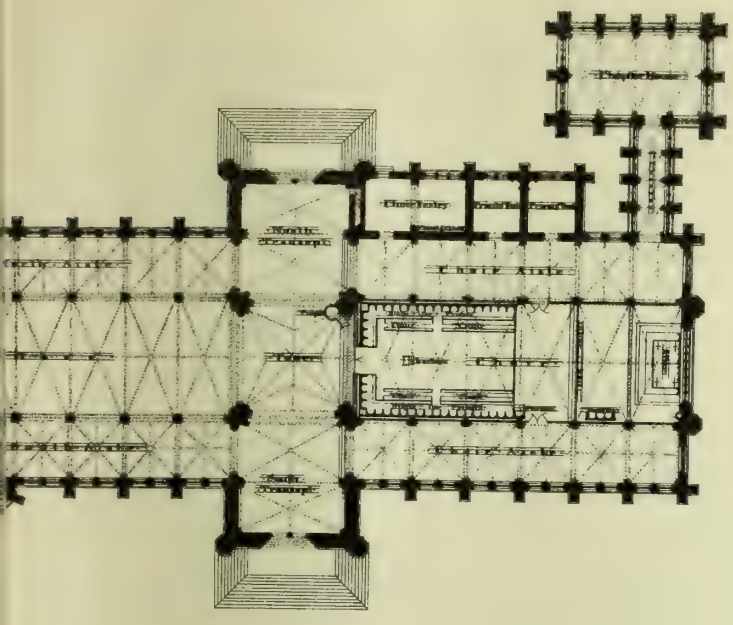
A Cathedral Church

by

Gilbert S. Doughty

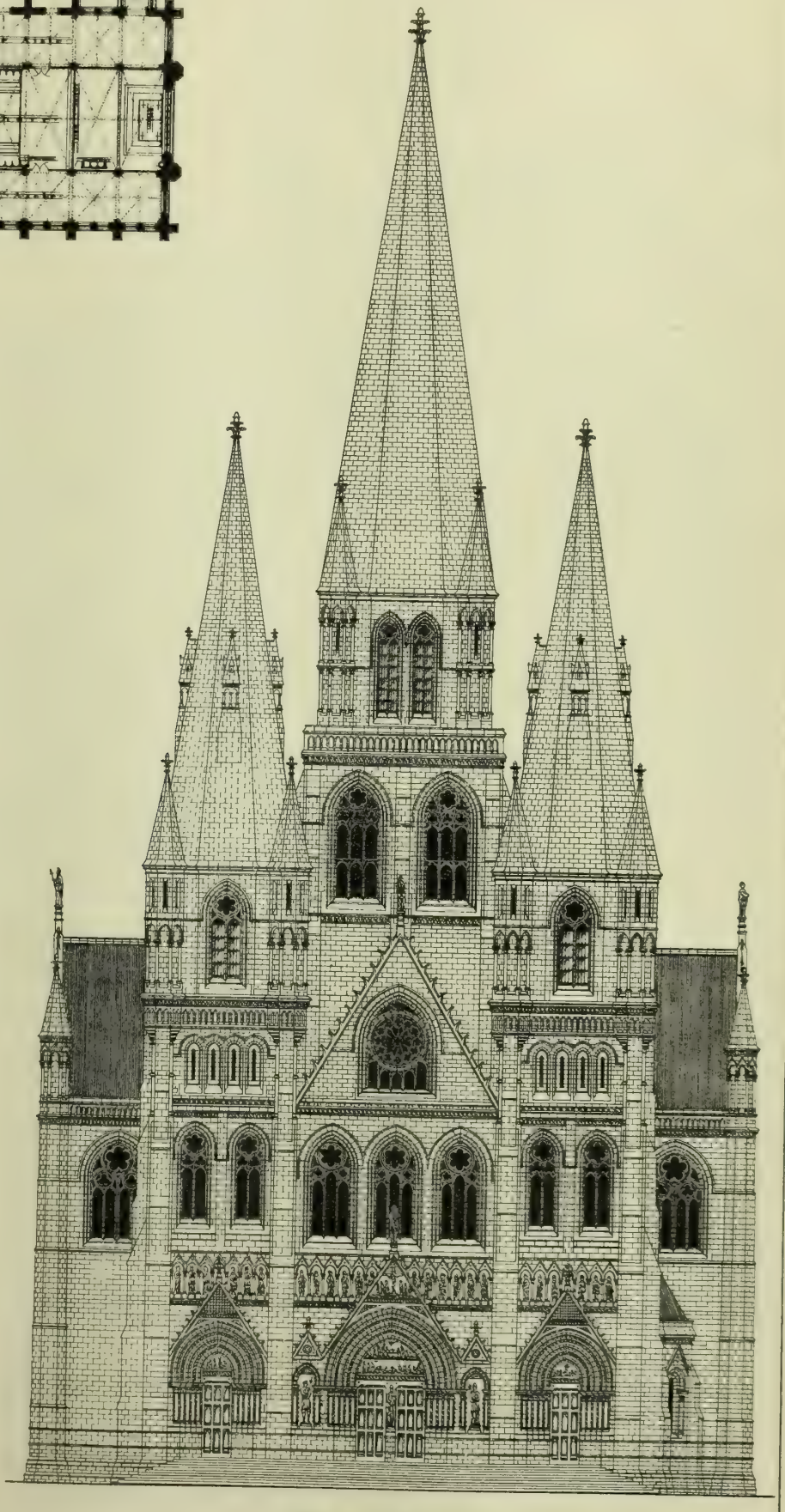


South Elevation



· Ground · Plan ·

TIONAL SILVER MEDAL AWARDED



· West · Elevation ·

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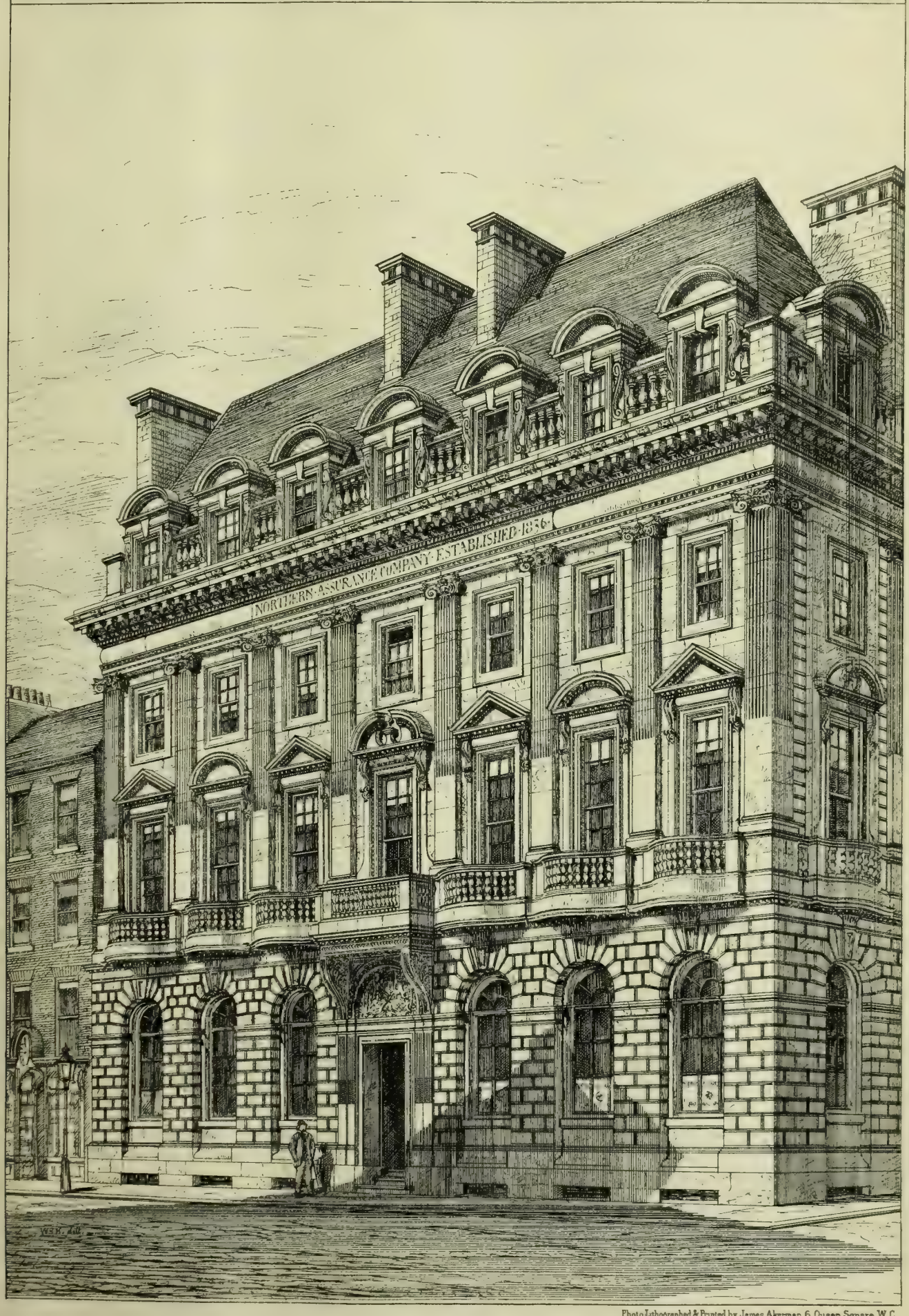
NEW OFFICES FOR THE NORTHERN ASSURANCE COMPANY · NEWCASTLE-UPON-TYNE · AUSTIN, JOHNSON & HICKS · ARCHITECTS · NEWCASTLE ·



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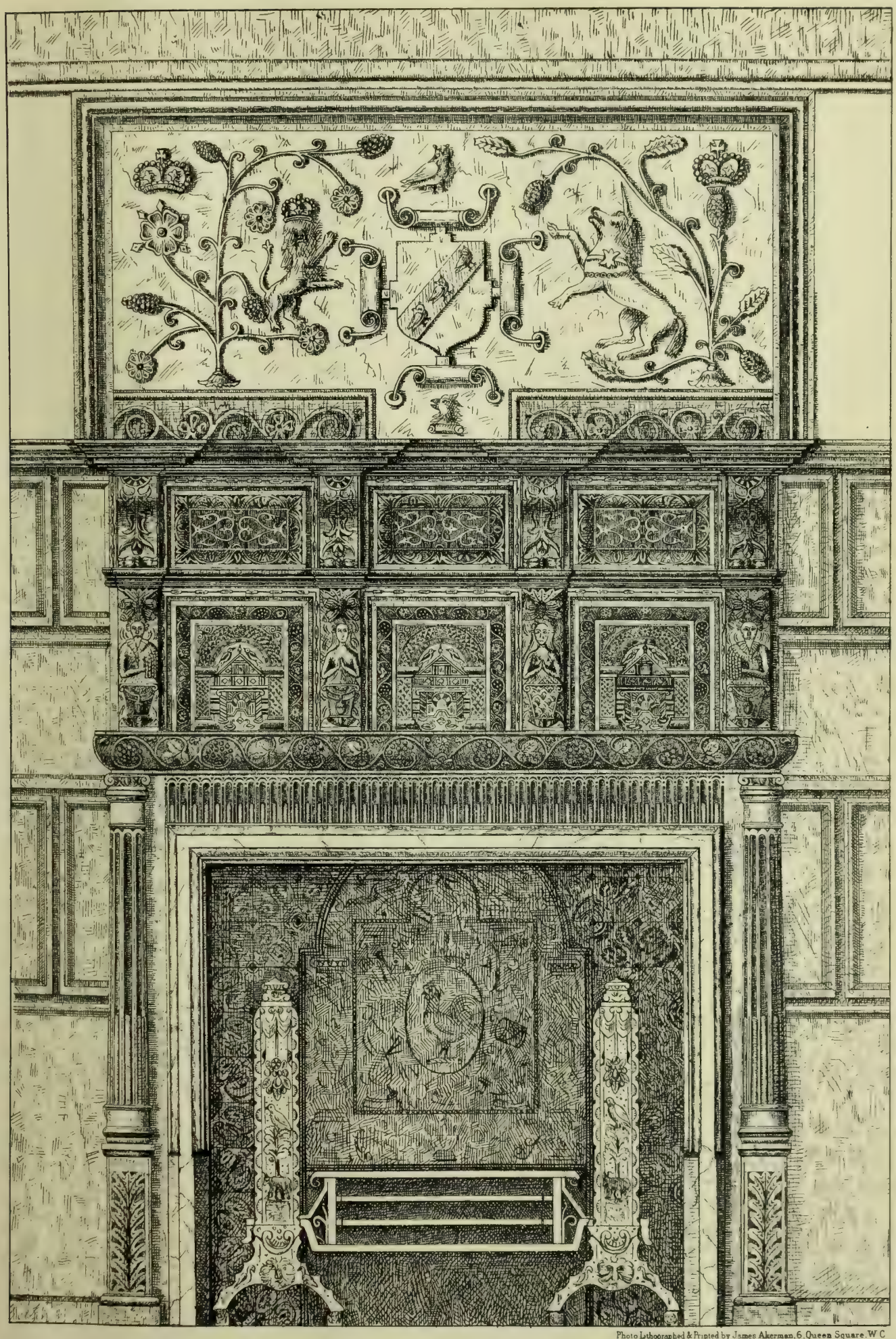

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OAK FIREPLACE OLD COCK HOTEL HALIFAX

Measured and drawn by Jos. F. Walsh. 1880
Student of the Art School of Art

MR. H. H. STATHAM ON ORNAMENT.
III.

In his third lecture on "Ornament," delivered at the Royal Institution, on Thursday, March 31st, Mr. Statham dealt with a wide field, passing, in an hour's address, from Celtic to Saracenic and Oriental ornamentation, and from thence to take a rapid survey of the whole of Gothic art. The lecture, like the previous one, was profusely illustrated; the examples shown including many large drawings by Mr. Statham, coloured diagrams and textile fabrics from the South Kensington Museum, and a number of casts of Gothic details, lent by Messrs. Brindley and Farmer, of Westminster-bridge-road. Mr. Statham said he introduced the subject of Oriental decoration by a reference to Celtic art, because the latter represented in an almost typical manner the principle of "ingenuity in arrangement" which ran through the whole of Eastern ornament. This Celtic ornamentation was chiefly exemplified in Irish manuscripts, and in the sculptured stones in the remoter districts of Wales, Cornwall, and West Scotland. It had an obvious connection with Byzantine art, and appeared a development of Eastern influences and civilisation imported into these islands, probably by missionaries, about the fifth and sixth centuries of this era. It consisted of simple elementary forms, so twisted, tangled, and interwoven, as to produce an effect of great complication. Spiral and broad riband forms were the more usual ornaments, and these were often very minute, and so elaborate as almost to baffle the copyist. Indeed, Mr. J. O. Westwood mentioned in his handbook that in one initial on an Irish MS. he counted 136 curves in a space ½in. by ⅝in., and that he had broken down in an attempt to copy a single page of the Book of Kells. These manuscripts were, in fact, the work of men who believed that in copying and illuminating the sacred books they were performing a sacred duty, and who did not grudge devoting a lifetime to the task. Animals were often introduced; these represented a peculiar type of what might be supposed to be a dog, grotesquely treated, whose head and tail formed the extremities of the riband or spiral form, the wreathings of which were always connected. These designs were freely treated with colour, and in all their varieties were typical, he considered, rather of an ingenious than of a high art. Saracenic ornament, to which he must next proceed, might be divided into two classes, the earlier being the Arabic, and the later the more elaborate and refined Moresque phase. Both were marked by a free employment of flowing and involved patterns, based on natural forms, but into which the representation of the human figure or of animals did not enter. The designers were prohibited by their religion from availing themselves of these obvious sources of ornamental motive, and so were compelled to bestow the more skill upon the limited field of artistic decoration, with results at once original and beautiful. In Arabic work colour was employed more consistently than in Celtic; in the latter art it was applied anywhere upon a band or stem, just where the artist thought a spot of red or green would appear effective. In the former art a given figure was maintained of one colour throughout, harmony and balance being attained by interlacing the forms with a regard both to colour and line. By the Moors, the flowing and interchanged forms were carried out with still greater intricacy and refinement, and the colours were most harmoniously combined so as to produce a rich effect. Moresque ornament was carried out with a delicacy, richness, and elaboration which often removed all recollection of the mechanical origin and building-up of the design. The hexagon, distorted and varied, with ingeniously stopped lines here and there, was the basis of many of the Moresque schemes of decoration, and in the better class of work the ornament was often conceived upon two or even three apparent planes of differing design, the interstices being fitted up with other patterns placed obliquely to the principal forms. These were treated with gilding, blue, red, and other bright colours, applied in such small quantities as not to offend. A large number of examples were shown, chiefly of decorations from the Alhambra. In Persian work of all periods there was a more free use of flowers, but the ideas were too realistically treated, and not with the intellectual skill shown by neighbouring nations. In examining Indian ornament they came upon a very different mode of treatment, and one in which natural forms were boldly treated in naturalistic fashion, both as to colour and outline. One reason for this was that our knowledge of Indian ornament was largely derived from textile patterns, in which the natural treatment of flowers and foliage was more suitable than it was to architectural design or to furniture. A peculiarity of Indian ornament was that the artist never sought to define or enclose his ornament with a band. The edge of the portion decorated was marked only by the stoppage of the patterns. Especially could this be noticed in damascened metalwork. The ornament was clearly much more guided by the feeling and taste of the designer than by any reasoning process. The alternation of two forms or colours, the variation of minor details, and the use of the singular detail we called the curled pine-cone, were other characteristics of Indian ornament; but its great and distinguishing beauty was the skilful use of colour. The brightest hues were so blended in small quantities as not to attract the eye to any one portion of a design, but to leave a general impression of bloom. It was interesting to trace the occasional appearance of details, evidently borrowed from Classic sources, but debased and altered, in Indian work, and this owed its origin to the conquests in North-West India by the Greeks. In conclusion, Mr. Statham rapidly traced, by a series of illustrations and casts, the rise and progress of Mediæval ornamentation, showing how in France and England the Classic and Byzantine gradually resolved themselves into the Norman, how they gradually developed into the free and elegant First Pointed, how this became debased as natural forms were more and yet more carefully imitated until, in our Perpendicular, the mouldings became extremely shallow, and the whole aim was to cover a large surface with an appliqué scheme of easily executed decoration without bestowing much thought upon its individual features. In his fourth and concluding lecture, delivered yesterday (Thursday) afternoon, Mr. Statham commenced with the return to Classic types at the Renaissance, and having referred to the work of the Adam Brothers in the last century, dealt with the present craze for Japanese ornament, showing its merits and misapplications.

CHIPS.

A meeting of the restoration committee for the Ashburton parish-church was held on Friday, when the report of the architect, Mr. G. E. Street, R.A., was read, showing that the amount required for the complete restoration will be £4,000. It was resolved that the architect be desired to proceed with the necessary plans.

At the last meeting of the local board for Bromley, Kent, a report was received from Mr. Alfred Williams, the engineer, as to the progress of the main sewerage. The total length of the Bromley sewers is 23¾ miles, and the contract has been taken by Mr. Potter, at £29,758, and will, the engineer expects, be finished for considerably less than the estimated sum. The Ravensbourne sewer will cost less than the contract-sum, and will be completed within 34 months.

A new police-station at the prison buildings adjoining the Maison-Dieu, Dover, was opened last week. The work has been carried out by Messrs. Denne, of Walmer, from the plans of the borough surveyor, under whose direction the old police-station in Queen-street has been altered into sergeant's residence and surveyor's offices.

The east window of the parish-church of Brownsover, near Rugby, has just been filled with stained-glass at the expense of Mr. Matthew Holbech, Bloxam, the well-known archæologist, and as a memorial to Mr. Laurence Sheriff. The principal subject is the Crucifixion, and in the side lights are figures of St. Gabriel and St. Michael. The work has been carried out by Mr. Frank Holt, of St. John's, Warwick.

The specification of Messrs. Henry Jones and Son, South Kensington, was accepted last week for the erection of a new organ in Brackley parish-church, Northants.

At a vestry meeting held at Rotherfield, Sussex, plans prepared by Messrs. Cronk, architects, of Tunbridge Wells, were approved for building a voluntary school at Jarvis-brook.

Mr. Sidney Cooper, R.A., has expressed an intention of formally presenting to the Corporation of Canterbury a school of art, which he has erected and furnished in St. Peter's-street in that city, and which is now being carried on in accordance with his views upon art-training and education.

A Hundred Thousand Replies and Letters on subjects of Universal Interest have appeared during the last ten years in the ENGLISH MECHANIC AND WORLD OF SCIENCE, most of them from the pens of the leading Scientific and Technical Authorities of the day. Thousands of original articles and scientific papers, and countless receipts and wrinkles embracing almost every subject on which it is possible to desire information have also appeared during the same period. The earliest and most accurate information respecting all new scientific discoveries and mechanical inventions is to be found in its pages, and its large circulation renders it the best medium for all advertisers who wish their announcements to be brought under the notice of manufacturers, mechanics, scientific workers, and amateurs. Price Twopence, of all booksellers and newsvendors. Post free 2½d. Office: 31, Tavistock street, Covent-garden W.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

ADVERTISEMENT CHARGES.

The charge for advertisements is 6d. per line of eight words (the first line counting as two). No advertisement inserted for less than half-a-crown. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front Page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No front page or paragraph Advertisement inserted for less than 5s.

Situations.

The charge for advertisements for "Situations Wanted" is One Shilling for Twenty Words, and Sixpence for every eight words after. *All Situation advertisements must be prepaid.*

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday. Front page advertisements and alterations in serial advertisements must reach the office by Tuesday to secure insertion.

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(Payable in Advance.)

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We regret that great pressure on our space this week compels us to leave over the continuation of Professor Street's Academy lectures, several letters, and other matter.

"BUILDING NEWS" DESIGNING CLUB.

SUBJECT.

A gamekeeper's cottage, containing gun-room and w.c. attached, a living-room, kitchen, and offices, and three bedrooms. Plans, and two elevations, or one elevation and a view. Scale, 8ft. to the inch.

Drawings Received.—Trial, Cambria, Con, T. A. H., Merit, Bonus Hominus, Cain and Abel, Eclipse, Nemo, Fred, Virginius, Squib, That's my Idea, Nil Desperandum No. 2, Ambition, Beta.

Correspondence.

THE PRESIDENCY OF THE INSTITUTE.

To the Editor of the Building News.

Sir,—It is with very great regret that, not only I, but many others, have heard that Mr. Street is prepared to serve as president of the Institute, if elected, instead of the gentleman nominated by the Council.

No one feels more admiration than I do for the artistic talents and the rare personal abilities of Mr. Street, and it would give me unfeigned pleasure to join in a unanimous vote of the Fellows in his favour. But surely it is placing him in a position in every way unworthy of him to make his presidency depend upon the result of a struggle in which no point of principle—not even, so far as I know, the old cry of Gothic and Classic—is raised.

With regard to Mr. Horace Jones, there are many considerations, such as his large practice and extended experience, his personal ability, his official position, and, above all, his steady devotedness to the affairs of the Institute, which make him a very suitable man to hold the office of president. In addition to all this there is one point of very practical import. For very many years Mr. Horace Jones has been a consistent advocate of examination for the profession of an architect. The scheme which has been adopted, and is to come into operation in 1882, is largely

due to his initiative. He took an active part in putting it into shape, and should he be in office during the year of its introduction, such support as it may require from the president of the Institute will be ungrudgingly accorded. If, on the other hand, Mr. Street, who has never given any support to the proposal, and is understood to be unfavourable to it, be president, I do not say he will intentionally hamper or hinder it, but he cannot be expected to take any cordial part in its establishment, and the difference between a friendly or an unfriendly president will be sufficient to have a most sensible effect on the future of the examinations. I submit that the Institute will be stultifying its past actions if, at such a moment as this, it goes out of its way to deal an undeserved blow in the face to the man whose proposal it is adopting by substituting for him another who has taken no part in advocating or assisting the examinations.—I am, &c.,

T. Roger Smith.

Sir,—I cannot think that many members of the Institute will agree with Mr. Burges' views as expressed in his letter in your last issue. I, for one, think that the most suitable man *should* be elected, and that the election should not be influenced by any mere question of routine or Council seniority.

It is, I admit, extremely unfortunate that those who do not agree with the present absurd by-law, which practically leaves the Council no choice as to nomination, are obliged, so to speak, to go into opposition; but Mr. Burges utterly mistakes this opposition if he supposes that is "a set" at Mr. Horace Jones, who, by the accident of circumstances, has suddenly been placed in the position of immediate senior Vice-President—a position which Mr. Street would this year have himself held, had he not, by retiring, shown his evident disinclination to be thrust upon the Institute under the new by-law; and I submit, with all possible respect to Mr. Horace Jones, that Mr. Street's claims should not now be passed over because he has declined to accept a mere routine nomination in order of Council seniority. Mr. Horace Jones will not think those wanting in respect to him or for his high professional reputation who, considering Mr. Street's claims are pre-eminent, have issued the accompanying circular to the Fellows of the R.I.B.A.

I hope, with Mr. Burges, that, after the election, immediate action will be taken to call a special meeting to consider the desirability of repealing the new by-laws as to Presidential and Council nomination.—I am, &c.,

Robert W. Edis, F.S.A.

14, Fitzroy-square, W., April 6.

14, Fitzroy-square, March 31st, 1881.

Dear Sir,—An influential body of the Fellows of the Royal Institute of British Architects intend to support Mr. George Edmund Street, R.A., who has been nominated for the office of President, and has undertaken to serve, if elected. Should you feel, with them, that Mr. Street's claim cannot be passed over, in justice to himself and the profession we trust that you will make every effort to be present on the 9th May, to support him by your vote.

Robert W. Edis, F.S.A. / E. Phene Spiers } Hon. Secretaries of the Committee for the promotion of Mr. Street's election.

An intimation of your co-operation in this proposal is requested.

Sir,—Is it to be regretted that opposition to the suggested gentleman has arisen.

It is said that Mr. H. Jones is not the "head of the profession," and that Mr. G. E. Street is. The latter part of this statement is not so universally acknowledged as the opposition would have us to believe; and it is to be hoped, for the credit of the profession, that the latter gentleman will decline any nomination made in so invidious a manner.

If, at every election, the cry is to be raised "elect the head of the profession" there will be jealousies in what should be a united body. Besides, the question "*Who* is the 'head of the profession?'" would soon land us in a mess worse than the old battle of the Styles.

The duty of a president is *to preside*; and in this there can be no question between the courtesy and tact of the city gentleman, and the strong force of character shown by the great Mediæval-restorer.

The sensible and practical letter of Mr. W. Burgess, in your last, is the best solution; and it is to be hoped that it will weigh with the moderate men who constitute the great body of the profession.

April 4. H. H. S.

BARING'S BANK, BISHOPSGATE-STREET.

Sir,—What *is* architecture? I know what it *was*, but am afraid that the term is now capable of another definition. It used to be considered that reason, symmetry, unity, proportion, and beauty—apart from convenience and solidity—were some of the essential principles of architecture, and were absolute and constant properties of the art, but one or two of the so-called leading men of the day seem to ignore all this, and, because they have plenty of ignorant patrons, would endeavour to make the public believe that the ugly buildings erected under their guidance constitute an improved architecture appealing to cultivated tastes.

The latest specimen of such refined design is to be seen at No. 8, Bishopsgate-street Within, is for the use of the bankers, Messrs. Baring, and has, in connection with its production, the name of Mr. R. Norman Shaw, R.A.

The building is three square stories in height above the ground, has three dormer windows at the top, seven windows on each of the second and first stories, and five on the ground-floor, the principal and side-entrances completing the front. The materials employed are red brick and stone, the covering of the roofs red tiles.

I do not propose to accuse Mr. Shaw of originality in design, only that he has borrowed some of the features of a bygone style, and has so distorted and misapplied them, that the effect produced is one of unmitigated ugliness.

The building is stopped on either side by the usual party walls with their chimneys carried up and probably the cheapest and best manner of terminating such a roof would be to butt it on either side next those walls; but no, that would be commonplace, so Mr. Shaw has cut spandrel pieces out at each end, thus forming convenient holes for snow, dirt, and rain, and had the width of the street been taken into consideration, and for a moment the isolated country mansion forgotten, it would have been at once discovered that any picturesqueness which might otherwise have been obtained from that treatment, must in this position be lost. Three dormer windows complete the roof, and I need scarcely say that they are not all central with the windows under.

The second story windows are all alike—"we are seven," but the two end windows are of the "lean kind," lanky, and of course we must not have the usual skewback which gives the character of strength to the arch, where it is required, so the arch here is terminated by vertical lines in continuation of the reveals. Above this range of insipidity is the principal cornice, ornamented with dentils, egg and tongue, and modillions, good in itself, but quite incongruous in such a building where affected plainness is the leading idea.

We are now at the seven elegantly-proportioned windows of the second story—no variety except the end, narrower lights—one unbroken series of badly-proportioned holes in the wall. These windows have segmental heads with brick arches, with proper skewbacks and keystones; above the arches, concentric and terminating with them are drip stones, so well conceived, that as soon as the soot and dirt thereon accumulate, and the rain washes it off, it will run down in black streaks till it reaches the lower string-course, over which it will pass, accumulating dirt as it goes along, and so on to the face of the wall still further under, till it meets the next range of windows. We thus obtain all the effect of architrave mouldings without any of the cost.

This brings us to the ground floor, which only requires to be seen to be appreciated. I do not profess to know how the interior is planned, but I take it that the poor little doorway at the extremity leads to a passage which communicates somehow or other with the bank office, that the large opening next it leads to some stables, that there is a wall along dividing them from the office, and that the truly wonderful windows on the right contribute to light that office; at any rate, if they do not, it is not because of want of height, for of all the distortions in the way of windows that it has ever been my lot to see, these ground-floor windows bear the palm. But the principal entrance—the principal entrance, Sir, oh! it is—it is quite too consummately utter.

Of course, the windows have wide frames, taking away as much daylight as possible, and equally, of course, the panes are in small squares. These honest architects would not dream of adopting the inventions of science which enable ordinary mortals to glaze their sashes in two squares with that glass which contributes greatly to the sarisfactory effect of any building.

The brick quoins of the windows are rubbed and gauged; the filling in not so, necessitating different width of joints, and as, probably, the architect was not cramped for expenditure, it is to be regretted that the whole face-work was not rubbed and gauged.

Now, Sir, no man in the profession grudges Mr. Shaw the well-earned, extensive business he carries on, but I do wish to ask how far the sort of stuff he and others are foisting on the public is likely to extend, as there can be no doubt that it is gradually but surely bringing the profession into ridicule. Is it because there exists a set of inconsistent visionaries (of which Mr. S. S. Stevenson is one) who, by dint of iterated and reiterated eccentricity and absurdity have cajoled the Peacock and Lily fools into believing that what they see is a superior kind of architecture, that, therefore, it is artistic, therefore it is beautiful, therefore it is to be the architecture of the day? Can they not listen to the voice of reason, and know that all this new style of architecture is simply prigged from a bygone style, and doctored up with the necessary quantity of unadulterated ugliness to make it appear original? Have they considered the elements of taste, and with them thought of the buildings which have stood the test of time, and compared those with these? I will ask them only to go a few steps eastward of this last City atrocity, and see what John Gibson has done for the National Provincial Bank of England; look at it, grasp its worth, and then go back to No. 8, Bishopsgate-street, and think; then go a few doors further eastwards, still on the same same side of the street as the National Provincial Bank, see that splendid specimen of street Gothic architecture, Crosby House, then go back to No. 8 and think. Here are three specimens of architecture in quite distinct styles, within a stone's throw of each other, and I only invite students and patrons of architecture to carefully consider these three buildings, and if they do not come away with clear notions as to what is art and what is not, I shall be very much surprised. I would enjoin all students not to be led away from the true principles of architecture and art by any passing and spasmodic deceit by whomsoever practised. Such false notions did not produce a Wren, a Soane, a Barry, a Smirke, or a Pennethorne, whose works endure the test of time. Raphael's your friend, not Whistler.—I am, &c.,

Wm. Woodward.

CARDIFF INFIRMARY.

Sir,—In consequence of the paragraph which has recently appeared in your paper relative to the designs for this infirmary, I deem it desirable to send for insertion the report which I made upon them as referee in 1875. A committee of medical men reported in accordance with my report, and the Competition Committee adopted the plan I had placed first, but divided the premium between the authors of the first and second plans.—I am, &c.,

April, 1881. Edwin Nash.

To the Treasurer and Committee of the Glamorganshire and Monmouthshire Infirmary, Cardiff.

Gentlemen,—I have the honour of presenting to you the following report upon the plans submitted for your proposed new buildings.

There are seventeen sets of designs represented by a very large number of drawings upon 113 mountings or rolls, and many of these show very great skill, and a strong endeavour to plan this hospital in a correct and complete manner.

I have visited the intended site, which in many respects seems to be very suitable, but I am not called upon to speak of this, nor am I able to remark upon the external drainage, and as to the water I am told that it is to be supplied by the Cardiff Water Company.

The curative properties of pure air and sunlight should be kept in mind while selecting plans for an infirmary, and with this view I have sought to give preference to such designs as have their principal sick wards running parallel with north and south, whereby more sunshine is secured than by any other aspect; nevertheless, if any plan has high merit irrespective of the aspect of the wards, and if it can be turned round upon the land to give the proper aspect it should not be rejected in an offhand manner, provided that other arrangements be of a suitable kind, such as a good general massing of the blocks of buildings and a convenient arrangement of the details, all coupled with economy, and there should be a sufficiently good external appearance.

It was not possible to form a just conclusion upon the relative merits of so many designs without a laborious analysis, and this involved a tabulation of all of them, under numerous headings, occupying two full days before I could reject half of the plans as not being suit-

able, after which the difficulties of comparison increased in respect of the remainder.

Amongst the seventeen sets only nine of them place their principal sick wards running north and south, and seven of these nine are very excellent plans, as are also two others, with their wards west and east, though each of all these has some defect either small or large, which fact indicates the extreme difficulty that even the most ingenious men have in perfect planning. One thing strikes me as very peculiar, namely, that for a hospital within a large town, so few of the plans show convenient arrangements for accident cases, which require ready approach and immediate treatment. The out-patients departments are much better managed.

Provided that the wards run north and south it seems to be immaterial as to whether the main frontage of the establishment be to the north or to the west except that there is always a dulness of look in a Northern aspect.

From these design drawings it is not possible to judge of the constructive stability, it being requisite to have working drawings for that purpose which these are not, and many of them have no detailed sections wherein the construction would especially show itself, but every one of the designs which I have selected for special remark could be substantially built.

There are also many details which it is needless for me to remark upon, the chief point now being the determination upon a good arrangement of plan.

The estimates of the several designs range from £8,350 to £29,675, and my belief is that about £21,000 will be requisite for such a hospital as you require for 100 patients.

I have believed that a critical description of those designs which are conspicuous for some excellence will be acceptable, and therefore, as part of my report, I submit my remarks upon them, and I estimate their merits in the following order :—

	Wards run
A "Health"	North and South
B "Tria juncta in Uno"	,, ,,
C "X. Y. Z."	,, ,,
D "Mente et Manu"	,, ,,
E "Nota Bene"	,, ,,
F "Veritas"	,, ,,
G "Mon devoir"	,, ,,
H "Nemo"	West and East
I "Bristol"	,, ,,

It will be observed from all these descriptions that not one design can be taken as satisfactorily complete and fit for erection just as it is drawn. This always happens with competitive designs, and the only result can be that a design must be selected which embraces as nearly as possible that which is required, after which the architect whose plan is so taken must be desired to modify his work to suit the particular circumstances of the case.

The external æsthetics are best in "Tria juncta in Uno," "Health," "X. Y. Z.," and "Bristol."

I trust that the injustice of paying an architect a premium and the employing some other architect to carry out the work will not be committed.

In conclusion, I thank you for your confidence, and have the honour to be, gentlemen, your obedient servant,

Edwin Nash.

5, Adelaide-place, London-bridge, Sept. 6th, 1875.

(Here followed the critical remarks upon each of the designs alluded to above.)

CARLYLE AND THE ARCHITECTS.

Sir,—Every one must be thankful to Mr. Froude for publishing Carlyle's portraits of his distinguished contemporaries drawn with such refreshing candour, and though the series contains the portraits of the dead only, we may hope soon to have the series of the living. I subjoin an extract showing his views of the building trade which may interest your readers.—Yours, &c.,

G. Aitchison.

150, Harley-street, Cavendish-square, W, April 2, 1881.

"Shortly after my return from Germany, there began a new, still worse, hurly-burly of the building kind, that of the new top story—whole area of the house to be thrown into one sublime garret-room, lighted from above, 30ft. by 30, say, and, at least, 11ft. high, double-doored, double-windowed, impervious to sound, to—in short, to everything but self and work. Something really good might have come of it in a scene where good and faithful work was to be had on the part of all, from architect downwards, but here, from all* the 'work' of planning to begin with, and then of executing in all its details, was mere work of Belial—*i.e.*, of the father of lies, such 'work' as I have not conceived the possibility of among the sons of Adam till then. . . . By degrees I perceived it to be the ordinary English 'work' of this epoch, and with manifold reflections, deep as Tophet, on the outlooks this offered for us all, endeavoured to be silent as to my own little failure. My new illustrious 'study' was definable as the least inhabitable and most entirely detestable and despicable bit of human workmanship in that kind, sad and odious to me, very. But by many and long-continued efforts, with endless botherations, which lasted for two or three years after (one winter starved by 'Arnott's improved grate,' I recollect), I did get it patched together into something of supportability, and continued, though under protest, to inhabit it during all working hours, as I had, indeed, from the first done. The whole of the now printed 'Friedrich' was written there (or, in summer, in the back court and garden, when driven down by baking heat). Much rawer matter, I think, was tentatively on paper before this sublime new 'study.' 'Friedrich' once done, I quitted the place for ever, and it is now a bedroom for the servants.

"The 'architect' for this beautiful piece of masonry and carpentry was one 'Parsons,' really a clever creature I could see, but swimming as for dear life in a mere 'mother of dead dogs' (ultimately did become bankrupt). His men of all types, Irish hodmen upwards, for real mendacity of hand, for drunkenness, greediness, mutinous nomadism, and anarchic malfeasance throughout, excelled all experience or conception. Shut the lid on their 'unexampled prosperity' and them for evermore."—"*Reminiscences*," *by Thomas Carlyle.*

* Except one good young man of the carpenter trade, whom I at length noticed thankfully in small matters.

CHIPPING NORTON CEMETERY COMPETITION.

Sir,—I see, from your last week's issue, there were four sets of designs selected by the Town Council, one of which was by Messrs. Webb and Tubbs. It would be only satisfactory to the remainder of the competitors if Mr. G. H. Sanders, the secretary, would publish the names of the other three selected designs.

Another of the Forty-Seven.

ST. PETER'S AND ST. PAUL'S.

Sir,—I only lately read, in the Building News of Feb. 25th, the report of a paper by Mr. Somers Clarke, junr., on "St. Peter's and St. Paul's Cathedrals," in which it is stated that "the idea of St. Peter's was essentially that of the Basilica of Marentius and the Parthenon dome" (of course the Pantheon); but although it is mentioned that Wren aimed at a "good Roman manner," and the many coincidences of the plans of New St. Paul's and Ely are observed, yet two coincidences in the design and construction of St. Paul's that have always struck me very forcibly are overlooked.

The facade of St. Agnes's church in the Piazza Navona at Rome is so very suggestive of the west front of St. Paul's that I think Wren must have been influenced by it, and the cone of the baptistery at Pisa clearly suggests the essential feature of the construction of the dome of St. Paul's.—I am, &c.,

M. M.

CHIPS.

Two stained-glass windows, which are about to be placed in the Free Church at Lochlee, Forfarshire, to the memory respectively of the late Lord Dalhousie and Dr. Guthrie, have just been completed by Messrs. Ballantyne and Son, Edinburgh. The surfaces of the windows are diapered with a design representing a burning bush and Scottish thistle alternately; in the centre panel of the one are the arms of supporters of the Panmure and Dalhousie families, while the other exhibits a spray of the wild rose, having intertwined a scroll bearing the words, "I know that my Redeemer liveth."

The Kenilworth local board of health have accepted the tender of Mr. Fell, of Leamington, for the execution of drainage operations; and the works are to be proceeded with at once. Mr. Fell has just completed similar works at Leamington, where his tender for one section of the town was accepted at £1,140.

The vestry of St. Pancras, on Monday, authorised their sanitary committee to take immediate steps to provide accommodation for smallpox patients, at a cost not to exceed £1,500. It is proposed, in the first instance, to erect an administrative block and wards for 20 patients, and the site will probable be adjoining the workhouse and St. Pancras-gardens.

At the Salop quarter-sessions, on Monday, a resolution was carried authorising the reconstruction of the Shire Hall, at Shrewsbury, which was destroyed by fire in November last. The cost is estimated at £35,000, and the work will be commenced at once.

At the City Guildhall police-court, on Monday, cross-summonses for assault were heard, in which Mr. Edward Sadgrove, an architect's assistant, of Holborn Viaduct, and James Stevens, night-watchman, in the employ of Messrs. Cubitt, contractors, Gray's Inn-road, were in turn complainants and defendants. The summons against Mr. Sadgrove was dismissed, but Stevens was fined 20s. and costs.

New Sunday-schools and a parish-room are about to be built for the parish of St. Michael's, Lewes, from the plans of Mr. Philip Currey, architect, of that town. The material will be random flint, with red brick dressings, and the buildings will be in keeping with the new vestry-room adjoining.

The Guildhall at Canterbury has just been renovated and improved internally, the chief hall being fitted up with new oak panelling, two galleries, and cross benches in the area. The work has been carried out by Mr. J. F. Cozens, of Canterbury, from the plans and under the supervision of Mr. J. E. Hall, the city surveyor.

An inquiry was held at Chesterfield on Wednesday week before Mr. R. Morgan, C.E., one of the inspectors of the Local Government Board, relative to an application by the rural sanitary authority for powers to borrow £10,000 for works of water supply in the parishes of Tapton, North Wingfield, Stretton, Morton, Pilsley, Shirland, Higham, and Wessington. Mr. E. Frith, of Bakewell, is the engineer.

Intercommunication.

QUESTIONS.

[6470.]—**Floors.**—Will some reader kindly explain the meaning of the word "listed," in reference to the laying of a floor, and oblige ?—A.

[6471.]—**Material for Mounting Tracings on Linen.**—Can any of your readers kindly inform me what is the best material for mounting tracing on linen? I at present use paste, but find if I put it on at all thickly the result is a yellow, blotchy appearance, not pleasant to the eye; whereas, in trying to avoid this by thinning the quantity, the tracing does not adhere. I think there must be some better substance than paste.—E. W. C.

[6472.]—**Plain Tile-Roofing.**—I should feel obliged if any of your readers would kindly inform me from actual experience as to facts (for I find opinions are many and varied), (1) What is the lowest pitch at which it would be safe to use plain tiling, laid dry, as covering for roof, the tiling being laid in courses to show 4in. on face? (2) Ditto. ditto. to show 3in.? (3) Is "bedding in mortar" practically of much use? Is it a fact that that operation frequently causes rather than prevents dampness? (4) What is the object of bedding on hay? Does not the hay very speedily decay? (5) Is "torching" (pointing tiles on inside) effectual in preventing penetration of wet? (6) Are any of these additional processes really necessary to obtain an effectually weather-tight covering, or can a tile-roof be really weather-tight without them, the tiles being simply laid dry on the battens? (7) Should tiling, to be properly executed, be nailed to the battening, or merely hung thereto, as seems to be the usual practice? —W.

REPLIES.

[6423.]—**Chapel.**—I should certainly advise "Alpha" to place his chapel approximately east and west, as it is an advantage to have it so in the case of Church of England services, especially if the Eucharist is to be celebrated to the mourners, as is occasionally done. I know of no sect who object to the orientation on doctrinal principles. —Quid.

[6428.]—**Oak Fittings.**—"B.'s" inquiries respecting oak suitable for fittings, &c., have met with one reply in particular that hardly seems to me to represent the true state of things. "B." having once been disappointed in some English oak, which, no doubt, was some very quick-grown hedgerow wood that, as a rule, shows very little branch, and is altogether unfit for the purpose, he thinks, perhaps, English oak is all alike, and foreign should be substituted. "H. H." seems to give some curious advice respecting English oak; for instance, to buy English dry oak planks at 2s. 2d. per foot cube seems to me most ridiculous. I have attended many timber sales, but I never found oak suitable for this work sell for less than from 3s. to 5s. per foot cube in the tree. I will leave anyone to judge what the butts when planked and kept till dry must be worth. 2s. 2d. is hardly the price of fir cut in scantlings, so that I think "H. H." must have made a mistake here. "B." might find some wood to suit his purpose in Staffordshire, where sometimes as good a sample is offered for sale as, perhaps, in any county. Coppice oak, 20ft. to 30ft. on butt, and 18in. to 30in. quarter girth, well grown, when converted properly, shows a grain and colour that, in my experience, is very seldom excelled. I have seen a quantity of oak within a short time used in a church where nearly the whole was cut out of small wood, consequently bastard, and as plain as possible. English oak, when required for internal fittings, should be obtained from timber maturely grown, of not less than 18in. quarter girth, and should be cut by some one who thoroughly understands how to obtain the branch, and then I fully believe it is second to none. If "B." is not suited I could give him the address of a firm where he could meet his requirements, but would have to give a good price.—H. R. B.

[6448.]—**Drain-Traps.**—These traps as mentioned are frequently used in the country, and without any troublesome results. Of course, they require to be carefully and well made.—H. Curtis Card.

[6449.]—**Discharge of Pipe.**—The 4in. pipe will discharge 225 gallons, and the 3in. 506 gallons per hour. For formula, see my reply to "Constant Reader," No. 6454.—W. U. O.

[6451.]—**Local Board Surveyors.**—The remarks of "S. W." to "W." are very true. I will mention three very recent appointments of surveyor, &c. 1st. Surveyor and inspector of nuisances, £150 per annum, surveyor to pay his own expenses in travelling. 127 applicants. A few were educated and had professional training, but the greater number were grocers, bakers, schoolmasters, soldiers, &c. The whole of the competent men in this case stood shunted for (probably) a respectable foreman of carpenters. 2nd. Surveyor and inspector of nuisances, £150 per annum, to a rural sanitary authority. 72 applications. A few were clever and competent men. One had written a book, "Guide to Sanitary Inspectors," and others had office and outdoor work under experienced surveyors, but the many were of tradesmen of every trade under the sun. In this case an ex turnpike keeper "walked in." 3rd. Surveyor of highways and inspector of nuisances, £120 per annum. 61 applications. A decayed farmer was elected. It may be through stupid crotchets of the members of Boards; it may be that men of culture, and men whose professional education has cost a small fortune, are not wanted nowadays. At any rate, the three cases I state may be a caution to a parent wishing to give his son an expensive and genteel means of obtaining a living. Pray, pause, I say to him. I will just mention another very recent appointment, £250 per annum. Seven were picked from 121 applicants. They were requested to attend a meeting for election, and to pay their own travelling expenses. One of the seven travelled from Newcastle, 300 miles out and 300 miles home. Well, the testimonials were pushed into the hands of the six unsuccessful by some lad, and not a word, not a "Thank you," from the Board. The only courtesy shown was from an official servant offering a glass of ale to wash down the insult. As a rule, out of 100 applicants not

more than a dozen are qualified men, It is the presumption of many who aspire to an office which they cannot properly fill that gives to members of Boards an independent incivility, and depreciates the qualified services of educated practical men.—Surveyor.

[6454.]—**Diameter of Pipe.**—According to Hawksley's formula, as follows (see Molesworth's Pocket-Book), the diameter of pipe will be 2·143in.

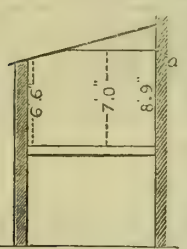
G = No. of gallons delivered per hour.
L = Length of pipe in yards.
H = Head of water in feet.
D = Diameter of pipe in inches.

$$D = \frac{1}{15}\sqrt[5]{\frac{G^2 L}{H}} \qquad G = \sqrt{\frac{(15\,D)^5\,H}{L}}$$

—W. U. O.

[6465.]—**By-Law of the Enfield Local Board Relating to Rooms in the Roofs of Houses.**—I should consider "W. K.'s" definition of "a room in a roof" to be correct, and a room such as that described could not be classed as a room in the roof. If the magistrates' decision is to be taken as correct, what is there to prevent "jerry" builders in Enfield putting up whole streets with the bedrooms throughout constructed in the same way, simply by calling them "rooms in the roof"?—Architect.

[6465.]—**By-Law of the Enfield Local Board, &c.**—Any room which is depending upon the roof for its ceiling, or part of its ceiling, must be termed "in the roof." The room of which your sketch is a section would not come under the power of the by-law for the reason that if you had shown a ceiling line (see *a* in sketch) at the height of 7ft. from the floor you would have found that such ceiling would be far more than one-half the area of the floor, as required by the Act.—Duncombe.



[6456.]—**Damp.**—This may be perfectly cured by hacking off the plaster as high as required, then nail on slates bedded in cement, breaking the joint, and afterwards plaster in cement, and, when dry, no damp will ever come through.—H. Curtis Card.

[6458.]—**Extras.**—I would advise "Subscriber" to consult his solicitor. There must evidently be some very cogent reason why his balance has remained unpaid for twelve months, and why the owner refuses him to inspect the premises.—H. Curtis Card.

PARLIAMENTARY NOTES.

The New Mint.—In the House of Commons on Tuesday, there was a short discussion on the Bill for acquiring a site for the New Mint on the Thames Embankment. Its rejection was moved by Mr. Firth, who was supported by Mr. Brand and Mr. Rylands. On the other hand, Sir T. Chambers spoke in favour of the Bill; Sir S. Northcote thought it ought to be referred to a Select Committee; and Lord F. Cavendish explained that, though the Government were carrying out the bargain effected by their predecessors, it was subject to the approval of Parliament. He further stated that the removal of the Mint was thought necessary for the improvements required, and this was an unusually favourable time for removal, as the Bank of England now held an unusually large amount of gold coinage—17½ millions. The opposition having been withdrawn, the Bill was read a second time, and ordered to be referred to a Select Committee.

Proposed Railway Extensions near London.—On Tuesday a select committee of the House of Commons, presided over by Sir John Kennaway, gave their decision with respect to a group of five Bills for extending the railway system near London. The Bill promoted by a private company for constructing a railway from the Uxbridge branch of the Great Western Railway to join the Watford and Rickmansworth Railway at Rickmansworth was declared passed, powers being also given to the company to make a short loop line at Uxbridge to form a connexion with the Metropolitan District Railway Company's proposed extension from Ealing to Uxbridge, which has already been sanctioned by the House of Commons. In the second Bill, which was an omnibus Bill, promoted by the Great Western Railway, that company and the Metropolitan Railway obtained leave to purchase land on the south side of Hammersmith Station and land adjoining the sidings at Paddington for the purpose of providing increased accommodation on the Hammersmith and City Railway. The committee also passed the Bill authorising the Metropolitan Railway to extend their Harrow and Rickmansworth Railway to Aylesbury, and thereby establish a new communication with Birmingham. The London and North-Western (Rickmansworth, Amersham, and Chesham) Bill was also passed, but the preamble of the Bill, promoted by an independent company, to construct a line from Uxbridge to Amersham and Aylesbury, was declared "not passed."

The parish-churches of Crediton and South Tawton are being restored by Mr. William Dart, builder, of Crediton.

Our Office Table.

Messrs. Measures Brothers & Co., of Southwark-street, have just issued a new sheet of sections of joists and girders manufactured by them. The sheet shows the actual sizes now kept in stock. The whole of the calculations as to strength have been carefully revised so as to give the safe distributed loads, and as far as it is possible to ascertain by calculation, verified by numerous actual tests, they are it is stated thoroughly reliable. Every section of joists has been loaded by dead weight to above the indicated load without any material deflection; and in no case where they have been loaded to four times these indicated safe loads has the joist broken or failed to sustain the weight. In some of the smaller sections the loads have been considerably reduced by comparison with those on previous sheets and books of sections. This is not because they will not carry the loads formely indicated, but with a view to specify a weight they will carry without material deflection. In the sheet are also shown several new combinations of Messrs. Measures Brothers' patent girders.

The purpose of watering macadamized roads is, says Mr. J. G. Hubbard in a letter to the *Times*, to lay the dust created by the grinding action of the traffic upon the broken granite, but it is a merit of wooden pavements that they yield no sensible amount of dust; watering them is, therefore, unnecessary. Although unnecessary water-carts are at this moment in active operation, costly vehicles of great bulk and strength drawn by superb horses, and in their resistless and undeviating course, obstructing the legitimate traffic of the wood-paved streets. Not only is the heavy cost incurred by their use needless; it is positively mischievous. The process of watering, like a summer shower, moistens the surface of the road, and makes it slippery and dangerous for horses. Wooden pavements should be swept, not watered; if kept clean (and it is easily effected), they require no other attention. It seems strange that the most perfect of pavements should have its merits ignored by a treatment inherited from a different system, pecuniarily wasteful to the street authorities and inconvenient to the public.

A correspondent of the *Daily Chronicle* gives a description of a church at Canterbury, which, if true, ought to delight the S.P.A.B. The church—that dedicated to St. Alphage—the attendance at the services in which (held once on alternate Sundays) averages about half a dozen, is in the very centre of Canterbury. Its windows are grimed with dirt, through which only dim rays of sunlight can penetrate to light up the loathsomeness within. The floor in many places has rotted and fallen in holes, and where it has not already gone is in a dangerous state. In one pew a "worshipper" had amused himself in pasting up labels, advertising the superior spirits and wines to be obtained at a neighbouring tavern. Another contained a piece of dirty calico; a third was the receptacle of a quantity of lumber and a register of gas; and in a fourth had been deposited a basket of coke, some firewood, and a worn-out broom. In another was a portion of a London newspaper, containing sporting and theatrical news; a sixth contained about half a bushel of cinders; in a seventh the flooring was nearly all gone, the seat covered with dirt, the floor littered with pieces of brickbats and a large paper bag. The vestry was open, with no one in charge, though the parish registers were lying about at the mercy of any mischievous visitor. Within the Communion-rails the floor was in a deplorable state, and in one place there is a hole a foot wide, probably one of the many entrances for the churchyard rats; the communion-table was propped up by odd pieces of rough wood; the books and the altar-cloth were dirty and uncared for, and there was a ricketty old chair in which it would not be wise to sit.

The 14th annual meeting of the Salisbury and South Wilts Building Society was held at the Council House, Salisbury, on Thursday in last week, when a report was read in which the directors congratulated the members upon the general confidence which the society continued to enjoy. During the year 75 new shares had been issued to investing members, of which 14 were fully paid-up shares. In the investing department money had been offered to the society in excess of its requirements. Borrowing members had taken up 38½ shares, and a larger number of these shares might have been issued, but the directors preferred to do a safe rather than a large business. The remarkable increase in house property in the neighbourhood of the city now presented favourable opportunities for purchasing. The balance-sheet showed receipts on the general account amounting to £59,847 17s. 7d., and there was a balance in banker's hands of £990 6s. 1d. The capital account showed receipts amounting to £13,950 7s. 11½d. The retiring directors, Messrs. Toomer and Bentlif, were re-elected.

Following up the successful commencement made last year, the Council of St. Paul's Ecclesiological Society have arranged for a series of Saturday afternoon visits to churches in London and its vicinity. The programme was issued yesterday, and is as follows, it being mentioned that the dates are subject to alteration:—April 30th—St. Andrew, Wells-street, and St. Mary Magdalene, Munster-square; May 14th—St. Helen, Bishopsgate; May 28th—Primer and Ruislip; June 11th—Berkhampstead, St. Peter, and Hemel Hempstead; June 25th—Rainham and East Ham; closing on July 9th with a whole-day excursion to Rochester. Papers are to be read at the Chapter-house, St. Paul's Churchyard, on the following Thursday evenings:—April 28th, by Mr. Edwin Freshfield, F.S.A., subject not yet announced; and June 2nd, by Rev. W. Sparrow Simpson, D.D., F.S.A., "Old St. Paul's, and some of its surroundings."

CHIPS.

The School Board for Llanwonno, near Pontypridd, discussed last week the condition of a school in course of erection at Penrhiwceiber, and great dissatisfaction having been expressed with the walling and other matters, a motion was carried summarily dismissing from his office the architect to the board, Mr. Jenkins, of Mountain Ash. The names of Mr. Lewis Edmonds and of Mr. Moses Cule were proposed as architects, and on being put to the vote, Mr. Cule was appointed, by five votes to three, to supervise the erection of the school in question.

The restoration and enlargement of St. Peter's Church, Bedford, are in progress, and will be completed in about three months' time. Mr. John Day, diocesan surveyor, is the architect, and Mr. W. Osborne, of St. Neot's Hunts, is the contractor.

At the Lancashire Quarter Sessions last week it was reported that the asylum committee had accepted a tender at £115,123, for the erection of an annexe accommodating 1,000 additional patients at the Rainhill county lunatic asylum.

A college is about to be erected at Quinton, from the designs of Messrs. D. Smith and Son, of Bennett's-hill, Birmingham.

A new stained-glass window has been placed at the east end of south aisle in St. Clement's Church, Ipswich, as a memorial. The subject is the Presentation of Christ in the Temple, Luke ii., and the work has been carried out by Messrs. Ward and Hughes, of London.

At the Central Criminal Court, on Saturday, Crawshey Crawshey, aged 36, surveyor to the Heston and Isleworth local board, was found guilty of having embezzled various sums of money belonging to the board, and was sentenced to two years' imprisonment with hard labour. The total amount of the prisoner's defalcations was stated to be £1,200, and they took the form of misappropriation of sums of money paid by the owners of land for making new roads in the district.

The Lambeth guardians received and considered, last week, plans prepared by Messrs. Coe and Robinson, whose designs were selected in competition, for enlarging the pauper-schools at Norwood; the architects explained that, by new blocks, accommodation for 800 children would be provided at an estimated cost of £50 per head. Several members suggested that the present buildings could be altered at a smaller expense, and others having proposed the erection of an entirely new group of schools, the further consideration of the matter was referred to a committee of the whole board.

A rearing-supper was held last week in celebration of the completion of the new Cumberland Union Bank premises at Ulverston, when Mr. Farmer, of the firm of Settle and Farmer, the architects of the building, took the vice-chair.

A special meeting of the St. Alban's town council was held on Wednesday week to open tenders for the construction of main sewerage works, in accordance with the plans prepared by Mr. Man-

sergh, C.E. It was suggested that the tenders be sent to the engineer for examination before one was selected, but one or two members thought this unnecessary. Mr. Chapple, ex-mayor and the clerk of works at the abbey, urged the desirability of submitting them to Mr. Mansergh, and it was decided to adopt that course. 22 tenders were opened, and will be found on another page; they ranged from £17,000 to £30,000. It was decided to advertise for a clerk of works, the salary to be £250 a year.

The Bourton-on-the-Water section of the Banbury and Cheltenham Direct Railway was officially inspected by Col. Rich, R.E., last week. The new line extends from a junction at Lansdown, near Cheltenham, with the Great Western Railway, to Bourton, and there are stations at Leckhampton-road, Charlton Kings, Andoversford, and Westfield. Along the 16½ miles of railway there are 60 bridges, a brick viaduct (over the Chelt) of 548ft. in 12 40ft. spans, and several minor arches, several deep cuttings, and a tunnel (under Dowdeswell-hill) 385 yards long. Messrs. Wilson and McIntyre have been the engineers. The original contractors for the line were Messrs. Lawrence and Co., who were succeeded by the late Mr. Terry; but the later and more important portions of the work have been executed by Mr. Lovatt, of Wolverhampton. One section of the undertaking, that from Chhipping Norton to Banbury, is still in progress.

M. Davioud, the architect of the Trocadéro and one of the two architects of the Paris Exhibition Building of 1878, now partly pulled down, died on Tuesday at the age of 57. He restored the mill in the Bois de Boulogne, and laid out most of the Paris squares.

Mr. Rogers Field, B.A., writes: "In the short account of the discussion on Mr. Collins' paper at the Institution of Surveyors, which you gave in your issue of April 1st, you state 'that Mr. Rogers Field defended the new Sanitary Protection Association.' I would ask your permission to point out that this is an error, as I did not say a single word as to this or any other association of the kind in the remarks I made."

ROYAL INSTITUTE of BRITISH ARCHITECTS.—Candidates who are desirous of being in time for the BALLOT, to be held on the FIRST MONDAY IN NOVEMBER, must send in their papers on or before SATURDAY, the 23rd inst., as the Nomination of Candidates for the November Ballot must be made at the Eleventh Ordinary Meeting of this Session. Members elected after the 31st of October must pay their entrance fee and first annual subscription before the last day of the year, but they are not required to pay any further subscription before the first day of the subsequent January twelvemonth.

J. MACVICAR ANDERSON, Hon. Sec.
WILLIAM H. WHITE, Secretary.
9, Conduit-street, Hanover-square, London, W.

MEETINGS FOR THE ENSUING WEEK.

SATURDAY (TO-MORROW).—Architectural Association's visit to Church of St. Mary Overie, London-bridge, S.E. 3 p.m.

TUESDAY.—Institution of Civil Engineers. Discussion on "The Actual Lateral Pressure of Earth-work." By B. Baker; and reading of paper on "The Relative Value of Upland and Tidal Waters in Producing Scour." By W. R. Browne. 8 p.m.

Lamplough's Pyretic Saline is refreshing, most agreeable, and the preventive of FEVERS, BILIOUSNESS, SMALL POX, SKIN DISEASES, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill. *Use no substitute* —[ADVT.]

Holloway's Ointment is not only fitted for healing sores, wounds, and relieving external ailments, but rubbed upon the abdomen it acts as a derivative, and thus displays the utmost salutary influence over stomachic disorders, derangements of the liver, irregularities of the bowels, and other intestine inconveniences which mar man's comfort.—[ADVT.]

Trade News.

WAGES MOVEMENTS.

SITTINGBOURNE.—The strike of brickmakers continues in Messrs. Smeed, Oran and Co.'s works. In the other brickfields of this district the men have resumed work; in one case voluntarily, and in another upon receiving a promise from the employers that increased wages shall be paid provided that the present price of bricks be kept up.

Doulting Freestone and Ham Hill Stone of best quality. Prices, delivered at any part of the United Kingdom, given on application to

CHARLES TRASK,
Norton-sub-Hamdon, Ilminster, Somerset.
—[ADVT.]

McLACHLAN & SONS, 35, St. James's street, S.W. Builders, Decorators, and House Painters. Designs and Estimates.
General Repairs and Alterations Executed. Experienced Workmen always in readiness, and sent to any part of the country.—[ADVT.]

BATH STONE.
BOX GROUND,
THE BEST FOR ALL EXTERNAL USE.
CORSHAM DOWN
CANNOT BE SURPASSED IN BEAUTY OF APPEARANCE FOR INTERIOR WORK.

PICTOR & SONS, BOX, WILTS.
(See trade advt. on p. XXV.) [ADVT.]

TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender—it adds to the value of the information.

ALDERSHOT.—For metalling, kerbing, channelling, draining, lighting, and tar-paving Pickford street and Crimea-road. Mr. W. L. Coulson, surveyor:—

Cranston, I., Aldershot	£762	0	0
Free, T., High Wycombe*	643	0	0
For ditto as above to Union-terrace,			
Free, T.	£73	16	10
Cranston, I.*	65	10	0

*Accepted.

ALDERSHOT.—For building brick barrel drain in Malthouse-lane, Mr. W. L. Conlson, surveyor:—

Cranston, I., Aldershot	£159	0	0
Garland, W., Aldershot, ...	139	0	0
Kemp, G., Aldershot (accepted) ...	129	0	0

BATTERSEA.—For rebuilding the Princes' Head public-house and erecting three shops with residences, &c., York-road, Battersea. Mr. H. I. Newton, architect:—

Walker	£6,070	0	0
Taylor	5,920	0	0
Grimwood	5,895	0	0
Shurmur	5,868	0	0
Langmead and Way	5,765	0	0
Godden	5,715	0	0
Lamble	5,679	0	0
Mattock Bros.	5,333	0	0
Burman	5,207	0	0
Cooper	4,995	0	0
Gill	4,987	0	0
Pickersgill (accepted)	4,944	0	0

BEAUMARIS.—For the erection of two dwelling-houses for Sir Richard Bulkeley, Bart. Mr. R. G. Thomas, architect, Menai Bridge:—

Jones, Evan	£1750	0	0
Williams, D.	1590	0	0
Owens and Edwards	1500	0	0
Parry, Lewis	1437	0	0
Jones, R., and Owen, D.	1200	0	0
Jones, W.	995	0	0
Humphrey, W., Beaumaris* ...	926	0	0

*Accepted.

BERMONDSEY.—For alterations to house and the addition of cellar, shop, and rooms over same, on the forecourt of No. 190, Southwark Park-road, S.E., for Mr. J. Morgan. Mr. E. Crosse, architect, Bermondsey-square:—

White, S. (accepted)	£300	0	0

BLOOMSBURY.—For alterations and repairs to St. Giles's and Bloomsbury baths and wash-houses, London. Mr. Alfred R. Pite, architect, 44, Bloomsbury-square, W.C.:—

Larter and Son	£1,050	0	0
Patman and Fotheringham ...	984	0	0
Cowland Bros.	954	0	0
Hobson	896	0	0
Staines and Son	886	0	0
Faulkner (accepted)	885	0	0

BOVEY TRACEY, DEVON.—For the construction of Garworks for the Bovey Tracey Gas Company:—

For erection of Works:			
Mardon, J., Builder, Bovey Tracey*	£656	0	0

*Accepted.

For Gas Apparatus, Mains, &c.:			
Hilley and Co., Exeter (accepted)	£605	0	0

BRIXTON.—New shop fronts and alterations to No. 3, Shepherds-lane, Brixton, for Mr. G. Meadows. Mr. J. William Stevens, 6, Southampton-buildings, architect:—Pack Bros. (accepted). No competition.

BROMLEY-BY-BOW, E.—For rebuilding class-rooms, and providing new cloak-rooms, and for warming apparatus, at the Byron-street Schools (late St. Michael's National Schools), for the London School Board. Mr. E. R. Robson, F.S.A., architect to the Board:—

Atherton and Latta, Poplar (accepted) ...	£2,850	0	0

BURHAM.—For the erection of new church, Burham, Kent. Mr. E. W. Stephens, F.R.I.B.A., architect, Maidstone:—

Walliss and Clements, Maidstone.	£4,970	0	0
Foord and Son, Rochester... ...	4,763	0	0
Avard, Maidstone	4,667	0	0
Callund and Son, Rochester ...	4,650	0	0
Vaughan, Maidstone	4,591	0	0
Hammond, Aylesford	4,444	0	0
Naylar and Son, Rochester* ...	4,241	0	0

*Accepted.

CAMBERWELL.—For making alterations and additions to the transferred school in Camberwell-road (formerly Emmanuel Church School), in order to make it efficient as an infants' department, for the London School Board:—

Hobson, J. D, ...	£2,646	0	0
Downs, W.	2,617	0	0
Nightingale, B. E.	2,562	0	0
Lathey, Bros.	2,500	0	0
Tyerman, J.	2,471	0	0
Higgs and Hill*	2,424	0	0

* Reduced tender accepted at £1,252.

CLACTON-ON-SEA.—For enlargement of the Imperial Hotel for W. W. Daniell, Esq. Mr. G. Gard Pye, architect:—

Pollard, R., Clacton	£348	0	0
Everett, H. and Son, Colchester ...	324	0	0
Beard, J., Chapple (accepted) ...	300	0	0

CHILDWALL.—For the erection of farmhouses at Childwall, for the Most Honourable the Marquis of Salisbury, K.G. Mr. Thos. J. Turpin, Surveyor. Quantities supplied by the Surveyor.

Contract No. 1.			
Tomkinson, W., & Co., Liverpool	£1,007	0	0
Webster, R., Huyton	951	0	0
Lothian, W, Broad Green ...	931	0	0
Gore, W., Little Wootton	896	0	0
Rothwell, J., St. Helen's	867	0	0
Tyson, T., Liverpool...	826	10	0
Webster, T., Wavertree	796	10	0
Hill, T. F., Wootton	791	0	0
Olver, W., ,, ...	785	0	0
Houghton, J. ,, ...	783	0	0
Moore, J., Wavertree	755	0	0
Contract No. 2.			
Beecham, J., Liverpool	£1,077	16	5
Jones, G. and F., Garston	1,065	0	0
Webster, R., Huyton	1,040	0	0
Hill, T. F., Wootton	936	0	0
Olver, W. ,, ...	927	0	0
Houghton, J., ,, ...	922	0	0
Moore, J., Wavertree	916	0	0
Rothwell, J., St. Helen's	902	0	0
Tyson, T., Wavertree (accepted) ...	889	0	0
Webster, T., Wavertree*	845	0	0

* Withdrawn.

The above estimates do not include boundary-walls, gates, or surface drainage and paths.

COLCHESTER.—For alterations and additions to East Mills, for Messrs. Marriage and Son. Mr. E. Burgess, Great James-street, Bedford-row, W.C., architect:—

Saunders and Son, Dedham ...	£1,060	0	0
Dupont, F., Colchester	957	0	0
Dobson, G., Colchester	945	0	0
Everett and Son, Colchester ...	897	10	0

CRIEFF, N.B.—For the erection of an Established Church in Strathearn-terrace, Crieff. Accepted tenders;—

Mason; Cousin, of Alloa.
Joiner: Auld and Craig, Motherwell.
Slater: Phillips, J. and T., Crieff.
Plasterer: Hobson, Auchterarder.
Plumber: Anderson, C., Crieff.

DARWEN.—For erection of new schools, outbuildings, and boundary-walls for St. James parish. Mr. W. Perry, architect, Market-street, Darwen, and Low-street Chambers, Southport:—

For the whole contract:—			
Lloyd and Millward...	£1,671	10	0
Mason, bricksetter, carpenter, and joiner:—			
Emerson, Hornsby	1,540	0	0
Mason and bricksetter:—			
Lloyd and Millward, Blackburn-road, Darwen (accepted) ...	900	0	0
Knowles, J.	900	0	0
Entwistle and Johnstone	880	0	0
Kay, W.	875	0	0
Entwistle, J. T.	870	0	0
Orrell, J. and Sons	806	0	0
Cooper, G.	747	0	0
Carpenter and joiner:—			
Orrell, J. and Sons	585	16	0
Rucklidge, T.	573	0	0
Shorrock, R.	540	0	0
Marsden, L. R....	530	0	0
Kay, W....	499	10	0
Entwistle and Johnson	490	0	0
Pilkington, J.	475	0	0
Lloyd and Millward, Blackburn-road, Darwen (accepted) ...	458	0	0
Harwood, S.	454	0	0
Slater:—			
Lloyd and Millward	157	0	0
Kay, W.	155	15	0
Orrell, J. and Sons	155	15	0
Baron, H.	155	15	0
Miles Eccles, Melbourne-street, Darwen (accepted)	143	0	0
Heavyside, J.	123	14	0
Plumber and glazier:—			
Knowles, J.	70	0	0
Kay, W.	70	0	0
Robinson, T.	69	0	0
Lloyd and Millward	68	0	0
Entwistle, R.	66	0	0
Briggs, J. S., Railway-road, Darwen (accepted)	61	10	0
No name or address	55	0	0
Plasterer and painter:—			
Jackson, R.	130	0	0
Lomat, W.	120	0	0
Battersby, R.	103	15	0
Watson, J., Redearth-road, Darwen (accepted)	90	0	0
Lloyd and Millward	88	10	0

DARWEN.—Five dwelling-houses at Hollinsr-grove, Darwen, for the Industrial Co-operative Society, (Limited):—

Accepted tenders.			
Mason, bricksetter, &c.:—			
Entwistle, J. T.	£875	0	0
Joiner and carpenter:—			
Harwood, Seth	320	0	0
Slater:—			
Eccles, M.	61	10	0
Plumber, glazier, and gas-fitter:—			
Entwistle, R.	69	0	0
Plasterer and Painter ...	110	0	0
Total ...	£1,435	10	8

DONCASTER.—For the erection of a new gas-tank, 152½ft. in diameter, for the corporation. Mr. R. Bridge, engineer:—

Arnold, H. (accepted).
[Lowest tender received.]

DUBLIN.—For constructing, asphalting, and kerbing footways around the South City Markets, for the Dublin town council:—

	Stone Kerbing. Per foot lin.	½in. Asphalte. Per yard super.
Murphy	£0 2 0	£0 6 8
Worthington (accepted)	0 1 5	0 5 6

Dunswell.—For the erection of mixed school at Dunswell for 75 children, for the Cottingham School Board. Mr. John Kirk, architect to the Board :—

Witty, F., Cottingham	£765 7 0
Wright, P., Cottingham	664 12 0
Coverdale, A., Cottingham	663 12 0
Pearson, R., Hull	557 8 0
Wray, R., Hull	550 0 0
Berry, H., Newington	549 14 0
Coalson, G., Hull	547 17 0
Wharram, W. G., Hull	545 0 0
Hird, D., Hull	540 0 0
Smith, F., Beverley	498 0 0
Wilkinson, R., Newland	492 5 0
Goats, Hull (accepted)	492 4 0

Dorking.—For repairs at Arnold's, Bear Green, for Mr. E. Kerrick, J.P. Mr. J. Cloutman, architect :—

Holden, Holmwood	£420 7 0
Colls and Sons	372 10 0
Bargman and Son	357 15 0

Forfar.—For the erection of a lodging-house in Coutti's Wynd, for the town council :—

Adamson (accepted)	£257 0 0

[The lowest tender, that of MacIntosh, £233, was accepted on March 18th, but has since been withdrawn].

Greenwich.—For the erection of a school for 1,000 children in Cold Blow-lane, Greenwich, for the London School Board. Mr. E. R. Robson, F.S.A., architect to the board :—

Higgs and Hill	£10,944 0 0
Wood, F. and F. J.	10,510 0 0
Kirk and Randall	10,195 0 0
Hobson, J. D.	10,108 0 0
Tongue, W.	10,006 0 0
Brass, W.	9,994 0 0
Shepherd, W.	9,882 0 0
Jerrard, S. J.	9,793 0 0
Wall, C.	9,759 0 0
Harris and Wardrop	9,729 0 0
Atherton and Latta, Poplar*	9,600 0 0

*Accepted.

Cost of site (area 36,370 square feet), £2,281 10s.; (*a*) cost of school buildings only, including closets, £7,624; (*b*) cost of tar pavement and playground, £579; (*c*) cost of boundary walls and gates, £634; (*d*) cost of teachers' rooms, £300; (*e*) cost of schoolkeeper's house, £350; special expenditure chargeable to site, raising level of playground, and providing additional depth of boundary-wall, £113; total, £9,600. Cost per head of (*a*) only, £7 12s. 5d.; total cost per head, £9 12s.

Hackney.—For the erection of eight houses and shops in Mare-street, and three shops in The Grove, Hackney. Mr. Sydney L. Walters, architect :—

Lawrence	£8,880 0 0
Conder	8,798 0 0
Brown	8,750 0 0
Bangs	8,600 0 0
Morter	8,557 0 0
Shurmur	7,785 0 0
Johnson	7,651 0 0
Boyce	7,450 0 0

Hastings.—For the erection of a theatre, with subsidiary and other premises at Queen's-road, Hastings, for Mr. George Gaze. Messrs. Cross and Wells, architects, Hastings. Mr. C. J. Phipps, F.S.A., consulting architects :—

King and Son	£11,980 0 0
Patman and Fotherington	10,377 0 0
Womersley	9,600 0 0
Geary	9,522 0 0
Cruttenden	9,346 0 0
Higgs	9,250 0 0
Vidler	9,237 0 0
Howell and Son	9,100 0 0
Jones and Co	8,970 0 0
Rodda	8,680 0 0

Islington.—For the enlargement of the Shepperton-road school, Islington, for the London School Board. Mr. E. R. Robson, F.S.A., architect to the board :—

Brass, W.	£3 977 0 0
Pritchard, G. and S.	3,976 0 0
Roberts, L. H. and R.	3,864 0 0
Lawrance, E.	3,794 0 0
Williams, G. S. S. and Son	3,778 0 0
Kirk and Randall	3,728 0 0
Wall Bros.	3,707 0 0
Grover, J.	3,682 0 0
Wood, F. and F. J.	3,662 0 0
Atherton and Latta, Poplar*	3,425 0 0

* Accepted.

(*a*) Cost of enlargement, including closets, £3,224 10s.; (*b*) cost of tar pavement and playground, £39; (*c*) cost of boundary-walls and gates, £66 10s.; special expenditure chargeable to site—extra depth of foundations, £95; total, £3,425. Cost per head of (*a*) only, £7 17s. 6d.; total cost per head, £8 7s. 5d.

London.—For alterations, &c., to the Gun public-house, Brushfield-street. Messrs. Wilson, Son, and Aldwinckle, architects :—

Shurmur	£360 0 0
Marr	284 0 0

London, E.—For building shed at rear of No. 1, Cable-street, for Messrs. Fairclough and Son. Messrs. Wilson, Son, and Aldwinckle, architects :—

Palmer	£745 0 0
Colman	715 0 0
Hearle	676 0 0
Cox	642 0 0
Shurmur	639 0 0

Leicester.—Four shops on London-road, Leicester, for Mr. F. Crick. Messrs. R. J. and J. Goodacre, architects :—

Bland, J. and Son	£5,730 0 0
Clark and Garrett	5,630 0 0
Hutchinson	5,470 0 0
Elliott	5,375 0 0
Herbert, Leicester (accepted)	5,350 0 0

[Exclusive of ironwork.]

Liskeard.—For the erection of schools in Barley-lane, for the School Board :—

Trehone, Sampson, of Liskeard*	£2,050 0 0

* Accepted.

[The tender of Northfleet and Son was originally accepted at £1,758, as stated in these columns at the time, but that tender was amended to £1,950; the Board, on the 29th ult., declined to take the tender as altered, but accepted the next lowest.]

Loughborough.—For alterations and additions at Southfield, Loughborough, for W. B. Paget, Esq. Messrs. R. J. and J. Goodacre, architects :—

Black, Barrow	£3,975 0 0
Dennett and Ingle, Nottingham	3,873 0 0
Herbert, Leicester (accepted)	3,860 0 0

Loughton.—For the sewerage of a portion of the town for the Epping rural sanitary authority. Mr. E. Egan, of Loughton, engineer :—

Wood, of Chelmsford (accepted)	£490 0 0

[Lowest of four tenders, of which the highest was £600.]

Maidstone.—Proposed new shop and residence, Tonbridge-road, Maidstone, for Mr. T. Banks. Mr. E. W. Stephens, F.R.I.B.A., architect :—

Simmonds, Maidstone	£2,380 0 0
Callund and Son, Rochester	2,375 0 0
Hammond, Aylesford	2,362 0 0
Naylar, Rochester	2,357 0 0
Elmore, Maidstone	2,340 0 0
Wallis and Clements, Maidstone	2,334 0 0
Vaughan, Maidstone	2,149 0 0
Cox Bros., Maidstone	1,915 0 0
Avard, Maidstone	1,895 0 0

Margate.—The New Globe Hotel, Margate, for Mr. F. Snelling. Mr. Edward Clark, architect, 432, West Strand, W.C. :—

Contract No. 1 Foundations.

Rolfe, G. S. R., Margate	£5,128 16 8
Sawyer, J. W., London	4,942 0 0
Macey, London	4,505 0 0
Manley, M., London	4,156 0 0
Paramor and Son, Margate	4,000 0 0
Denne, Upper Walmer	3,987 0 0
Adcock, W. J., Dover (accepted)	3,948 1 0

Merthyr.—For extension of supply of water from Dowlais to Vochriev, for the Merthyr rural sanitary authority :—

For supply of 1,750 two-inch cast-iron socket-pipes, each 6ft. long :—

Spittle and Co., Newport (accepted) £4 10s. 0d. per ton.

For exaavation and laying pipes :—

Williams and Jenkins, Pontypridd (accepted).

Neath, S. Wales.—For the erection of retaining wall at Taibach, for the Neath Highway Board. Mr. C. W. Campion, surveyor :—

Jenkins, D. and Thos., Taibach*	£50 3 0
Thomas, Wm., Galltown	50 0 0
Jenkins, Rees, Bryngyrnos	40 0 0

* Accepted.

Newmarket, Cambs.—For completing the formation of the sewage filtration areas for the local board of health :—

Williams, T., Kennett	£398 6 8
Whitmore	395 10 6
Hook, G., Soham (accepted)	325 0 0

Newport, Mon.—For inclosing the gridiron, for the Newport harbour commissioners :—

Railings :—

Stone and Sons (accepted)	£89 1 0

Masonry :—

Linton (accepted)	48 10 0

Ystradyfodwg.—For inclosing and other works at the new cemetery at Lledrddru, for the burial board :—

Jenkins, C. and Son (accepted).

Paignton, Devon.—For making a footpath, for the local board :—

Drew, C. and R. E. (accepted)	£52 10 0

Pontypridd.—For the construction of a reservoir at Castell-y-Nos, Blaen Uechan, for the Pontypridd Waterworks Company :—

Kraus, A., of Bristol (accepted).

[Lowest of six tenders.]

Penge.—For alterations and additions to coach-house and stables. Mr. T. W. Garrood, architect :—

Parham	£275 0 0
Mears	235 0 0
Kemp	177 10 0
Wootton	167 0 0
Smith and Sons	158 0 0
Hollidge and Stewart (accepted)	150 0 0

Reading.—For new chapel, operating-room, and other works at the Royal Berkshire Hospital, Reading. Messrs. Morris and Stallwood, architects. Quantities supplied :—

Clarke and Bracey	£4,636 0 0
Braid and Co.	4,625 0 0
Brass	4,475 0 0
Shaw	4,229 0 0
Clements	4,100 0 0
Rider and Sons	4,099 0 0
Silver, R. and Sons	4,057 0 0
Claridge	3,850 0 0
Filewood	3,794 0 0
Parnell and Son	3,719 0 0
Simonds, W. H.	3,663 0 0
Kimberley	3,652 0 0
Searle	3,557 18 0
Sheppard (accepted)	3,482 0 0

Romford.—Detached villa, Junction-road, Romford, for Mr. J. Manttan, Esq. Mr. J. William Stevens, A.R.I.B.A., 6, Southampton-buildings, Holborn, architect :—

Dowsing	£1,052 0 0
Frost and Co.	1,042 0 0
Hamlin	957 0 0
Davey	940 0 0
Hollands	845 0 0
Boyd	825 0 0
Wood	815 0 0
Barton	800 0 0
Beale	796 0 0
Hinds	738 0 0
Impey (accepted)	600 0 0
Ayres	570 0 0

Ross, Herefordshire.—For making-up Alton-street, for the Ross Improvement Commissioners :—

Weaver, W. D.	£39 10 0
Bird, H.	33 2 1
Minton, F. (accepted)	31 5 0

Selby.—For alterations and additions to premises, Finkle-street, Selby, for the York City and County Banking Company. Mr. C. Anderson, Architect, 12, Leudal, York, the whole of the work :—

Weatherley, R., York	£584 17 3
Walker, R., York	474 0 0
Spencer, A., and Co., York	460 0 0
Ullathorne, J., Selby	458 0 0
Grange, G., Otley	455 0 0
Simpson, J., York (accepted)	452 0 0

Southwark.—For rebuilding No. 25, Newington-butts, for Mr. Charles Polden. Messrs. Muggeridge and Powell, architects :—

Fisher	£1,147 0 0
Smith	1,057 0 0
Canning and Mullins (too late)	996 0 0
Castle	990 0 0
Pyke	905 0 0
Burman (accepted)	879 0 0

St. Alban's.—For the construction of main sewerage works for the city council. Mr. Mansergh, engineer :—

Botterell, W. J., 110, Cannon-st.	£30,075 0 0
Kellett and Bentley, Ealing	29,449 7 0
Neave, J. and Sons, Fulham-rd.	27,957 6 9
Nowell and Robson, Kensington	25,083 1 5
Harris, W., Camberwell	24,963 2 7
Simmons, J., Sidcup, Kent	24,633 9 0
Potter, H., Lower Clapton	23,577 8 0
Neave, J. W., Lewisham	22,996 3 9
Killingback, C., Camden Town	22,965 13 1
McKenzie & Co., Moorgate, E.C.	22,651 4 3
Foster & Barry, Market Harboro	22,359 11 6
Dickson, J., Sevenoaks	22,185 13 1
Rayment, J. J. & Son, Hertford	21,731 8 11
Stevenson, J., Dartford	21,496 2 0
Currall, J., and Lewis, G., Birmingham	21,249 9 1
Smart, T., Nottingham	20,871 0 2
Dawson, F., Bury, La cashire	20,051 15 0
Holland, W., Leicester	19,964 0 9½
Dobbs and Gummer, Rotherham	19,664 1 0
Raynor, J. G., Liverpool	19,474 8 0
Smith, J. M., Westminster	18,890 0 0
Bell, G., Gateshead	16,985 8 9

Upton Pyne.—For the erection of two semi-detached Dwellings at Upton Pyne, Devon, for the Right Hon. Sir S. H. Northcote, Bart., M.P., &c. Mr. James German, Associate and Graduate, R.I.B.A., Architect, 19, Queen street, Exeter :—

Scadding, H. J.	£750 0 0
Gibbard, J. R.	587 0 0
Dennis and Short	520 19 0
Webber and Stephens (accepted)	474 12 0

[*For remainder of* Tenders *see p.* XVIII.]

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THE BUILDING NEWS.

LONDON, FRIDAY, APRIL 15, 1881.

THE BANKRUPTCY BILL.

MR. CHAMBERLAIN has abundantly proved his position that the reform of the law of bankruptcy is urgently needed by the commercial classes. For some seven or eight years past the Act of 1869 has been unanimously condemned as a failure, and a positive encouragement to all kinds of fraud and swindling. Now, at last, there seems a certainty that the good time has come, and that this scandal will no longer rest upon the legislation of a great commercial country. It may be regretted that the Bill is merely one of amendment, and not of consolidation; but the shorter the better for its chance of passing. Its main proposals are that the Board of Trade shall administer a bankrupt's estate; that liquidations and compositions be abolished; and that a real Chief Judge in bankruptcy should be appointed. The only actual novelty in the whole scheme is as to the interference of the Board of Trade. It is well known that the Act of 1861, as drawn by Lord Westbury, contained clauses as to a Chief Judge, which its author thought of vital importance, and the rejection of which, to his mind, ruined the whole measure. There is no doubt that he was quite right in his opinion, and this was admitted in the Act of 1869. But, though the theory of that statute was sound enough, it was not fairly carried out in practice. Vice-Chancellor Bacon has never even had the opportunity of really acting as Chief Judge. He gives one day in the week to the duties of that important office, and lets the registrars exercise judicial functions for which they were never intended, upon all other occasions. The Bill proposes to appoint a commercial lawyer to the post of Chief Judge, and to make the registrars his chief clerks, when they would be placed in their proper position and do work for which they are doubtless well fitted.

It is probable that the new Chief Judge will be empowered to make and alter rules of Court in the same way as is usual in the Divorce division. If this is done, then, should a really suitable man be chosen, there will be some chance of the statute being practically successful. The Bill proposes a change in the present mode of appeal, to which there seems no objection. This will leave the appeal from the London Court to the Lords Justices as it is now, but will send parties from County-courts straight to the Court of Appeal, without going first to the Chief Judge. The abolition of this intermediate appeal would certainly be an advantage from every point of view, while the suggestion that the Chief Judge should sit with the Lords Justices when hearing County-court appeals, so that his practical experience might always be available, does certainly seem founded upon common-sense, and likely to work out successfully.

All proceedings in bankruptcy are to be begun by the same form of petition. But, since the Bill will abolish liquidations as now existing, it enables a debtor to petition on his own account, in this respect returning to the Act of 1861. The whole measure is framed in the interests of creditors, and against debtors; so we find the petitioning creditor's debt is reduced from a £50 to a £20 limit. Debtors' summonses are to be done away with; but non-payment of a judgment debt after a fifteen days' demand, and execution to any amount by any amount debtor, are made acts of bankruptcy—two very sweeping alterations which are likely to give rise to much discussion.

Immediately upon adjudication the bankrupt's property will vest in an official receiver appointed by the Board of Trade. Registrars will be used for this purpose; and the plan is but a copy of the old system of messengers, with the difference that the administration of assets will be in the hands of the Board of Trade, while the Court of Bankruptcy exercises only judicial functions in the matter.

The bankrupt is to file a statement of his affairs and a list of his creditors within three days, as under the old Insolvency Acts, and the first meeting is to be called within seven days after adjudication, which is certainly a prompt proceeding. Proxies must still, of course, be allowed, but an effort will be made to put down their abuse. Every proxy is to be upon an official form, and available only for the meeting specified therein. It must not be given to the debtor's solicitor, nor used by any person to vote himself trustee. These are ingenious provisions, but they can, obviously, be easily evaded. At the first meeting the creditors may accept a composition, or a scheme of arrangement, by the resolution of a majority in number and three-fourths in value. But the composition must not be less than five shillings, while either form of arrangement will have to be confirmed at a second meeting, after hearing a report upon the bankrupt's character and conduct from the official receiver; and the Court can refuse to ratify the resolution if it thinks fit. If the creditors do not accept the bankrupt's proposals, then they are to elect a trustee and proceed as in an ordinary bankruptcy.

The Bill is full of elaborate provisions, aimed at keeping these trustees in order, which look well enough on paper; but, as experience has often shown, do not come out so strongly in practice. But as the Court will take this matter out of the hands of the creditors, something may be done to compel reasonable honesty, even amongst professional trustees. Every trustee will be bound to give security, and will be under the sharp supervision of the Board of Trade, and removable in case of unfitness, misconduct, or collusion with creditors, though he is to be allowed an appeal from the Board to the Court. The trustee's remuneration will be fixed by schedule, and all moneys over £50 are to be paid into the Bank of England. This is the rule at present, if the creditors so resolve, which they seldom, or never, do. But we believe there is the difficulty that the bank refuse to open small accounts of this kind, even with trustees in bankruptcy. All bills of every description are to be taxed, and the accounts of a trustee will be audited half-yearly by the comptroller. These provisions are much wanted, and they would get rid of the present anomalous state of things under which the court and the comptroller have no power over trustees in liquidation.

Every bankrupt is to be publicly examined in court as to his affairs, and the Court will have power to grant, refuse, or suspend his tender of discharge, or to qualify it with conditions as to his after-acquired property. If this applies to debtors whose creditors have accepted either a composition or a scheme of arrangement, it is indeed a stringent proceeding. But, for the rest, it is only a return to the sound provision of the older statutes of 1859 and 1861, which ought never to have been repealed. The Court is to be able to order a prosecution if it think fit, and even to commit the bankrupt for trial without applying to a magistrate. If it be proved that all debts have been fully paid, or if the Court think that bankruptcy was brought about by misfortune, it may be annulled. But, otherwise, the civil disabilities entailed upon a bankrupt will be increased, and Members of Parliament, Mayors, and persons holding public offices will vacate their seats, and not be eligible for re-election for seven years. The cost of the official administration of bankrupts' estates will be added to by the new procedure as proposed. This is to be met by the interest on undivided balances, a fixed fee upon small estates, and a percentage upon larger matters.

The Bill also contains clauses relating to the administration in bankruptcy of the estates of deceased persons, limiting the rights of bill-holders, and dealing with onerous property and disclaimers, which will have to be carefully considered in detail. It is, obviously, a measure framed in the old-fashioned spirit of hostility to insolvent debtors, and is, in short, a reaction from the leniency of the present system. It would give to the Court all the powers now lodged with creditors generally; but then, those powers would probably be actively employed instead of being allowed to rust away for want of being used. The Bill has been spoken of as a return to the practice of officialism, as under the older statutes; and so it is, most unquestionably. But then, the other method has been tried quite long enough to show its utter failure. Creditors who admired the Act of 1869 because it placed all power in their hands, have now found out that they cannot themselves use that power effectually. It is in the nature of things wholly impossible for men of business to waste time and trouble in looking after their insolvent debtors, while the throwing good money after bad is by no means a popular practice. But, if the administrators of bankrupts' estates be taken in hand by the Board of Trade with vigilance and vigour, we shall soon see a very different state of things. Property will not be so easily hidden away from the sharp eyes of an official experienced in such matters, neither will bills of costs and charges come out so big after a proper taxation. The Chief Judge is to exercise wide powers of control over bankrupts, while the Board of Trade will look after trustees. Public policy and commercial morality are both affected by frequent and dishonest failures, and the true principle should be to make bankruptcy a disgrace to every debtor. We hope care will be taken in putting the rules as to proxies into practical shape, so that they may be really effectual; for the present looseness upon this point is one great cause of the scandalous state of things. Taken as a whole, the Bill seems sound and suitable for its purpose, and all creditors and honest debtors will be glad to see it passed through Parliament during this Session.

FINE-ART EXHIBITIONS.

MANY creditable drawings in water-colours appear on the walls of the exhibition of the elder Society of Painters, 5A, Pall Mall East, and among the number of exhibitors we notice the names of several well-known members who have contributed to the present school of water-colour painting, while in the list of associate exhibitors two new names meet us, George du Maurier, well-known by his sketches in *Punch*, and Wilmot Pilsbury, whose work entitles him to rank as a painter of promise in the modern landscape school. E. K. Johnson, always charming in simple incident and brilliancy of colour, this year attracts the visitor with two cleverly-painted figure subjects. "While Lubin is away" (4) tells its own tale prettily. The fair-faced summer-clad young wife, with black fichu and white cap, leaning against the side of her cottage-door looks rather disconsolate in spite of her fair, bewitching looks; while "Pleasant Hours" (63), two lightly-dressed sisters, the elder nursing the younger in her lap, in a garden surrounded by

roses in full bloom, is also a summer fancy, drawn with a genial finish. Those interested in the quaint gables and picturesque architecture of the Netherlands, will find some interest in Albert Goodwin's sober-coloured view of Dordrecht (6), in South Holland, a gleam of sunshine lighting up the red-tile roofs. Birket Foster, in his usual facile touch, contributes two of the most attractive pictures on this side of the room, both remarkable for their freshness of colour and sunny sparkles of light, "The Stepping-stones" (9), and especially the "Old Water Mill" (15), with the figure of a stooping girl, with pitcher in the rushing stream, and spring foliage, are clear and brilliant in tone, and gain by comparison with other drawings which affect oil-like depth of tone and colour in accordance with recently received notions. Two marine subjects refresh the eye here. H. Moore, in his "Light Breezes" (13), charms us by his fine rolling sea of deep blue and reflected light on the waves. These are with him always true to nature, and the picture made up of sea and cloud is a masterly study. "Low Water," by Arthur Hopkins, and a "Fresh Day on the Coast," by C. Davidson, are equally dexterous in their careful study of sea effect. We cannot appreciate the fantastic glare and redness in Samuel Palmer's two imaginative subjects from "L'Allegro"—"The Prospect" (18) and "The Eastern Gate." Their unnatural glow of ruddy colour is overpowering, and certainly does not seem to us to suggest the delicacy of thought conveyed in Milton's mind. The "Russet lawns and fallows grey" are scarcely realised in the flaming scenes. T. M. Richardson's "Bellagio, Lake of Como" (20), on the other hand, strikes us as too subdued in tone for an Italian sky; his views in Aberdeenshire (55) and Perthshire are more in keeping. Few of the landscapes compete with "The First Furrow" (23), "Over the Hills and Far Away," (93), "Cornfield, Sussex," "Valley of the Arun" (166), by R. Thorne Waite. A fine breadth of handling and solid colouring in a low key are characteristic of this artist's work, and his distances, as in 23 and 112, are always happy. Grey in tone, and clever in the reflected light is F. Powell's "Opposite the Setting Sun," while G. P. Jackson's "Conway Bay" is noticeable as a skilful rendering. There are few delineators of picturesque Continental architecture who are equal in sketchiness and purity of colour to W. Callow. His "Haddon Hall" and "Piazza dei Signori, Verona" (30), "Sketch of the Church of the Fratri, Venice" (126), "Great Church of St. Lawrence" (173) are masterly sketches in outline filled in with transparent washes of greys and browns in a manner which reminds us of the work of Prout. Well grouped and harmonious in colour, the last drawing is worthy to rank as one of the best of this master. "The Arsenal, Genoa" (40), by Collingwood Smith, is a bright and sunny view of a picturesque locality. Otto Weber's "Mid-day Meal" (34), is a skilfully-drawn group of horses and labourers partaking of refreshments after a hard morning's work, not without feeling. Several landscapes are shown here. A fresh-looking sketch of a Sussex lane, down which a calf is walking, is pleasantly coloured in the naturalistic manner of the painter, E. A. Waterlow. Mrs. Allingham's "Clothes-basket" (48), is also a simple transcript of nature, drawn and coloured with much feeling, and T. J. Watson's "Wooded Landscape" (53), is noticeable also for the solid colouring and breadth of treatment it displays. A large view "Der Hallstadtter See" (57), by Sam T. G. Evans, arrests attention at this part of the room, for its fine luminous colouring. The lake and houses have an expression of warm southern sunshine, and there is much that is picturesque and sympathetic in the rendering. Mrs. Angele, inimitable as a flower-painter, exhibits several lovely pieces; the "Roses in Turquoise Pot" (54). "Fruit and Flowers" (60), the "Azaleas (163), "Chrysanthemums" (171), and especially the fresh-looking primroses and violets in a glass of clear water, entitled "Spring," on the second screen, are as delicate in grouping and colour as they are tenderly painted. D. Cox's Welsh sketch (62); "The View of Mont Blanc from Chamounix," by W. Collingwood (64); E. A. Waterlow's study, "After Work" (65); and "Autumn Twilight," by W. M. Hale, are creditable performances; the two last displaying much sentiment and grasp. We also note a pleasing bit, "Duddon Bridge," by C. Rigby, "Oatfield," by C. Davidson, and a fine little study of light and broad shadow in Clara Montalba's "Winter Day, Venice" (69). Two subjects, illustrative of historical incident, meet us in Oswald W. Brierly's "Battle Fought off Gravelines between the English Fleet and Spanish Armada," and in No. 86. Paul F. Naftel's charming moorland sketch (87) is a masterly study of broad heathery masses, rich in colour; his views in the Pyrenees (128, 89), also show dexterous manipulation and technical ability in the management of colour. That favourite theme of the artist, "Whitby," is made the subject of two drawings. A. Hunt's ruddy evening effect, and his "Sullen-Looking Night" (202), are truthful antitheses in tone and atmospheric effect. We can only cursorily glance at Carl Haag's "Night in Egypt" (110); George A. Fripp's cleverly executed "Sonning Weir" (97 and No. 162); Alfred D. Fripp's "Mending Nets" (103); Sir John Gilbert's "Standard Bearer," and "Gipsy Encampment" (113), in both of which we find the same free outline and rich colour which distinguish previous works of this inventive artist of historical subjects; T. Danby's large picture (116); pictures by E. Duncan (142), E. A. Goodall (150), H. M. Marshall (146); Samuel Read (152), a large picture of wild grandeur and skilful handling; J. Parker (158), George A. Fripp (159), E. F. Brewtnall (169), Tom Lloyd (178), as instances of the work to be seen on the walls. Basil Bradley sends a large, finely-handled landscape, a harvesting scene, "Found Again!" and Tom Lloyd another pastoral scene, "Harvest Moon," a stubble field under a bright moon, both aërial in colour, that would do credit to any gallery. W. Collingwood's "Mountain Glory" (181), representing the spectre of the Brocken, is clever in the rendering of the illusion and mist-veiled landscape of the Harz mountains. Wilmot Pilsbury, the new associate, contributes no less than seven drawings, all remarkable for breadth and precision of colouring and finished execution. The "Stackyard" (141), the "Old Shed" (190), are among the best productions in the gallery. On the second screen, "Buttercups" is a bright, charming little landscape, fresh in colour and truthful; "Wagon and Ricks" (218) and "May Blossom" (256), are also well-finished studies, transparent in colour and crisp in the foliage. G. du Maurier's "Twins" (238) and "A Picture-Book" on the screens will also find admirers of the smaller *genre* subjects. George Fripp's "Shiplake Mill" and "Harvest Scene" (211), are both pleasing sketches of rural subjects.

The new and interesting exhibition of etchings just opened at the Hanover Gallery, 47, New Bond-street, is a proof of the growing taste for this class of pictorial reproduction. The responses which have been made to the committee's invitation include the works of some of our leading painters and etchers, among them O. Bacher, F. Duveneck, H. Herkomer, A.R.A., Otto Weber, H. W. Batley, C. Wilberg, C. W. Sherborne, C. O. Murray, R. Chattock, H. Farrer, S. Parrish, E. Montenore, A. H. Haig, L. L'Hermitte, C. F. Watson, W. Scott, W. Niven, G. F. Watts, R.A., F. Buhot, R. Redgrave, R A., Ernest George, F. Slocombe, A. Le Gros, Seymour Haden, J. Tissot, Meyer, &c. Of course many of the works are copies of subjects already well known to the art-world. We have not the beauty of their colour, but we see the artist abstracting in a few forcible lines the spirit of the originals. In this collection, perhaps, the work of F. Seymour Haden will most be admired for sharpness of touch, light, and shade. "The Willows" (329), "Wareham Bridge" (331), of which there are thirty-five impressions, are inimitable as expressions in a few lines of the etching-needle. The very kernel of the picture, so to speak, is brought out in a few dark and decided touches, and the light and shade is perfect. In J. Tissot's work there is more finish, and in Ernest George's picturesque bit of street architecture much spirit and feeling. The etchings of Manchester and S. Barnada, Venice (5 and 6) are, in their way, perfect poems of light and shade. O. Bacher is a large contributor. His Venetian views of canal and streets, Nos. 9, 13, 14, 15, are remarkably soft and crayon-like, yet full of colour and vigorous play of light and shadow. F. Duveneck shows a few feeling works. "The Riva, looking towards the Ducal Palace" (28) is a fine piece of chiaroscuro, and the portraits of himself and mother, by H. Herkomer, A.R.A., are works of high art. H. W. Batley's series of designs intended as illustrations for a work on furniture are wanting in repose; there is a restless look in one of the designs, but the execution is creditable. We cannot pass by C. Wilberg's deeply-shaded street scene at Bamberg (44) without a word of praise, as a solid piece of effective etching; nor the graphic picture etched by C. W. Sherborne, "Entrance to Westminster School" (50), in which the solidly-shaded archway forms a setting to the picture beyond. C. O. Murray is a master of the etcher's needle; "A Dog's Life of It," and "Left Lonely" (53 and 54), are both pathetic and powerful works. We find an interesting architectural subject in A. H. Haig's "Interior of an old Swedish church" (1st state), showing a pulpit of Renaissance design. L. L'Hermitte, well known for his forcible market and French street scenes, and for a powerful effect of shade and grouping, sends three copies of pictures which have been represented in other galleries, "La Boucherie," "L'Epicerie" (96 and 95), are exceedingly striking etchings of those works. C. J. Watson is a truthful delineator of street architecture. We remark his clever and rather sharp perspective of "London Bridge" as a pleasing study of intense light and shadow, and "Drury-court, Strand." "St. Cuthbert's Screen, St. Alban's," "Wallingford's screen," by Kent Thomas, are feelingly executed in the detail; and the Bridge (112), by W. Scott, is a fine piece of colour. W. Niven exhibits a picturesque etching of Wysley Grove, Cannock Chase, a picturesque old house of Jacobean character; and the "Porch at Ingestre," a work of Renaissance architecture.

Works by Colvin Hunter, R. W. Macbeth, F. Buhot, will be found on the walls. The first-named artist has some clever studies. We also notice Nos. 131, 135, 136, 138, 139, etchings of well-known pictures. G. F. Watts, R.A., has a clever portrait of A. Legros; and Nos. 146 and 151, French incidents, told by so talented and semi-humorous a French delineator as F. Buhot, possess sufficient interest to enlist attention. "Débarquement en Angleterre" (1st state) is a very cleverly-drawn incident, told with graphic power by the artist, who is a thorough master of black and white effects. The few strokes which express the figures are one of the characteristic marks of these works. R. Redgrave, R.A., is the exhibitor of "A Sylvan Scene" (162), and Ernest George's

etchings, "Windmill, Amsterdam," "On the Mai, Dieppe," "Lyme Regis, Dorset," and Houses at Strasbourg are all admirable, full of playful light and shadow and well-drawn detail.

We may equally call attention to the pictorial and masterly work of F. Slocombe in 222, 231; and that of A. H. Haig (250 and 251), "The Quiet Home," and "The Vesper Bell". Those who prefer pictures of incident will find many of J. Tissot's reproductions remarkable for their brilliant finish and soft handling of light and shade. His "Portico of National Gallery," "Croquet," "Seaside," "Emigrants," are masterly productions too well known by original pictures to need description. Heywood Hardy's drypoint and other etchings of wild animals, will also be admired, for their careful drawing and vigorous handling.

Mrs. Butler, better known by her maiden name of E. Thompson, has lately finished another of those marvellous studies of horses which have made her name conspicuous. In her picture, "Scotland for Ever," now exhibiting at the Egyptian Hall, the artist has achieved another triumph of her skill in this particular branch. The scene depicted represents the "Charge of the Greys at Waterloo," a whole troop of splendid horses advancing towards the enemy. The incident recorded is founded on the passage—"As the regiment broke into the charge, the men raised the cry of 'Scotland for Ever!' which was taken up by the Highlanders, who followed the Greys into action." The Highlanders are seen in the rear of the charge, as a dense crowd of horses and riders; but the marvel of the painting is centered in the front rank of horses, and especially in the perpectives of the animals and their expression of desperation as they dash forward heedless of destruction. In the centre is a horse in advance, on one side is seen a rider who is falling from the back of his steed; while the animal's head and the expression of his impetuous eyes are wonderfully painted. The picture is, indeed, one of heroism, and will add to the reputation of its painter.

THE BUILDING EXHIBITION AT ISLINGTON.

(SECOND NOTICE.)

MATERIALS used in building, mechanical appliances, and sanitary improvements form important exhibits at the Agricultural Hall. Messrs. Eastwood and Co., of Wellington Wharf, Belvedere-road, Lambeth, have one of the largest stands (No. 93) appropriated to their cement and brick manufactures. The exhibits are numerous—not as in some cases a few picked specimens of each article, but in sufficient quantity to judge of their merits. Allen's red and white Suffolk facing bricks, white and ornamental glazed bricks, Broseley tiles, firebricks of all varieties, Dutch adamantine clinkers, blue Staffordshire bricks, red and blue cresting and ridge tiles, hip knobs, finials, chimney caps, make up the leading items in the very excellent display of clay wares brought together. We were struck chiefly with the quality of these goods—the excellent glazed surfaces, the hard, well-modelled ornaments and finials, and the chequered pavings in blue Staffordshire. The specimens shown of Shoebury and Kent bricks, especially the malm facings and paviors, and Suffolk rubbers are equal to the best in the market, and the Broseley roofing and ridge-tiles leave little to be desired in hardness or colour. Messrs. Eastwood and Co. also show some capital specimens of terra-cotta in ornaments, chimney caps, and their well-known Portland cement (Wellington brand), which is manufactured from Medway earth. Sanitary ware in every variety is another speciality. Passing from clay materials to stone, we find a few exhibitors who show what quarries are available for the architect's purposes, and certainly to the student and young architect, these collections of worked sandstones and limestones possess an educational value. Messrs. W. and J. R. Freeman and Co., of Millbank-street (132), furnish specimens of their granites, marbles, and other stones; many of these are of very hard and durable qualities and pleasing colours. The Carnsew granite drinking-fountains are of sensible design, boldly executed, and well adapted for public and street purposes. The granite drinking-trough shows a very suitable kind of receptacle for cattle, and this form has been executed for the Metropolitan Drinking Fountain Association. Another pleasing form of fountain in Portland stone, relieved by bands and vousssoirs of red Dumfries stone and grey granite basin, designed in a Moorish style, the basin being recessed in a niche, is also in the collection, from a design by Messrs. Paull and Bonella. We remark a Cornish granite church-font of simple design, specimens of the Beer freestone worked to a moulding, of the Newbiggen stone, a warm, reddish material of promise, and other examples of dressed and finished materials. Last week we just mentioned the specimens of concrete shown by the "Eureka Concrete Company," of Queen Victoria-street. We may here more particularly draw attention to the advantages of this material for staircases, landings, pavements, and floors. For these purposes the ordinary method is to mould the article first, but the "Eureka concrete" can be made on the spot, and the paving or landing laid to suit the requirements of the case. It very quickly sets, and soon becomes hard enough to bear the roughest traffic. As regards cost, it is considerably cheaper than York or Portland stone, and its durability is unquestionable. A specimen of the Eureka concrete paving may be seen in Oxford-street, at the corner of Old Cavendish-street, laid by the inventor, Mr. Nichols, referred to by us in the BUILDING NEWS of October 1, 1880. This concrete, we may add, is composed of specially prepared materials, and will stand heat. For window-lintels, sills, mullions, and cornices, as well as for stable and warehouse and fireproof floors, it cannot be surpassed. The specimens exhibited at the show indicate the large field of uses for which this material can be employed. The steps with round nosings, and the railway platform slab show clearly the economy that might be effected if architects for public buildings specified such a kind of concrete, and what a saving railway companies would effect if they laid their new platforms and staircases with this material, instead of the constantly-decaying planks and unevenly-wearing York stone. Mr. Thomas Lawrence, brick and tile manufacturer, Bracknell, Berks, is a contributor of some good red facing-bricks, rubbers, and cutters. In colour and quality the specimens are unsurpassed. The latter are shown in three kinds of red—an orange, a bright cherry red, and a deeper shade of red—and will be found well adapted for the cut and rubbed work of Queen Anne details. The model pedestals showing these shades of red are worth attention, as samples of gauged and carved brickwork, and the fine qualities of the clays. Samples of tile roofing of different shades, gabled tile-work, and moulded bricks are also seen at this stall. We may mention, as one of the best recommendations of these bricks, that Westwood House, Sydenham, illustrated in these pages some time since, a large Renaissance building, has been executed in the red bricks of this manufacture.

Mr. S. Trickett, Millwall, E., has a varied assortment of building-stones, some in a rough state, others dressed and polished. The column or shaft of red Corsehill stone, is a splendid example of the fine-veined appearance of this close-grained sandstone. From actual buildings executed in London, such as the Hand-in-Hand Insurance Office, Blackfriars, St. James's Hall, the Gresham, Bucklersbury, &c., there is little doubt of the good weather quality of well-selected and laid Corsehill stone. It works easily, and is thus well adapted for carved work, columns, and ashlaring; but its value, as affording a warm contrast of colour with greyer varieties of material, must make it a highly decorative stone, both for external and internal purposes, and a formidable competitor of Mansfield. The density and texture are much in its favour, and the analysis given of it shows it to be composed mainly of silica and cementing elements. Architects will find Mr. Trickett's collection a highly interesting one.

Among the numerous exhibitors of patented material, the large stall of Lipscombe and Co., of Temple Bar, and 69, Oxford-street, is worth attention for the numerous specimens of their patent glazed architectural blocks, as used in the front of the Oxford-street premises. The advantages claimed by this firm are that the material is as hard and imperishable as granite, and is cleansed by every shower of rain. The dormer window exhibited is of a pleasing warm cream colour. There are also various specimens of keystone, moulded heads, bas-reliefs, garden statuary and vases, some of the designs for which, however, we do not like at all. Mr. George Mitchell, of Upper Thames-street, contributes several carved statuary marble, brocatella, black marble, and rouge Griotte chimney-pieces, but we more particularly notice the superior groundwork and finish of his scagliola pedestals, and the red Devon marble-shaft.

At stands 229 and 230 Messrs. Craven, Dunnill, and Co. (Limited), of Jackfield Works, Ironbridge, Shropshire, exhibit three patterns of glazed tile dados, which are both useful and ornamental. In addition to their pleasing appearance, they keep clean with little trouble, and the colours are bright, and for dado purposes these kind of tiles will always commend themselves. A variety of patterns for hearths, in encaustic tiles (Nos. 357 and 358), are noticeable for the arrangement of colour, and in enamel and incised tiles there are some choice examples; splays for fireplaces of hand-painted tiles are shown, and we noticed a splay in embossed and enamelled tiles of rich colours. The embossed tiles are, we understand, taken from bronzes in a Shintu temple, and the curious may note not only some interesting specimens of Japanese work, but may trace out in the ornaments Japanese cosmogony. A slab of ceramic mosaic has a tempting appearance for hall pavements, and it is claimed for this mosaic that it is far harder and more durable than marble, and that superior effects can be obtained in ceramics.

A very large display of enamelled slate and marble chimney-pieces, and register stoves with appurtenant fittings, are to be seen at the stall of Messrs. Ford and Margrett, of Camp Hill, Birmingham. Some exquisitely carved and very elaborate specimens of chimney-pieces of the most costly description are to be found. The "Eureka" slow-combustion tile register, with hand-painted tile patterns and black marble fender curb and tile hearth, would transform any room into one of cheerfulness and comfort. Other slow-combustion registers, with tiled sides, are exhibited. We observe colours and decorative accessories to please almost any taste, from Queen Anne to the admirers of buhl and rococo. For a varied assortment of kitcheners, tile stoves, marble mantel-pieces, hot-air stoves, &c., the col-

lection of Messrs. Yates, Haywood and Co., of Upper Thames-street, will be found interesting. This department of the exhibition is certainly the largest, but the goods of the firm we are noticing are of superior manufacture and finish to many other exhibits of the same kind to be met with in the hall. The Queen Anne stoves and the tile stoves will repay attention, for neatness and good workmanship.

Messrs. Steven Bros. and Co., of Upper Thames-street, occupy a very conspicuous area in the exhibition, and their collection embraces every variety of builders' ironmongery. It would be impossible to do justice here to the numerous samples exhibited. In kitchen-ranges alone there are several creditable specimens of workmanship and fitting, with recent improvements. The ash-pits are lined, so that brickwork and setting are largely saved, and the manufacturers show a very effectual means of ventilating kitcheners, by which all fumes are carried up the flue. We also notice a clever smoke-consuming door to some ranges. Baths and furniture are various, and we certainly think the dado border decoration round the backs, specimens of which are on view, an excellent kind of relief, as it may be made to harmonise with the dado of the bath-room. The patent baths of this firm of cast iron, enamelled, are of very superior kind; the enamelled surface is preferable to porcelain enamel, which cracks and peels off, from unequal contraction. Another speciality is the hooded register stoves, with electro-bronze sides and relief ornamentation in the late English styles; and we remark a handsomely finished range fitted with tiles, skirting, and electro mountings, perfect in its workmanship, and suitable for a mansion, hotel, or club. The collection of hot-water apparatuses, boilers, furnace fittings, and ornamental castings and rain-water goods is very complete and well selected, and we noticed a few well-designed balusters, crestings, and finials.

An important branch of constructive industry is concerned in horticultural building. Mr. Henry Hope, of Birmingham, exhibits a few models of horticultural buildings, in which the framing is of cast iron with rolled iron sashes and copper-glazed bars. Many advantages are no doubt secured by the system adopted in the metallic vinery similar to those erected in the Royal gardens at Frogmore and Osborne. The sills are also of cast iron, and the uprights and panels can be made to suit any dimensions. The sashes of front and roof are opened by shafting and screw gear. The "wind and watertight" casements and frames will also meet with approval from builders. They are of solid rolled iron, fitting into cast-iron frames with planed bearings. There is a drip-lip on the bottom rail for condensed moisture; the casements are hung on gun-metal hinges, and have regulating stay-bar and handle. These casements and frames can be made to any design, and are claimed to be free from the objections made to ordinary workmanship in windy weather. We have mentioned several improvements in shutters. Mr. John Stone (Ulverston) is the exhibitor of a revolving shutter which, for completeness and perfect working, cannot be surpassed. The "Ulverston" shutter is made in wood, iron, and steel, and is fitted with a patent self-acting oil-box, and by the balance-weight motion the shutter drops perpendicularly at every turn, and all dragging, friction, and straining is avoided. The "patent motion" we inspected at the Hall is very simple, and the self-acting lubricator combines all that is wanted to make the revolving shutter perfect in action. Stone's motion avoids also the trouble of winding-gear, and the shutter is balanced in any position. We also notice specimens of lifts and hoists, fitted with a new safety apparatus, which prevents the falling of the cage if the rope breaks.

Brass-work of good design, locks, latches, and other kinds of builders' and cabinet-makers' ironmongery, may be found in the stall of Messrs. Rownson, Drew, and Co., of Upper Thames-street, who also have a large variety of sections of rolled iron joists and girders, and portable forges and hand-fans. We remark a well-executed marble chimney-piece, of green and black marble (St. Anne's), some well-fitting wrought-iron sashes, and a few registers. Mr. H. Sykes, of Bankside, shows a model of an improved friction hoist, of ingenious construction, worth the notice of builders and architects; and Hamilton and Co., of Leadenhall House, have a considerable stall near the entrance, devoted to specimens of their patent prismoidal lens and pavement light, in every variety of make and design. Builders and others may see also models of Hamilton's patent equilibrium and rolling motion, with gutter, a method of fixing movable lights, which has been described by us on former occasions. The samples of tesselated pavements, stall-board, and roof-lights show many new and useful applications of this means of lighting dark places and corners, in obedience to the natural laws of refraction and dispersion of light.

In the machinery department we observe many ingenious modifications in labour-saving and wood-working appliances. Messrs. F. W. Reynolds and Co., of the Acorn Works, Blackfriars-road, who hold a high position in this branch, have a large section (stalls 349 and 350) set apart for the display of their machines. We must particularly draw the attention of builders to their patent concrete mixer for hand and steam-power. It consists of a cylinder, which rotates, movable outlet, and can be tipped to any angle that may be required. It is mounted on wheels. Another useful machine is the "Universal" planing, moulding, and tenoning machine. We also saw a cleverly-fitted panel planing and thicknessing machine capable of planing a panel 18in. wide and 5in. thick. The "deal frame" is a self-contained simple and useful contrivance. The band-saw "Imperial Combination," and other forms of saw-machines are worth notice for the improvements introduced, and the workmanship and fittings of these machines are almost perfect. Messrs. Charles Powis and Co., of Gracechurch-street, are exhibitors of a patent mortising and mitring machine (Harding's patent) well worthy of attention. It is just patented, and our examination of it convinced us of its value for many kinds of work. The mitre and mortise machine can mortise on the bevel and perform other operations, as blind-punching and tenoning. The joiner "Universal," with self-acting feed, and the band sawing-machine, with boring apparatus, adapted for cutting wood into circular, irregular, angular, or other directions, are also noticeable appliances for wood-working. A well-fitted hydraulic working model of a dinner-lift is exhibited by Messrs. Rosser and Russell, of Charing Cross. The model shows an ordinary-sized lift, as fitted between basement and ground-floor, with ram, cylinder, and counterbalance gear. This firm shows also several important improvements for greenhouses. One of the best of these is a system of glazing without putty, which is applicable to existing houses. The wooden bars or rafters are moulded, and lead is dressed round the roll, and at the same time forms clips to take the edges of the glass. A model exhibited shows a lean-to roof thus glazed subjected to a constantly-running stream of water. Condensed-water gutters are formed below the glass in the bars, and the price of sash-bar is moderate—only 6d. per foot, or 1s. 3d. per square foot for the glazed roof. Outside painting is saved. Another improvement is the cutting of the lower edges of the glass panes slightly on the bevel, so that the water is more easily conveyed into the lead grooves which form the clips. The oak and cane coil-case is a pleasing substitute for the elaborate cast-iron coil-cases usually sold. We believe Mr. G. E. Street, R.A., is the purchaser of the case. Among the economical products of this class we may mention an improved "double L" saddle boiler, manufactured by J. Jones and Sons, of Bankside, Southwark, and suitable for warming public and other buildings. Messrs. Jones' boiler presents this advantage, that while in most boilers, the heat is absorbed by the brick setting, this is so constructed that the full amount of heat is saved. An hood-shaped arrangement of flues is fixed over the saddle-boiler, some few inches in the clear, and the flues are made to enter this hood-like cover; thus utilising, we should say, quite double the ordinary heating surface. The boiler is made in wrought-iron. Some capitally fitted kitcheners of the Leamington type, with nickel-plated mountings, are shown, and Messrs. Jones have been engaged in the heating arrangements of one of the largest training-ships at Portsmouth. It is unnecessary to repeat what we have already said with regard to Messrs. Crossley Brothers' (Poultry) well-known and excellent "Otto silent gas-engine," which may be seen at stall No. 304. There is no doubt the "Otto" has taken its place among our most economical motors, and its future universal adoption for all kinds of light work is merely a question of time.

Sanitary apparatus, if not so numerous as we might have expected, show many improvements. Last week we casually referred, in speaking of Messrs. Doulton's sanitary exhibits, to Mr. Bailey Denton's aërated filtration system, and we may now more particularly call attention to the merits of Mr. Denton's new filter. The new system may, in short, be described as the carrying out within the house of Mr. Denton's intermittent filtration. The objections urged against storage of water in house cisterns are removed, as the water used is automatically supplied to the filter, and as the water is drawn an equal quantity is admitted above. Complete aëration follows the percolation of the water through the filtering materials, and all putrescible matter is therefore oxidised. We consider this alternate absorption of air after the water a valuable feature in this filter. The mechanical parts are few and simple. There is below the filter a receptacle or tank for the filtered water, which can be made of slate of any size to meet the demands. For country-houses, where stored rain-water is used, and for schools and other public buildings, we believe this filter promises to supersede the common house-cistern with its many objectionable features. The price for a small filter with fittings, to filter 25 gallons per hour, is only 40s. These are made to any size, by Messrs. Doulton and Co., of Lambeth. Messrs. Capper, Son, and Co., of Fenchurch-street, have a display of Pearson's trapless twin-basin water-closets made in whole pieces of white earthenware. Those shown in operation are noticeable for simplicity of action, cleanliness, and security against foul air. There are no wires and no cranks, no container, but the apparatus is thoroughly self-cleansing. The Brian Jones' patent joint for connecting the closet to the soil-pipe is another effectual security against gas-escape, and a much more durable joint than putty. Messrs. Braithwaite and Co., of Leeds, show their patent siphon cistern in action. It is a capital and economical flushing apparatus, and too simple to get out of order. Mr. J. E. Ellison, of Leeds, also has illustrated models of his conical ventilators, which admit fresh air without draught. The conical perforated bricks and skirtings are shown by specimens; and the

latest invention we saw is an "air-diffuser," which by conical apertures arranged round the periphery of a circular disc, which slightly projects from the wall at any height, diffuses the fresh air so equally that no draught can be felt. The diffuser may be decorated in front by painted devices, or serve the purpose of a mirror. The value of the cone-shaped aperture is fully demonstrated by the little model exhibited on the table. Mr. E. G. Banner, so well known for his sanitary inventions, exhibits, besides his ventilating cowl and trap, already familiar to our readers, an improved closet apparatus, the principal object of which is to obviate the evils of the offensive deposit or incrustation to which many closets are liable. The container, which also forms part of the inner basin, is made in one piece, with a flushing rim round the upper edge. An inner basin fits in a groove to the outside container forming a water-joint, and its lower aperture, 8in. diameter, has a large valve provided with a "slip-catch" joint, which enables it to be taken out easily. By the large aperture and valve solid matter readily falls into the lower basin or container filled with water. The valve is actuated by a handle and levers, a well-regulated supply of water is insured, and the inventor has devised an efficient mode of ventilation from the outer basin below the water seal.

The Builders' and Manufacturers' Exchange and Subscription Rooms, of 205-6, High Holborn, are not unrepresented, for visitors may obtain full particulars and prospectuses of the new scheme. Our recent remarks on the advantages of a central and permanent establishment for the exhibition of materials and appliances, make it unnecessary to say more than that the building trades required such a public means of introducing their inventions and their business to the notice of the architect and the public. The Banner system of sanitation has been applied to the premises in Holborn, and the drawings exhibited at the stall fully explain it. Messrs. Engert and Rolfe, of Poplar, exhibit a model, demonstrating the impermeable nature of their fibrous asphalte for damp-courses. A brick wall, set in a cistern of water, is shown to prove the watertight quality of the asphalte course. We see also specimens of this firm's excellent asphalted roofing-felt for coverings, and hair-felt for lining roofs. Mr. A. C. Engert's apparatus for preventing echo and transmitting sound has been applied in the chemical lecture-theatre at South Kensington, and is found to remedy the acoustic defects. We may also notice Messrs. Braithwaite's trap, "Claughton's patent," as very simple, made of pure pig lead cast in one piece; unlikely to siphon out, and the water-seal is almost perfect. F. Leroy and Co.'s (Gray-street, Commercial-road) have specimens of pipe covered with a "non-conducting composition," which prevents bursting of pipes by frost and retains heat. The method of applying the composition is clearly shown by the specimens, and we hope Messrs. Leroy's composition will be more generally applied to our water-pipes before the approach of another severe winter.

Altogether, the Building Exhibition is a success. Another year we should like to see everything in better order on the opening days of the show. Beyond this drawback, there is little to complain of, except the absence of several leading firms whom we expected to have seen represented. We may just remind workmen connected with the Building Trade that the exhibition remains open over Easter Monday and Easter Tuesday, and that an hour or two on either holiday may be profitably spent at Islington by those whom bad weather, or other causes, may hinder from venturing farther afield.

STRENGTH OF BEAMS.

WHEN an architect desires to ascertain the amount of load he can safely place upon a beam which he is about to use in a building, he is generally satisfied with the information supplied to him through some formula for breaking-weight, which he finds ready to his hand in a "handbook," or other work on the subject of the strength of materials. Should he, however, be possessed of more than one such work, and should he try the formulæ given by each of them, he will probably find that there is a considerable discrepancy in the results which he obtains. This often arises from a want of consideration of the principles upon which any particular formula are based. Thus, for example, if the strength of a cast-iron girder is required, he will probably use the Hodgkinson formula

$$W = 2G \frac{A \cdot d}{l}$$

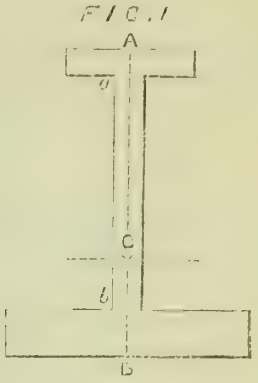
where A is the area of section of the bottom flange at the middle, d the depth of the beam, l its length, all in inches, and W the breaking-weight at the middle in tons. Now this formula is only approximately correct when the bottom flange contains more than half the whole of the metal in the girder; and it entirely ignores the strength derived from the metal in the top flange and web. If, therefore, the architect should apply this formula to the case of a beam in which the lower flange contains less than half the metal of the beam, he will find himself very much misled by the result he obtains.

Since the security of a building depends very much on a proper amount of strength being given to every part, it becomes desirable that the strength of important beams should be properly calculated from first principles, and that too great reliance upon formulæ should be avoided. We therefore propose to show how this may be readily done in the case of any beam either with or without flanges.

When a beam is subjected to a strain by a load placed in the middle, it is evident that the lower part has to resist a tensile or stretching force, while the upper part encounters a compressing force. There must, therefore, be some point in the transverse section of the beam where there is neither compression nor extension going on, and this point is situated in what is called the neutral axis of the section. Now, since all our moments of resistance of the particles have to be taken about this axis, it becomes our first consideration to determine its exact position. Formerly this was considered a rather troublesome problem to solve; but the difficulty has been very much lessened from its having been ascertained, by carefully conducted experiments, that when a beam is not strained beyond the limits of safety, the neutral axis passes through the centre of gravity of the section, whatever may be the nature of the material of which the beam consists, or the relations existing between the ultimate resistance to compression, and the ultimate resistance to extension. Now, since it happens that for all practical purposes we only want to know how much load a beam will bear with safety, we shall not be far wrong if we take the centre of gravity of the transverse section as the point about which to measure our moments of force.

Let Fig. 1 represent the transverse section at the middle of a beam having top and bottom flanges connected by a vertical portion or web; the line A B being the central vertical axis, and G the centre of gravity of the section, the position of which is determined in the manner described in a previous article on "Centre of Gravity" (see the Building News, page 285). Now suppose f to represent the resistance of the fibres or particles per square inch of section to the forces of extension or compression at the distance of 1in. from G; then, since the strain on any particle increases in proportion to its distance from G, we have $f \times x$ repre-

FIG. 1.



senting the resistance per square inch at any distance of x from G; and $f \times GA$ is the resistance per square inch at the top of the beam, $f \times GB$ being that at the bottom of the beam.

Let us now take any small elementary portion of the section whose depth we call δx and its breadth y, at a distance x from G, so that its area is $y \times \delta x$; then the moment of the force of resistance of this element about G is

$$f \cdot y \cdot x^2 \cdot \delta x$$

And since the whole resistance of the fibres of the beam above or below G is the *sum* or "integral" of the resistances of each elementary portion, we have (putting for δx the differential dx) the moment of resistance about G of any part of the beam measured from G to a distance x from G, represented by the expression

$$f \cdot y \int x^2 \cdot dx$$
$$= f \cdot y \frac{x^3}{3}$$

the integration being taken between the proper limits for each part. These limits are for the top flange whose breadth is p, from $x = Ga$ to $x = GA$; so that the moment of the upper flange (putting $y = p$) is

$$f \cdot \frac{p}{3} (GA^3 - Ga^3) \ldots\ldots\ldots \quad (P)$$

For the bottom flange, whose breadth is q, the limits of integration are from $x = Gb$ to $x = GB$; and the moment of resistance (putting $y = q$) of the lower flange is

$$f \cdot \frac{q}{3} (GB^3 - Gb^3) \ldots\ldots\ldots \quad (Q)$$

Let t be the thickness of the web, or $y = t$, then the integration for the part above G is from $x = 0$ to $x = Ga$, so that the moment of the forces of the upper part of the web is

$$f \cdot \frac{t}{3} (Ga)^3$$

And for the lower part of the web the integration is from $x = 0$ to $x = Gb$, so that the moment for the part Gb is

$$f \cdot \frac{t}{3} (Gb)^3$$

Hence we have the moment of resistance of the whole web given by the expression

$$f \cdot \frac{t}{3} (Ga^3 + Gb^3) \ldots\ldots\ldots \quad (T)$$

Now when a beam is strained by a load W, placed on the middle, the length of the beam being called l, we have, by the laws of mechanics, the moment of the strain at the centre

$$= \tfrac{1}{4} W \cdot l$$

which must be equal to the sum of all the moments of resistance exerted by the fibres or particles of the beam. If, then, we call $M \cdot f$ the sum of all the quantities (P), (Q), and (T), we have to determine W from the equation

$$\tfrac{1}{4} W \cdot l = M \cdot f$$

The value of the quantity f depends upon the nature of the material of which the beam

is composed, and has to be found experimentally for each particular case. For $f \times GA$ or $f \times GB$, being the maximum strains to which any of the fibres are subjected, must be fixed before we can determine the value of f. Thus, in cast iron, we find that 2 tons per square inch is considered as the limit of safety, or working load, for the part subjected to extension; and since this is the condition of the part below G, we have to put—

$$f \times GB = 2, \text{ or } f = \frac{2}{GB}$$

And as it is also ascertained that 10 tons per square inch is the working load for the part subjected to compression, namely, the part above G, we also have—

$$f \times GA = 10, \text{ or } f = \frac{10}{GA}$$

As, however, it is a well-known rule that the strength of a beam is only that of its weakest part, we must use whichever value of f is lowest in these two equations, otherwise we should be liable to overstrain one or other flange of the beam.

We will now take as an illustration of the ready application of our equations, the case of a double-flanged girder, 20ft. long, the position of whose centre of gravity is given as an example in the article before referred to on "Centre of Gravity." Here we have—

$$p = 5,\ q = 10,\ t = 1,\ Ga = \frac{107}{14},\ Gb = \frac{33}{14},$$
$$GA = \frac{121}{14},\ GB = \frac{61}{14},\ l = 240.$$

Then the several expressions (P), (Q), and (T), become as follows—

$$(P) \ldots f \cdot \frac{5}{3} \cdot \frac{121^3 - 107^3}{14^3} = f \times 332$$
$$(Q) \ldots f \cdot \frac{10}{3} \cdot \frac{61^3 - 33^3}{14^3} = f \times 232$$
$$(T) \ldots f \cdot \frac{1}{3} \cdot \frac{33^3 + 107^3}{14^3} = f \times 153$$

Adding all the quantities together, we find—

$$M \cdot f = f \times 717$$

also—

$$\tfrac{1}{4} W \cdot l = W \times 60$$
$$\therefore W = f \frac{717}{60}$$
$$= f \times 11{\cdot}95 \quad \ldots\ldots\ldots (A)$$

Example 1.—Suppose the above-mentioned beam to be made of cast iron, in which 2 tons per square inch of section is the maximum working load of the part subjected to tension, and 10 tons per inch of that under compression, then we have—

$$f \times GA = 10, \text{ or } f = \frac{140}{121}$$
$$f \times GB = 2, \text{ or } f = \frac{28}{61}$$

Taking the lower of these two values of f, namely—

$$f = \frac{28}{61}$$

we obtain from the equation (A)—

$$W = \frac{28}{61} \times 11{\cdot}95 = 5{\cdot}485 \text{ tons}$$

as the working load on the middle of the girder.

In this example the area of the bottom flange is more than half that of the whole section; so that we may apply to it the Hodgkinson formula above alluded to, namely—

$$W = 26 \frac{A \cdot d}{l}$$
$$= 26 \frac{20 \times 13}{240} = 28{\cdot}17 \text{ tons}$$

which is the *breaking-weight* of the beam, and is about five times the *safe load*, as calculated above.

Example 2.—Let the same beam be of rolled iron in one piece of metal, for which the maximum safe load for the parts in extension is usually taken at 5 tons per square inch of section, and for those in compression at 4 tons per inch. Then, in this case, we have—

$$f \times GA = 4, \text{ or } f = \frac{56}{121}$$

and

$$f \times GB = 5, \text{ or } f = \frac{70}{61}$$

The former value of f being the smaller one, we must put that into our formula (A), which gives

$$W = \frac{56}{121} \times 11{\cdot}95 = 5\ 53 \text{ tons}$$

which is the safe load at the middle of the beam.

If we reserve the beam, and place the larger flange at the top, we shall then have

$$f \times GA = 5, \text{ or } f = \frac{70}{121}$$

and

$$f \times GB = 4, \text{ or } f = \frac{56}{61}$$

Taking the former as the smaller value of f, we obtain

$$W = \frac{70}{121} \times 11{\cdot}95 = 6{\cdot}913 \text{ tons}$$

as the safe load at the middle; so that we gain nearly $1\frac{1}{2}$ tons in strength by altering the position.

Example 3.—Now let the material of the same beam be steel, in which 10 tons per square inch is the maximum working load for either compression or extension. Here we have

$$f \times GA = 10; \text{ or } f = \frac{140}{121}$$

and

$$f \times GB = 10; \text{ or } f = \frac{140}{61}$$

The former being the lesser value of f, we substitute it for f in the equation (A), and obtain

$$W = \frac{140}{121} \times 11\ 95 = 13{\cdot}826 \text{ tons}$$

for the safe load at the centre of the girder.

We will now for the sake of comparison apply our formulæ to a beam of the same depth, length, and area of section as the above, but in which the top and bottom flanges are of equal areas, their distance apart or the size of the web being unaltered. The point G will now be at the middle of the web, or $6\frac{1}{2}$in. from top and bottom of the beam; the area of each flange will be $\frac{25}{2}$ and its thickness $\frac{3}{2}$, the values of p or q will therefore be $\frac{25}{3}$. We also have

$$GA = GB = \frac{13}{2},\ Ga = Gb = 5$$

Therefore, the value of (P) is

$$f \frac{25}{9} \left(\frac{13^3}{8} - 5^3\right) = f \times 415{\cdot}625$$

which is also the value of (Q). And the expression (T) becomes

$$f \frac{2 \times 5^3}{3} = f \times 83{\cdot}333$$

The equation $\frac{1}{4} W \cdot l = M \cdot f$ therefore becomes

$$W = f \frac{831{\cdot}25 + 83\ 33}{60}$$
$$= f \times 15{\cdot}243 \quad \ldots\ldots\ldots (B)$$

which we will now employ to determine the strength of the beam in cast-iron, rolled-iron, and steel respectively. For cast-iron we have $f \times \frac{13}{2} = 2$, or $f = \frac{4}{13}$, from which we get for the value of equation (B)

$$W = \frac{4}{13} \times 15{\cdot}243 = 4{\cdot}69 \text{ tons}$$

as the safe load at the middle of the beam. Comparing this result with that obtained from equation (A) with the lower flange larger than the upper, we see a falling off of nearly $\frac{4}{5}$ tons in the strength, although the same quantity of metal is used in the two beams.

For rolled iron we have

$$f \times \frac{13}{2} = 4, \text{ or } f = \frac{8}{13}$$

and the equation (B) becomes

$$W = \frac{8}{13} \times 15{\cdot}243 = 9{\cdot}38 \text{ tons}$$

for the safe load at the middle. Comparing this with the results obtained in the former case from equation (A), which gave 5·53 tons and 6 913 tons, we see that there is a great increase of strength by altering the form of beam, and that in using wrought-iron the two flanges should be as nearly as possible of equal size.

In a steel beam we have

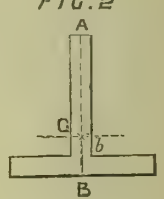
$$f \times \frac{13}{2} = 10, \text{ or } f = \frac{20}{13}$$
$$W = \frac{20}{13} \times 15{\cdot}243 = 23{\cdot}45 \text{ tons}$$

as the safe load at the middle of the beam. Here again we find a great increase in the strength of the beam, as compared with that of the former one, which was only 13·826 tons.

The advantages derived from the employment of the above method of calculating the strength of beams, instead of merely applying formulæ made ready to hand, is very considerable; as we can tell to a nicety the amount of strain which every part of the section is subjected to by a given load, and are thereby enabled to economise material by giving a proper form to the beam, according to the nature of the material we employ. While, on the other hand, in making use of fixed formulæ we are often working in the dark, as it is quite a chance whether the particular one we employ is adapted or not to the form of beam to which we apply it.

The above statement may also be clearly demonstrated by applying our method to the calculation of the strength of a joist of "T-iron," as shown in Fig. 2. Taking as

FIG. 2



an example the section of which the centre of gravity G is given in the before-mentioned article on "Centre of Gravity," in which Ab the web is 5in. by $\frac{3}{4}$in., and the flange 6in. by 1in., we have—

$$GA = \frac{113}{26} = 4{\cdot}346,\ GB = \frac{43}{26} = 1{\cdot}654,\ Gb = {\cdot}654;$$
let $l = 120$in.

Then we have for the formula (Q)—

$$f \frac{6}{3} (1{\cdot}654^3 - {\cdot}654^3) = f \times 8{\cdot}4906$$

and for the formula (T)—

$$f \frac{3}{12} (4{\cdot}346^3 + {\cdot}654^3) = f \times 20{\cdot}5914$$

The equation $\frac{1}{4} W \cdot l = M \cdot f$, becomes therefore—

$$W = f \frac{29{\cdot}082}{30}$$

We have also—

$$f \times GA = 4, \text{ or } f = \frac{104}{113}, \text{ and } f \times GB = 5,$$
$$\text{or } f = \frac{130}{43}$$

and taking the lesser value of f, we obtain—

$$W = \frac{26{\cdot}765}{30} = {\cdot}8922 \text{ ton.}$$

as the safe load at the middle of the beam.

If we reverse the beam and have the flange at the top, we get—

$$f \times GA = 5, \text{ or } f = \frac{130}{113}; \text{ and } f \times GB = 4, \text{ or } f = \frac{104}{43}$$

and taking the smaller value of f, we find—

$$W = \frac{33{\cdot}456}{30} = 1{\cdot}1152 \text{ ton}$$

as the safe load at the middle.

We will now compare this with the strength of a beam containing the same amount of metal, but having a flange 6in. by ½in. at top and bottom, the total depth remaining the same. In which case—

$$GA = GB = 3; Ga = Gb = \frac{5}{2};$$

and the formula for the two flanges becomes—

$$2f\frac{6}{3}\left(3^3 - \frac{5^3}{8}\right) = f \cdot \frac{728}{16}$$

and for the web—

$$f\frac{3}{12}\left(\frac{5^3 + 5^3}{8}\right) = f \cdot \frac{125}{16}$$

Also—

$$f \times GA = 4, \text{ gives } f = \frac{4}{3}$$

therefore we have—

$$W \times 30 = f \cdot \frac{728 + 125}{16} = 71$$

$$\text{or } W = \frac{71}{30} = 2.37 \text{ tons}$$

which is the safe load at the centre, and is more than double that obtained in the "T" form of beam.

The same method can also be readily applied to beams of wood whose section is rectangular, the centre of gravity and neutral axis being at the middle of the section. In this case, there being no flanges, we have only to calculate the moment of resistance from the formula (T), and putting d for the depth and t for the breadth of the section, we have the equation—

$$\tfrac{1}{4}W \cdot l = \tfrac{2}{3}f \cdot t\left(\frac{d}{2}\right)^3$$

In beams of fir or oak it is usual to take the maximum working strain as 1 ton per square inch for extension, and ½ ton for compression; hence, according to our rule, we put—

$$f \times \frac{d}{2} = \tfrac{1}{2}, \text{ or } f = \frac{1}{d}$$

For example, let the beam be 12in. deep by 6in. wide, and 20ft. or 240in. long; then f = 1-12, and from the above equation we get

$$W = f \times 14{\cdot}4 = \frac{14{\cdot}4}{12} = 1{\cdot}2 \text{ ton}$$

as the safe load at the centre of the beam.

When teak is used for the material of a beam, the maximum working strain is taken as 1 ton per square inch, either for extension or compression; and we have, therefore,

$$f \times \frac{d}{2} = 1, \text{ or } f = \frac{2}{d} = 1\text{-}6; \text{ and consequently}$$

$$W = \frac{14{\cdot}4}{6} = 2{\cdot}4 \text{ tons}$$

for the safe load on the middle.

In applying this method to the calculation of beams, it must be borne in mind that the value given to the constant $f \times GA$ or $f \times GB$ is quite arbitrary; some specimens of iron, steel, and wood being much stronger than others; so that in each particular case we must judge for our ourselves what is the maximum amount of strain per square inch that may with safety be applied to the material.

ACTUAL LATERAL PRESSURE OF EARTHWORK.

At the meeting on Tuesday, the 5th of April, of the Institution of Civil Engineers, the paper read was on "The Actual Lateral Pressure of Earthwork," by Mr. B. Baker, M.Inst. C.E.

The author dealt with the actual lateral pressure of earthwork, as distinguished from the "text-book" pressures, which, as Professor Barlow pointed out half-a-century ago, were based upon theoretical calculations that disregarded the most vital elements existent in fact. The question affected the stability of retaining walls, the strength of tunnel linings, the timbering of shafts, headings, tunnels, deep trenches for sewers, and many other works of every-day practice. Attention was directed to the measurements by Lieut. Hope, R.E., of the direct thrust of sand on a pressure-board, which was found to be equivalent to that of a fluid weighing 19lb. per cubic foot, and to the experimental brick retaining walls tested by the same officer, when pressures of half that intensity were recorded, and these actual pressures were compared with the corresponding theoretical pressures, of 27lb and 23lb per cubic foot. General Pasley's and General Cunninghame's model revetment walls were then referred to, and General Burgoyne's experimental masonry walls, 20ft. in height; Colonel Michon's 40ft. wall, averaging hardly more than 1-12th of its height in thickness, and Mr. Constable's "toy" retaining walls of wooden blocks with pease for earthwork, indicated no less than the previously cited experiments that the actual measured lateral pressure of good filling hardly ever exceeded one-half of the "text-book" pressure corresponding to the given slope of repose.

The author's experiments on the direct lateral pressure of ballast and large stones were next summarised, the results being in general considerably lower than those obtained by Lieut. Hope. His experience on the 34 miles of deep timbered trenches and other works of the underground railway, also furnished many examples of the actual pressure on timber-walings, tunnel-headings, retaining-walls and vaults. Exceptionally light works standing perfectly, and apparently very heavy works which had failed, alike served to prove that the designing of retaining walls was in most instances more a matter for judgment and experience than for calculation. Thus one of the walls on the Metropolitan Railway, which should have failed with a fluid pressure of 19lb. per cubic foot, had stood perfectly, whilst another wall capable of resisting 107lb. had occasioned much trouble. During the construction of the line, the wall on the west side of the Farringdon-street station failed bodily, by slipping out at the toe and falling backwards on to the slope of the earthwork. This wall was 29ft. 3in. high above the footings and 8ft. 6in. thick, and the soil consisted of 17ft. of made ground, 3ft. of loamy gravel and 9ft. of clay. On the opposite side of the station the ground was retained by vaults, 29ft. high by 17ft. deep, but these also slid forward and came over at the top, the movement continuing even after the work had been doubled in thickness. The softening and lubricating action of water on clay was the proximate cause of these failures, as otherwise the latter vaults would have resisted a fluid pressure of 92lb. per cubic foot.

The failures of dock-walls, though numerous and instructive, afforded no direct evidence as to the actual lateral pressure of earthwark, because in nearly every instance the failure was traceable to defective foundations. Reference was made to the original Southampton Docks wall, constructed forty years ago, having a height of 38ft. from foundation to coping, and a thickness at the base of 32 per cent. of the height between the buttresses, and of 45 per cent. at the buttresses. If founded on a rock bottom, a fluid pressure of 40lb. per cubic foot would have been required to overturn the wall; but before the backing had been carried to the full height, the wall moved forward in places as much as 3ft. In the recent extension of the same docks the wall had an effective thickness of 45 per cent. at the base, and a fluid resistance of from 60 to 70lb. The Whitehaven Dock wall, 38ft. high and 13ft. 9in. thick, stood perfectly, whilst the Avonmouth Dock wall of the same height and 16ft. thick failed. A somewhat similar case of sliding forward occurred at the New South Dock of the West India Docks, London, where the wall was 35ft. 9in. high, and 13ft. (or 36 per cent. of the height) thick at the base. The fact that the stability of a dock-wall depended far more upon the foundation than upon the thickness was well illustrated by the quay wall at Carlingford, which had a height of 47ft. 6in. and a thickness of only 15ft. at the base. In contrast with this slight structure was cited the Marseilles Dock wall, having a thickness of 16ft. 9in. for a height of 32ft. One of the boldest examples of a lightly-proportioned wharf wall was that built by Colonel Michon at Toul. With a height of 26ft. and a batter of 1 in 20, the thickness of the wall through the counterforts was only 3ft. 7in. at the base, and though the filling was ordinary material, and the floods rose within 6ft. of the top of the coping, no movement had occurred. Reference was made to the failures of dock-walls at Belfast Harbour and in the original portion of the Victoria Docks, and the proportions adopted in more recent works were cited. An early example of a successful wall on a very bad foundation was afforded by Sir John Rennie's Sheerness wall. The subsoil consisted of loose running silt for a depth of about 50ft., covered with soft alluvial mud, and the depth at low water was 33ft. A piled platform was prepared, and upon this the wall, no less than 50ft. in extreme height and 32ft. in effective thickness at the base, was built. Another exceptionally heavy but more modern dock-wall was that of the Chatham Dockyard Extension, the extreme height of which was 43ft. and the thickness at the base 21ft., or, say, 50 per cent of the height.

Walls made of large concrete blocks resting upon a mound of rubble had been constructed in many of the Mediterranean ports, generally with success but occasionally with failure, as at Smyrna, where, owing to the settlement, six and seven tiers of blocks had to be superimposed instead of four, and the quay-wall had after all to be supported by a slope of rock in front. The proportions arrived at by experience were a width of 9 metres at the top, and a thickness of not less than 2 metres for the rubble mound, a depth of 7 metres below water, and a thickness of 4 metres for the concrete block wall resting on the mound, and a minimum thickness of 2·5 metres, and a height of 2·4 metres for the masonry wall coping the concrete blocks. Examples were not wanting of walls founded on rubble mounds where the thickness held a smaller ratio to the height than the 42 per cent. considered necessary by French engineers. The lightest of all, perhaps, was the dry masonry outer wall of the St. Katharine's breakwater, Jersey, which was only 14ft. wide at the base, for a total height of 50ft. The most cursory examination of the cases of failure alluded to would serve to justify the statement, that the numerous failures of dock-walls did not afford any direct evidence as to the actual lateral thrust of earthwork. Thus, remembering that General Burgoyne's battering wall, only 17 per cent. of the height in thickness, supported perfectly the heavy sodden filling at its back, no calculation was required to show that the 32 and 45 per cent. Southampton dock counterforted wall, the 42 per cent. Avonmouth Dock wall, the 36 per cent. West India Dock wall, the 56 per cent. Belfast Harbour wall, and the 30 per cent. Victoria Dock wall, would all have stood perfectly had the foundation been rock, as in the instance of General Burgoyne's experimental walls, instead of mud, clay, and silt, as was actually the case.

The aim of the author in the present paper had been to set forth, as briefly as possible, what he knew regarding the actual lateral thrust of different kinds of soil, in the hope that other engineers would do the same, and that the information asked for by Professor Barlow more than half a century ago might be at last obtained. Although the requirement of the missing data would probably lead to no modification in the general proportions of retaining structures, since these were based upon dearly-bought experience, and not upon theoretical treatises, it was none the less desirable that it should be obtained, for an engineer should be able to show why he believed a given wall would stand or fall. To assume, upon theoretical grounds, a lateral thrust, which experiments proved to be excessive, and to compensate for this by giving no factor of safety to the wall, was not a scientific mode of procedure.

As a result of his own experience, the author made the thickness of retaining-walls in ground of an average character equal to one-third of the height from the top of the footings, and if any material was taken out to form a panel, three-fourths of it was put back in the form of a pier. The object of the panel, as of the 1½ inch to the foot batter which he gave to the wall, was not to save material, for this involved loss of weight and grip on the ground, but to effect

a better distribution of pressure on the foundation. It might be mentioned that the whole of the walls on the Metropolitan District Railway were designed on this basis, and that there had not been a single instance of settlement, or of falling over or sliding forward.

ROYAL ACADEMY LECTURES ON ARCHITECTURE.*

THIRTEENTH-CENTURY ARCHITECTURE—ITALY.

I MUST return again to the country which I referred to when speaking of the so-called "Greek" architect, Buschetto, at Pisa. The architects of the east and south of Italy, of whom he was one, were, in fact, practising an art which, even after their own time, was never really supplanted by Gothic work. And I know few parts of Europe which seem to be more interesting. The work we see there is almost as unlike the contemporary work of France, England, Germany, or the north of Italy, as is that of the Moors executed at the same time in Spain. The churches are usually cruciform in plan, with a central and two smaller apses, all projecting from the east wall of the transept; and in this one respect they appear to owe more to the earliest Roman churches than to any other. But the whole of their decoration is wholly unlike Roman or Romanesque work. The arches are constantly used for ornament only, without being in any degree whatever constructional. Sta. Maria, Ancona, is a good example of this. Here the whole front is covered with arches one above the other, literally carrying nothing. The intrados and extrados of the arches are commonly struck from different centres. The arches are, indifferently, round and pointed. The walls are divided into panels by pilasters at short intervals, generally six or eight feet. These have heavy sculptured capitals, which carry arcades; and these, where there are no windows, are filled in either with circular or lozenge shaped panels of carved or inlaid work. The arches are frequently of horseshoe shape, as in the example shown of a window from Foggia, and some wall arcading from the same church. This is thoroughly Moorish work, and that it should be so is not much to be wondered at, for it is a few miles only from Lucera, where, as I told you in my last lecture, in the thirteenth century Frederick II. built one of the largest castles in Europe for his army of Saracen mercenaries, and gave them the cathedral for use as a mosque—a somewhat strong measure for one for whose character his contemporary, Saint Louis, is said to have had great esteem. It is singular that this cathedral at Lucera should have some more than usually Northern features. The nave and transept have pointed arches and a small clerestory. But the three eastern apses are remarkable for having well-designed buttresses and good Gothic windows, with no trace whatever of the usual Eastern influence. The fronts of these South Italian churches are very uniform in arrangement, and their influence is felt all over the north of Italy down to the end of the fourteenth century. They are generally finished with a flat gable in the centre, and all the roofs are of the same pitch when there are aisles. Even those gables which seem to follow the lines of the structure are often false. The windows in the fronts are almost invariably wheel windows, filled with delicate tracery, or sometimes with Moresque patterns, and always surrounded by a moulding or carved member, which seems entirely to separate them from the wall, on which they became ornamental panels. There are usually flat pedimental canopies over the doors. At Aquila there are round-arched doorways, whose joints are covered with Gothic arcades and gabled and crocketed canopies, with three rose windows above and a wall diapered all over. This front was really not finished till 1315, and yet at first sight it looks like a work of the twelfth century!

More to the west, and within reach of Naples, we see the same sort of influence rampant at Amalfi, at Minuto, Scala, Scaletta, Ravello, and Salerno. At Ravello, indeed, the Palace of the Rufolo family is a complete Moorish house, with its *patio* of two storeys in height, its great gateway covered with a Moorish dome, and its enclosing walls adorned in true Moorish fashion. And the churches in its neighbourhood, though they are not Moorish in the same frank completeness, are full of evidence of the same influence. The Palazzo Rufolo was, I believe, built in the thirteenth century. The steeple of Amalfi Cathedral is of the same date—1276. Its lower stages have extremely stilted round-arched openings, and the upper stage is circular, with four circular turrets at the angles, the centre circle and the turrets being all covered with interlacing pointed arches. A central dome, similarly arcaded, rises over the church of Santa Maria, Ravello. The cloisters, which lend such a charm to Amalfi, are all similarly adorned, and you must note that the arcades project slightly from the face of the wall in all cases, so as to advertise the fact that they have nothing to do with its support; whilst the very design equally shows that most of the apparently arcuated work is false and unnecessary. And they are without mouldings.

My limits only allow me to speak of one other feature in these churches—the pulpits. I take one of those in the cathedral at Ravello as my text. Its date is 1272, written on the marble by the "marmorarius"—as he called himself—of Foggia, who executed it. It is of white marble, inlaid with *opus Alexandrinium* in the richest possible manner. The six shafts which carry it are spirally moulded and inlaid with mosaic, and rest on lions' backs. The mosaic is all let into panels surrounded with carving of most delicate character. The brilliancy of the marble, the delicacy and bright colours of the endlessly varied patterns of glass mosaic, and the richness of the carving, make this certainly one of the most exquisite works with which I am acquainted. Nor is it less remarkable for some of its sculpture. The approach to it is by a staircase guarded at the foot by a doorway, over which is a bust of a queen, executed with considerable technical skill, and of a fair and stately presence. The size of this pulpit is very considerable, and it is one of many. Ravello alone has two others, a second in the cathedral, and one in San Giovanni of earlier date, Salerno two, Benevento two, Sessa one (of A.D. 1224, with round arches), Mosoufo one (with horseshoe arches), and there are many more which it is needless to name. Here I must finish this episode. The art of Italy cannot be understood unless you realise thoroughly how completely different its history and development are from those of the rest of Europe at the same time. Few books put you *au fait* at this passage in the story, and I advise you to consult the only authority to whom I can send you—Von Quast and Schulz's great German work on the architecture of South Italy. But it is by sketching and noting the peculiarities of these works for yourselves on the spot that you will alone really understand them.

From this group I turn now to the North, where at this time many churches were built, conceived much more in the spirit of the early Gothic style than the former were. Of these the best examples for our purpose are those of the Frari and SS. Giovanni and Paolo, Venice, Santa Corona and some others at Vicenza, Santa Anastasia at Verona, and at quite the end of the century the churches of Santa Maria Novella and Santa Croce in Florence. Some Roman examples existed, but these have been so much altered and modified that it is a little difficult to refer to them. The church of the Ara Cœli, and Santa Maria sopra Minerva, are the best preserved. In all these the plans are very similar. They have the usual Italian peculiarity of a transept, out of which a large apse in the centre and smaller ones on each side are projected. Their naves are generally divided into bays, which are absolutely square, while the aisle compartments are oblong in the direction of the length of the building. This is exactly opposed to the usual French and English system. It gives arches of great span, and columns placed very far apart; and one of the results of such an arrangement is that the buildings in which it occurs always look smaller than they really are. The columns are usually plain—circular or octagonal—of great size; there is hardly any moulding on the arches, and the clerestory consists usually of a series of small circular windows, one to each bay. The walls have deep cornices. At Santa Anastasia, Verona, and at the Frari, Venice, the apsidal chapels have the rare peculiarity of being planned with an angle in centre, with a by no means bad effect. Most of these examples are built of brick, and many have timbered roofs to the naves and transepts, and groining to the apses and aisles only. They are thoroughly fine and useful buildings, and though nowhere to be classed in the first rank of architectural works, are yet, I think, the group of building which best deserve study of all that I have mentioned. In them as elsewhere I see much to condemn as well as to admire. Their window traceries are seldom agreeable, and never really skilful. Usually they appear to be pieces of tracery wrought in a single stone, and then cut off to fit the arch under which they are placed. But on the other hand, there are many of their features of extreme beauty. Among these are the porches and monuments. These are commonly built with arches springing from single shafts, with flat gables and canopies over them. Of course, such erections could not stand for an hour without assistance, and this is at once given by an iron tie-bar connecting the capitals. But, with this assistance, there was still felt to be an air of instability in the arch, and this was ingeniously overcome by the addition of a heavy cusp on the under side of the arch, which gave the required effect by appearing to bring the weight within the line of the columns. So much depended on this cusp that it is generally drawn with the greatest care, and this detail shows as much as any the real artistic skill of the architect. Nowhere in Europe is there a more exquisite architectural group than in the little burial-ground of the Scaliger family at Verona. The larger monuments are all of this type, with the addition of a heavy pyramid crowned by a figure on horseback rising from behind the gables. The sculpture which adorns these works is also excellent—very flat, and in low relief, but full of evidence of careful study of natural forms.

In almost all of these churches the use of coloured materials is more or less common. Unfortunately, few of the marble fronts with which they were intended to be finished were ever completed. The lower part of St. Anastasia, Verona, where the soft and delicate mouldings of the door-jambs are built in alternate courses of red, white, and grey marble, is of exquisite beauty. Such a construction, I need hardly say, brings out with great distinctness the most delicate shades of difference in the mouldings. It led the way naturally, also, to the final example of the most perfect arrangement of colour in construction, seen in such a work as Giotto's tower at Florence, which, it can hardly be doubted, was the result of his acquaintance with this beautiful work at Verona. For only a short time before, in 1294, Arnolfo had faced the Baptistery hard by with black and white marble in equal courses, after the fashion of the Genoese builders and of the architect of the tower at Siena. Unfortunately, the custom was to build a blank brick wall at the west ends of the Italian churches, with the idea of completing the work at some future time by the erection of a magnificent marble front, and in a number of instances we find the lower part of this, at the most, existing. The Cathedral and Sta. Croce, Florence, and San Petronio, Bologna, are illustrations of this habit, in addition to the church just mentioned at Verona.

In all accounts of architectural progress it is the religious architecture of the country that first of all attracts our attention. It is there that we see men's greatest efforts, executed in the most permanent fashion, and usually the examples of them which are still to be seen are manifold more numerous, and have a history much more accurately recorded, then have the other buildings erected for secular purposes at the same time. But in Italy the life of the people in the cities, with which the land is so richly studded, was so active, so prosperous often, and so self-reliant, that it may almost be said, in many cases, that the secular buildings are of as much importance as the ecclesiastical. Every important city had its public building—Broletto, Palazzo Publico, or Comunale, or della Ragione—in which its affairs were transacted, and where the courts of justice sat. In addition to these there were an infinite number of palaces built by the wealthy citizens whose families formed everywhere the aristocracy, and generally went on from century to century in the same city, either governing it or taking an active concern in its affairs. Very many of these buildings are as perfect now as they were when first built; and in Volterra, Siena, Florence, Perugia, Pisa, Lucca, Orvieto, Piacenza, Bologna, Como, Milan, and above all in Venice (but at a later

* By Professor G. E. Street, R.A. Lecture No. 4, delivered on Thursday, Feb. 24, to the students of the Royal Academy.

date), so many remain that we are able to form an accurate and fairly complete idea of what these great buildings were. Most of them were founded in the thirteenth century, but enlarged and altered greatly in the fourteenth. Volterra has its palace, built between 1208 and 1257—a large simple unbuttressed building, without any sort of break in its simple outline. It was of four stories in height. Its windows, placed irregularly to suit the rooms, are of trefoiled lights under an enclosing arch, and the lights are divided by a delicate column in place of a mullion. At the back rises a tower intended to carry the city bell. The doorways are simple pointed arches, without any sort of moulding. In this case, as in most buildings of the period, we find a regular series of holes in the wall above and below the windows. There can be no doubt that these were intended for the timber supports of wooden balconies, and that so far from the effect having ever been intended to be what it now is, absolutely without shadow, the original state was as picturesquely varied as was possible by the deep shadows of these balconies, through which the still darker openings of the windows were dimly seen. Not far from Volterra is San Gemignano, where there are not only old houses, but still standing almost perfect a group of lofty towers, which gives the city the strangest possible appearance. Each family erected as part of its home one of these towers. They are very lofty, almost without openings, and with no attempt at architectural decoration. Probably this was confined to an overhanging parapet supported on machicolations at the top, and two great coats of arms emblazoned on the parapets or walls. They have but little architectural interest, but as they were universal in Central Italy I cannot omit to mention them. In Florence the most important work of the period is the Palace of the Podesta—a good deal altered, and now turned into a museum. This was built round a courtyard, on the walls of which the Florentines, who were always desperately fond of heraldry, have inserted in all parts their coats of arms. Open arcades are built on three sides of the court. A great uncovered staircase leads up to a corresponding gallery with open arcades on the principal floor, and access is gained to the various halls and chambers from this. The arches used are sometimes round, sometimes pointed, and the details are all of the severest and simplest type. Here, as at Volterra, wooden balconies, with roofs on the uppermost, were carried along in front of the upper floor, so as to give access independent of that through the rooms themselves. The walls were crowned with an immense overhanging battlement, and a tower rose out of one angle. In the plan, the site being somewhat irregular, no care was shown to make the rooms or corridors or courtyard rectangular. Yet probably not one of the thousands who annually go to admire this really splendid building ever notice the irregularity.

Of other buildings of the same class and date, I shall mention only two or three. The Palazzo della Ragione, Milan (1228), is one of the best. This has an open arcade on the ground story; above this a double string-course enclosing a range of panels with coats of arms, and breaking forward in the centre as a balcony or ringhiera—a common and beautiful feature. The principal floor has also its open arcade on a grand scale, and above this, under the eaves, is a smaller continuous arcade, occupied at intervals by grouped figures in three divisions. The elements of such a composition are extremely simple; none, I think, can fail to be charmed with the effect, and it teaches us a lesson as to the results to be obtained by delicately designed elevations, depending entirely upon good proportion and light and shade. Coming from Tuscany to such a building as this, or to the Broletto at Como, one is much struck by the wholly different temper shown in them. The Florentines and their neighbours seem always to have built in a severely, almost savagely simple fashion. You feel as if ornament were proscribed—as if strong and lofty walls, tall unbroken towers, frowning parapets, sparsely lighted chambers, were required by their laws or their temper. The gateways and walls of Florence were grand examples of a savage sort of simplicity—enormous in size and extent, simple to a degree in detail, but executed with a degre of care and solidity which is very admirable. Sad it is to use the past tense of such works as these. Unhappily Florence for a short period dreamed that she was to be the capital of united Italy, and in order to fit herself for the position set to work to demolish her walls, and to leave her gateways standing out alone in the midst of new boulevards, with the sole result of almost ruining herself financially as well as from our point of view. At Milan and at Como you feel as you do in the slightly later arcades of the Ducal palace—that life was meant to be pleasant and enjoyed, and that the architect's first thought was how to make it more and more enjoyable.

Another important domestic work, begun in 1281, is the Palazzo Publico of Piacenza. This has its lower stage entirely supported on open arches, giving to the piazza in front, and to the usual inclosed court in the centre. The whole of the lofty lower stage is of white and red marble, whilst the upper is of red brick, with a marble cornice supporting a Ghibelline battlement. All the detail is extremely elaborate, and the brickwork especially is designed with extreme care. The supporting arches are pointed, the decorative arches semicircular, and all the windows have coupled shafts in place of mullions. Recesses are formed in the wall for paintings, of which traces still remain. The great advantage which the study of these Italian domestic buildings affords to us that to a very great extent they show us a noble class of work, dignified, grave, and often very beautiful in detail, and in almost all respects capable of being used consistently with our own notions of comfort and convenience. They are of great extent, and their chambers are lofty and large. The treatment of their windows is particularly worth notice. The stonework is complete in itself, shafts take the place of our mullions, and balconies are often provided in front of the windows. The glass is fixed in a wooden frame set behind the window-shafts, so as not to interfere with their effect. In the larger houses there is generally a courtyard, in the centre of which is the well. The ground-story is either supported on open arches or appropriated for cellars, stores, &c., and the staircase leads up at once and often in the courtyard of the house to the Piano Nobile. Here the rooms are of fine dimensions, some of the more important being vaulted; and, if we picture them to ourselves as they once were, we may imagine no reasonable amount of comfort as wanting. They were the abodes of civilised people, much larger and more stately altogether than we are in the habit of making our homes, and full of suggestiveness for us. On the other hand, there were peculiarities which, fortunately, we do not want to imitate. The more important houses had towers attached to them, erected for purposes of defence. They have no openings beyond those required for the discharge of missiles. Their battlements were swallow-tailed if the owner belonged to the Ghibelline party, square if to the Guelphs. From their walls were bracketed forward timber platforms, by means of which the approach to the doorway could be commanded. They are almost invariably plain square buildings, without break or buttress of any sort, and though sometimes of great size, nearly always extremely simple in design and detail, and really more like large square chimneys than anything else. Would that I could tell you more on this head! But the time is too short, and I have left much unnoticed that I ought to have touched upon. There are, for instance, those vast Halls of Assembly at Padua and Vicenza, the former no less than 90ft. wide and 230ft. long; the latter smaller, but still 72ft. wide. They have simple-arched wooden roofs of dark timber, and the walls at Padua are covered with paintings, which have been well described in the "Annales Archeologiques" by my friend Mr. William Burges. Then there are the cloisters, which are so numerous and so beautiful. Many of them are of two stages in height, and their long series of arches in each stage are carried on coupled marble shafts. Some of the best are at Verona and Genoa, and of a more elaborate kind are those of St. John Lateran and St. Paul without the Walls at Rome. These last are carried on coupled or quadrupled shafts, plain, moulded, or spiral; their arches are semicular, and they have rich and rather Classical cornices, and are filled in all plain spaces and round the arches with lovely decoration in glass mosaic. These were probably executed by one of the Cosmati family, who, in the convent of Sta. Scholastica, at Subiaco, in the wild glen which leads to the mountain sacred to St. Benedict and St. Francis, built a simpler cloister of the same sort, and left his name inscribed on the cornice. Beautiful as many of our English cloisters are, I think they never quite equal these Italian examples. One is charmed by the grace and simplicity of the design, by the beautiful proportion of the arcades, and by the evident skill of the men who contrived to carry their walls upon such delicate couples or clusters of columns, without any appearance of their being too weak for their work. I ought also to tell you of the baptisteries, beginning with the austere examples at Parma and Lucca, and going on to Pistoia, Cremona, Asti, Florence, and many more. They are almost all polygonal or circular buildings, Lucca being the only exception, and many of them delightful, not only in design, but in the decorations which have been added to them. I ought also to speak to you of the domes of this period, which we see at Ancona, at Sta. Maria Arezzo, and elsewhere. Not less does the Italian treatment of towers demand notice. They are either entirely without buttresses, or with small pilasters at the angles, and repeated once or twice on each face. Each stage is similarly adorned, and usually they are repetitions one of the other. A good example is the campanile of the cathedral at Viterbo. Forsome 50ft. in height, it is a plain mass of masonry. Above this, four stages of coursed black and white stone, each stage having two two-light windows, and divided from the next by decided string-cornices, completes the elevation of the tower, above which is a very low spire, a feature constantly introduced. This sort of design is of common occurrence. Evidently it is taken directly from the early Roman campaniles, of which so many still remain. I ought to say much more about these towers, which are so striking a feature of Italian buildings; but not less ought I to say something as to the monuments which everywhere adorn the walls of the cathedrals and churches, both inside and out, and oftentimes the piazza by their side. But time fails me: I have detained you long, and my only fear is, having had so many things to speak of, that I may not have dwelt long or exhaustively enough upon any one of the points which I wish to impress on your memory. My hope is that if any of you have not concerned yourselves on the subject hitherto, I may have induced you to take an interest in what really contains subject for study of equal importance to all of you, whether painters, sculptors, or architects.

To sum up shortly what the study of Italian art teaches us in the 13th century, I think it may be said that, unlike the nations of the North of Europe, the Italians never really or at all heartily accepted or worked out the changes which came naturally from the use of the pointed arch. They never really realised what its use led to. Their system of groining, for instance, is from first to last simple to a degree. No difficult problems were ever faced or solved in its construction. Ground-plans were never carefully studied; there is little ingenuity or skill displayed in them, and hardly any improvement on those which the earliest Roman church builders had left them in such churches as St. Paul without the Walls or the Basilica at Aquilesa. This is the more strange because some of the early Italian plans are extremely good, and the fondness shown for the circular form in so many baptisteries might have been expected to produce the same effect as it certainly did in Rome. The plan for the small baptistery at Albenga, with its alternate circular and square recesses and its central dome, ought naturally to have led to something far better than Niccola Pisano's apse at Padua. And it is very strange, seeing that the Italians almost always used the apsidal east end, that they should so very rarely have built an aisle and chapels round it, though they must have been aware of the singularly fine effects that their neighbours in France were achieving at the same time. Their sole care was, in fact, to make their ornament beautiful. It never occurred to them that the proper work of an architect is first of all to make his plan as beautiful, as economic in its use of material, and as light and elegant as is consistent with stability. They were extremely careless about the general outlines of their buildings in France. On the exterior, sham gables and false constructions of all sorts abound, and the proportions are seldom agreeable; and any attempt to produce fine effects by combinations of the steeples with the buildings to which they are attached is extremely rare, even if it was ever attempted.

The mouldings used are not good in themselves, or drawn with any real feeling for the light and shade to be produced by them: and when they are used for an archivolt, they are usually set upon the capital which receives them in so careless and ignorant a manner as to produce the worst possible effect. The Italians never seem to have cared much whether they used a pointed or a round arch. Indeed, they hardly realised that one gave them more power than the other, and consequently the sort of constructions to which they confined themselves were nearly always such as could just as well be contrived with a round as with a pointed arch. The feature which more than any other distinguishes true Gothic work—the buttress—is rarely used. If it is, this is generally for ornament only, and I do not recollect an instance of a flying buttress. The Italians never discovered that the proper disposal of buttresses, so as to meet thrusts and weights at given points, was far more economical than the persevering use of thick walls without buttresses. Another difference is that almost all real Italian ornament is applied, and does not in the least belong to the structure. An Italian window is ordinarily surrounded by a moulding, which makes a sort of frame for it. The English window of the same age has a moulding above it to throw off rain, but elsewhere its mouldings are really cut in the wall itself, so that the window appears to be what it is—a necessary part of the fabric. In addition to these peculiarities, the treatment of windows was never very good. The best examples are the domestic windows, in which shafts take the place of monials with very beautiful effect, but these seldom led to the execution of anything like our Northern traceries; the spandrels between the centres of the window-lights and the inclosing arches being seldom pierced, and often left with no relief—perfectly plain. The circular windows in the west fronts are innumerable. Their tracery, when it remains, is generally of the fourteenth rather than of the thirteenth century. One of the very best examples of the latter period anywhere is in the west front of the Church of Sta. Maria, at Toscanella, in which the doorways, and the arcade between them and the windows, are carved profusely with well-executed dog-tooth enrichments. This window is rightly called a wheel. It consists of three circles, each divided into panels by columns, which take the place of spokes, and between these, sharply pierced cusped circles give a brilliant effect of light and shade to this beautiful design. One goes to Toscanella to see Etruscan walls and remains, and I confess to a real sensation of delight when in this sad and forlorn old church standing with the cathedral outside the walls, and unused apparently, save by a hermit, who divides his time between them, I came upon so thoroughly charming a feature as this window and front.

The Italians, as we have seen, were always very open to accept fragments of work from other lands, it mattered not in what style. They employed Greeks, Moors, Frenchmen, Germans, Catalonians, side by side, at the same time. (They are always said to have examples of Norman and Anglevine art; but of this I have never seen any evidence whatever. These people seem to have employed the native artists in their buildings.) The architecture of Italy admits less than that of the rest of Europe of regular classification. It was very eclectic. There was no passion for any one style all over the country. The architects rather than architecture ruled; and each had his own fashion and way of working. Then, again, the architects were usually sculptors; and as their taste for the sister-art increased, they seem to me somewhat to have sacrificed the older art to her younger sister. With so much that is disappointing, uncertain, and unprogressive, there are, however, redeeming features which will always render the study of early Italian art not only most instructive, but, at the same time, most fascinating. The beauty of many of the features in detail is as great as it well can be; and the taste with which coloured materials are used in construction is far in advance of anything that the rest of Europe can show, either then or afterwards. The Italians inherited an admiration for, and due sense of the beauty of, detached columns. These, being used for their own beauty, were constantly made to taper slightly, and were used frequently to carry heavy weights, though with the closest approach to insecurity. In no country is the use of these delicate shafts brought to such perfection. The shaft is used by itself, coupled with another, and in groups of four and five. Sometimes a precious block of marble is cut into four shafts, apparently knotted together in the centre. It is spiral, fluted, moulded, and carved. It is used with great constructive skill, an arcade carried on small coupled shafts carrying, as at Genoa, a second cloister above. The arches of these cloisters are as simple as they can be; but the shafts are so delicate, and their caps and bases so well proportioned, that I doubt whether any cloisters are more beautiful.

In spite of all such architectural shortcomings, it must be said that in the combination of painting and architecture all other architectural schools were hopelessly distanced by the Italians. The root of all that is beautiful in their work was struck in the 13th century; and it is in the magnificent Church of St. Francis, on the steep lower slopes of the Apennines, that we see already in perfection the combination of the two arts. There are here three churches, one above the other, built round the tomb of St. Francis. One enters the middle church by a pointed doorway between walls panelled with the red marble of Perugia, in a lovely diaper of cusped circles. A dark and sombre collection of chapels, decorated on all sides by the painters of the 13th and 14th centuries, leads one on to the altar. Here cunningly-wrought screens of iron between marble columns guard the sacred central spot, and the eye becomes by degrees accustomed to the half-light, and sees and understands the subjects and colours which Giotto and others have left on vault and pillar and wall. The upper church was meant to be entered by a fine western doorway, but this is seldom open now; and after drinking in this strange and mystic effect of the crypt, access is gained by a small newel staircase to the upper church. The change is one of the most startling that I know. From the darkest of sanctuaries you find yourself in a minute transferred to the brightest, the most beautiful, the most joyous. The architecture of the upper church is light and graceful, the windows are large, and the walls from the floor to the centre of the vaulted roof are covered with paintings, the whole of which are bright in tone, beautiful in arrangement, and, as it seems to me, full of the most exquisite sentiment, even if the mere draughtsmanship is imperfect. Cimabue commenced his works at Assisi in A.D. 1265. The roof and walls of the nave were then ready for him and entirely undecorated. The former, at least, is either his work or that of his immediate followers. The nave is of four bays in length. He painted the first bay with figures of the Four Doctors of the Church, and the third with the Virgin, St. Francis, and St. John the Baptist. The intermediate bays he covered with mere decorative colour—blue studded with stars—the grounds of the subjects being gorgeous with yellow or gold. Borders of exquisite design and variety follow all the leading lines of the construction. The figures show, it is true, no few traces of Greek or Byzantine teaching and influence; but the simple dignity of their attitudes and draperies, the charm of the general system of colour, and the grand decorative effect produced by the alternated bays of subject and ornament, leave little to be desired. Nowhere, indeed, in the whole realm of art can one put one's hand on a work in which the triumph of the Italian school of the thirteenth century is more certainly seen or more universally acknowledged than it is here. And if I have been critical to-night as to what appears to me to be the shortcomings of Italian architects, you will perceive, by the terms in which I conclude, that the criticism comes from one who appreciates with enthusiasm what he holds to be the real and undying beauty and interest of this great period in the history of Italian art.

MR. H. H. STATHAM ON ORNAMENT.
IV.

At the Royal Institution, on the 7th inst., Mr. Heathcote Statham delivered the concluding lecture of a short course on "Ornament, Historically and Critically Considered." He commenced with a reference to the Renaissance movement, which, based upon a study of and admiration for Classic literature, effected, early in the 16th century, an entire change in the course of thought and modes of expression throughout Europe. Building and decoration had previously been carried out almost intuitively, men working on the lines of their neighbours, or trying to improve their work without an apparent knowledge that they had a style. But from the time of the Renaissance it became impossible to go forward with the old Gothic modes of working. The people had eaten of the tree of knowledge of good and evil, and the result was very apparent, though it might be disputed whether this result was a benefit or an injury to art. From this period Art was self-conscious, and recognising types and styles became imitative of them, instead of originating new forms as needed. The only art which afterwards rose to the highest pitch of perfection was that art which was least fettered by precedents—that of painting. In all other forms of art the first freshness had been lost, and practice was being reduced to mere pedantry. In regard to ornament, this re-birth was based not on the study of Greek, but on Roman works, and had its origin in Italy, only slowly proceeding thence to France and England. At first the new work had everywhere a common character, but gradually diverged into well-defined groups. Everywhere the new style was essentially imitative, and was less strict in adherence to principles, less logical, in fact, than the older works. Its very conventionality had a nearer approach to copyism from nature than had before been seen. The relation to nature was very capricious; natural objects were treated in decoration in a highly artificial manner, and were mingled with artificial objects and grotesqueries in a manner hitherto unknown. Individual tastes now asserted themselves, and men, in place of working in common lines of style, adopted manners of their own, and so we could more readily distinguish the work of an individual designer, whether in architecture or decoration, after the Renaissance than the Gothic period. The lecturer passed before his audience what he termed a gallery of illustrations, consisting of coloured drawings of Renaissance ornament and textile fabrics, lent by the South Kensington authorities, and a large number of casts lent by Messrs. Jackson and Graham, and by these instituted a series of comparisons between the Renaissance work of various countries, showing that in Italy the Roman manner was almost indigenous, and was there frequently well carried out. Some of the great artists failed, however, almost entirely in their ornamentation. Thus he exhibited a piece of decoration by Michael Angelo, which was one of the most vulgar in conception of its period, and another by Guilio Romano, where the ground of design was covered with free stems of foliage, up which lions were running. The German work was, as a rule, worse than the Italian, and utterly wild in its grotesqueness. The earlier types of French work were characterised by better taste, and even those of the Louis XIV. period often showed considerable breadth of style, but there was less logical sequence of ideas than in Italian work. In the time of Louis XV. artificial objects were largely employed, and the growth of lines from each other was frequently neglected; in the Louis XVI. period the design was naturalesque and full of realistic foliage. Gradually the taste sank into overwrought fancies, and merely pretty contrivances with no vigour or character. Some of the forms of Renaissance ornament afforded a good illustration of the presence or absence of the quality called "style," which really meant homogeneous character; the difference was illustrated by the contrast between a piece of ornament by Le Pantre, and one from "Richardson's ornaments." Granted a homogeneity of character, it was possible for a design to be relatively effective, although not conceived in pure taste. It was interesting to note the occasional admixture of Oriental art with Renaissance ornament, and this was especially noticeable in specimens of bookbinding, where the interlacing strap ornament derived from Arabic sources was typical of good work in French and German libraries. This Arabic quality, which more or less pervaded the treatment of book-covers throughout Europe, was probably due to the fact that the first binders were Venetians, who were the connecting link between Europe and the East; as the art was a novel one, the work done by the best workmen became a type for general adoption. Proceeding to consider the style introduced by the Adam Brothers in the last century, the lecturer observed that these brothers were exceedingly clever men, and their work, which was derived largely from Pompeian source

applied with considerable originality, was well worthy of study, but it was evident that its present popularity was nothing more than a mere fashion, for it was frequently combined with Japanese ornament, than which few things could be more dissimilar. In analysing Japanese work, there was seen to be very little true ornament in it; much that was called ornament was only imitation of nature. Almost the only example of geometric ornament was a variety of key pattern, which nearly approached the Celtic type. Where colour was introduced, however, it was always well used; natural forms were exceedingly well conventionalised, and where no attempt has been made to copy, the designs were very ingenious in form. The great defect of Japanese ornament was its lack of reference to the space and shape to be covered, and its thoughtless irregularity. There were two ways in which ornament could be applied; the one to emphasise the leading lines of construction, as in the fluting of a column, the other to occupy a surface otherwise uninteresting, and of both principles numberless illustrations were to be seen in nature, in the treatment of the plumage of birds, and the wings of butterflies. It was in the emphasis of the leading lines that Japanese art so largely failed. The Adams' work, on the other hand, was a pretty adaptation of late Roman decoration. Yet, notwithstanding the inherent difference between these styles, both were simultaneously in favour amongst us. In a recently-published book on the decoration of the house, they might see an illustration given as an example to be followed, in which most of the furniture was of the Adam type, but the door-panels had naturalistic foliage, copied from Japanese work. Now these panels were really mere spaces between framing, yet the painted foliage was arranged irregularly, and the sprays were continued from one panel to the next, violating the facts of the construction. Again, the lecturer showed sketches of Chippendale and Sheraton chairs, the one covered with misapplied carving, uncomfortable and apparently weak, the other simple and suitable in treatment; yet those who professed to guide public taste would recommend one equally with the other, and the sale would be equal. Mr. Statham showed a richly-coloured hanging, designed by Owen Jones, which he considered as almost perfect in pattern and colour, but which the manufacturers told him had been neglected for many years as out of fashion. Such designs should never be out of fashion. In continuation, he suggested that it would be well if painters and sculptors would give more attention to the principles of ornamental design than they did, as it would often prevent the disfigurement of otherwise pure work. He wished also to protest against the exaggerated importance that was just now being attached to ornament by critics. They had recently been told that if means were limited it was better to procure a really good wallpaper than engravings or paintings: a piece of childish folly which ignored the far higher value of a human figure or a landscape over the most clever pattern. As Drummond had well said:—

"But silly we, like foolish children, rest
Well pleased with coloured vellum, leaves of gold,
Fair dangling ribands, leaving what is best,
On the great writer's sense ne'er taking hold;
Or if by chance we stay our minds on aught,
It is some picture on the margin wrought."

Let us, the lecturer added, by all means recognise ornament as a highly interesting study, and understand its principles, but do not let us, like the foolish and invertebrate Maudles and Postlethwaites of the day, place it above the great intellectual interests or the great moral realities of life.

THE WASHINGTON MONUMENT.

THE report of the Chairman of the Joint Commission for the Completion of the Washington Monument, gives some interesting details of the work recently accomplished. The underpinning with concrete has been successfully completed without causing the slightest crack or opening in any joint of the structure, weighing more than thirty-five thousand tons. During the summer of 1879 the terraced embankment around the base of the monument was finished, and the iron framework for the stairs and elevator was erected in the following winter. This framework consists of superposed Phœnix columns, four of which form the inner angle posts of the staircase, and are steadied by 9in. iron beams at intervals, of 20 feet in height, each passing through two columns, and being securely built into the masonry at both ends. The staircase is so planned that each of these beams forms the inner edge of a long landing, extending the whole width of the tower inside the walls, so that the staircase consists of short straight flights, each having 18 steps and ascending 10ft. The elevator shaft consists of four similar columns, forming a square nearly 10ft. on each side, and secured to the angle columns of the staircase. This framework of iron is carried up a little in advance of the masonry, and a crane or derrick is attached to each of the four outer columns, with a boom 19½ft. long, which enables every part of the wall to be reached. When the masonry has been carried up to the level of the framework, another section, of 20ft. in height, is added, the derricks and hoisting apparatus raised upon it, and the work continued. By this arrangement, the construction can be carried on with great economy and speed. To prevent accidents to the workmen, a net was woven and stretched around the top of the monument. Lightning has been guarded against by connecting the four columns of the elevator shaft, through large copper rods, with the water in the bottom of the well beneath the middle of the foundation. Already 22ft. have been added to the height of the monument, and Colonel Casey reports that the material on hand, and the available balance of the appropriation, will be sufficient to build 52ft. more.

FIRES IN THEATRES.*

CAPTAIN EYRE M. SHAW, of the London Fire Brigade, and author of several useful manuals on Fire Surveys and Protection, in this small *brochure* furnishes his readers with practical advice, derived from long experience in the management of fire-brigades, on the risks to which theatres are subject, and we have no doubt that if the recommendations contained in Captain Shaw's little book were fully carried out, the risks of fire and loss of life incident on that terrible and senseless want of control known as "panic" would be considerably diminished. We think it perfectly justifiable to tell nervous people of the risks to which they are exposed in attending theatres and music-halls, and, indeed, any public assembly; and even churches are not exempt from risks of this kind. It is some satisfaction to know, at least, that the ordinary sources of danger that exist in such buildings are known, and can be pointed out from actual experience, and to hear so able an expert as the author is asserting that, "with proper construction, judicious management, and sound precautions, there would be no danger for the audience, and very little for the building." The author enters into the various points common to buildings of this kind, and the necessity of preserving a space round theatres, of maintaining free and unobstructed street approaches, of proper police supervision, and co-operation between the police and the sworn constables and door-keepers; the importance of having exits not less numerous than the internal divisions of the auditorium, according to prices, that the inlets should be well lighted, free from obstructions, steps, and other dangers likely to cause injury, and that the long corridors and passages should be broken by barriers at intervals, so as to prevent a crushing at any point. The suggestions made as regard the corridors, entrances, and exits, are well worth the attention of architects. "Passages meeting at a right angle, or end on, are always objectionable, and the different portions of the audience may be allowed to join at a little distance, and at an angle that would not cause an obstruction in leaving. Steps, however slight, are dangerous, but gradients are less objectionable if they do not exceed 1 in 10. Handrails to staircases and enclosed passages on both sides are a great security in time of a panic.

As regards the walls of the structure, Capt. Shaw strongly insists upon solid, well-bonded cross-walls; but coming to the main principle of the recommendations, the author would divide the theatre into as many separate parts as possible by solid fire-proof walls. Thus the manager's rooms, dressing-rooms, stores, the stage, auditorium, corridors, staircases, halls, &c., would all be divided by such walls; the stage would be further separated from the auditorium than it usually is by means of a fire-wall carried through the roof above the stalls with wrought-iron doors, and the great opening would have a metal curtain which could be dropped at a moment's notice, and worked by metal chains. These two main parts of the theatre being separated, the auditorium may be divided by the provision of separate entrances and exits, according to the price, and the stage in like manner might be easily sub-divided by good divisions between the dressing-rooms, workshops, and stores. In this manner Capt. Shaw would divide the whole building into as many distinct and separate risks as possible, and the greater the number of sub-divisions, the less the danger. It is quite possible, as he shows, to diminish the risks of fire to the audience so materially as to leave nothing to dread in case of an emergency; and if managers would follow out these suggestions much might be done towards placing our metropolitan theatres in a safer position than they are. We dread to think of a fire at any of our crowded theatres, with narrow passages and such few exits. The author proceeds to discuss the spaces to be allowed in lobbies and passages in case of a rush into them, these being closed off by iron doors, and some useful details are given here; as also the number of exits, and he gives a variety of useful cautions to managers and others. Two separate staircases for each part of the audience, as far as possible apart, are recommended, but at least two staircases ought to be provided. There are many details which concern stage-managers more than architects; and the hints on the training of men to act as night watchers are particularly worthy of attention from theatrical managers and the public. It would be better for the fire-brigade to supply a fire-watch than trust the safety of a crowded theatre to an attendant merely dressed up as a fireman.

* Fires in Theatres. By Eyre M. Shaw, London Fire Brigade. London: E. and F. N. Spon, Charing Cross.

BOOKS RECEIVED.

The City of London Directory, 1881 (W. H. Collingridge and Son) is issued for the eleventh time, and possesses its usual features of usefulness. —— *Practical Photography*, by O. E. Wheeler (London: The *Bazaar* Office), seems a practical manual of a science which is fast becoming an art, and has always had a fascination for amateurs. —— *Toys and Toymaking*, by James Lukin, B.A. (London: the *Bazaar* Office), is just the book for the boys who delight in knives, chisels, and saws, and who may by its pages be induced to befriend their younger brothers and sisters instead of damaging the furniture of their parents. —— *Instructions for the Use of the Eureka Slide-Rule*, by James Noble (Sheffield: T. Rodgers), is the 3rd edition of a handy series of rules for the use of a very handy slide-rule. We have also to hand a copy of the seventh edition of *Lessons in Elementary Mechanics*, by Philip Magnus, B.Sc., B.A. (London: Longmans, Green and Co.), and the *Proceedings of St. Paul's Ecclesiological Society*, which is illustrated by ground-plans of Stone and Swanscombe churches, and two photo-lithographs of portions of the former beautiful 13th-century edifice.

The local board of Mountain Ash, near Merthyr, discussed on Monday night the manner in which Mr. John Herbert Jenkins, their surveyor, had carried out his duties with reference to the sewerage works. It was proposed and seconded that Mr. Jenkins be requested to resign his appointment; but a letter was read from that officer, stating that he had trusted to Mr. John Lewis, the inspector and clerk of works, in whom he had every confidence, to see the work properly done, but that this would be a lesson to him, and he hoped the board would not again have cause to complain. The chairman said the real fault was that of the board in accepting a contract from inexperienced contractors, and the surveyor ought not to be made the scapegoat for the board's want of care and wisdom. The following amendment was then carried by 7 votes to 2, "That the surveyor, having acknowledged his fault, and having assured the board that they should have no reason to complain again, the board overlook the matter, and that he be allowed to retain his appointment."

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ILLUSTRATIONS.

DOORWAYS IN CONSTRUCTIVE FAIENCE.—PICTURE-GALLERY AT THE ROYAL GARDENS, KEW.—LUDFORD HOUSE, NEAR LUDLOW, SALOP.—NEW EPISCOPAL CHURCH AT FORFAR.—RESIDENCES, NO. 1, PORTLAND-PLACE.—DOOR AT LECCI, S. ITALY.—DETLING CHURCH, KENT.

OUR LITHOGRAPHIC ILLUSTRATIONS.

BURMANTOFTS FAIENCE.

We called attention last week in our review of the Building Exhibition to the specimens of faience, terra-cotta, bricks, &c., exhibited by Messrs. Wilcock and Co., of Burmantofts, Leeds. Under the general term of Burmantofts Faience, this firm has introduced a speciality which at once commends itself for many forms of use and artistic application in connection with exterior and interior decoration and construction. We understand that the fireclay used is peculiar to the district in which Messrs. Wilcock's works are situated, and that it is composed of a very pure combination of silica and alumina, with but the very slightest trace of iron. It is thus specially fitted for the purpose to which it is now being applied, as its freedom from impurities permits it being worked into a thoroughly plastic form. The absence of iron in the clay permits the employment of intense heat without the colour being injuriously affected by oxidation, and it is thus possible for the faience to be fired in the kiln at a heat far beyond any form of pottery, and even exceeding the melting point of steel, thereby securing a thoroughly hard, durable, and compact body of such a character as to receive a glaze in any colour without the slightest possibility of its being affected by any extremes of either heat or cold. The colour and the glazed surface are produced by a combination of metallic oxides which are thoroughly fluxed to the body, and are inseparable from it either by mechanical or atmospheric causes. When in the plastic form the clay can be moulded into any form desired; and as we understand that no machinery or mechanical means are employed in this process, but only skilled hand-work, it will be understood that hardness and monotony of effect are avoided, and, indeed, this is very observable in the designs produced, which have that pleasing variety in the detail of execution indicative of true artistic handling. The material does not look stamped or embossed, and the absence of the stereotyped effect so observable in many decorative productions, is not one of the least of the merits of the faience. It will be readily understood that a material thus manipulated has many obvious uses, and here it is presented to us in the form of blocks for external decoration, varying in size from 6in. square to 4ft. or 5ft. superficial area, modelled in rich deep effects, with both shadow and colour well developed. It thus presents a material enabling colour to be judiciously and tastefully introduced into exteriors in a thoroughly artistic manner and substantial form. For strings, spandrels, arches, panels, and other decorative and enriched forms of exterior architecture it appears to meet a decided requirement, as we are unacquainted with any material possessing its varied qualifications. For interior work its uses are even more varied, for made either in the form of blocks or tiles, and in any shape or size, it is capable of giving unique effect for friezes, dados, hearths, and firesides, whilst it is also well calculated to be used for panels in connection with wood for mantelpieces, and other forms of house furniture. It is also capable, as illustrated at the exhibition, of making very beautiful decorative pottery. Our illustration shows some examples of terra-cotta and constructive faience indicating how the glazed material which we have now briefly described may be used, from designs prepared by Mr. Maurice B. Adams, A.R.I.B.A. The country-house entrance-doorway with the shell hood has faience panels and enriched consoles, the framework here, as in the other examples, being in red and stone-coloured terra-cotta. The upper Gothic entrance-porch has mural decorative panels, and dado in the same glazed material.

MISS NORTH'S GALLERY, KEW GARDENS.

During many recent years Miss North has visited nearly all the typical portions of the tropical and sub-tropical regions of the globe, for the purpose of studying and delineating their scenery and floras. Commencing with Madeira and Teneriffe, she afterwards spent some time in Jamaica and the Brazils, and subsequently sketched the wonderful vegetation of California, on the west coast of North America. Thence she visited Japan, Borneo, Java, Singapore, and Ceylon. She afterwards spent two years in India, and last year revisited Borneo, and is now engaged in a tour through the Australian Colonies, and proposes returning through New Zealand and Taheite to San Francisco, and thence home. In these extensive travels, and long sojourns abroad, Miss North's principal object has been to depict in oil, in the open air, and in the presence of the objects themselves, all the varied and beautiful forms of tropical vegetation. Being an industrious and rapid worker, she has got together an immense number of sketches representing the trees, flowers, and fruits of the countries she has hitherto visited. When the results of her present journey round the world are added, they will form a nearly complete collection of the typical forms of tropical vegetation, with the scenery of the countries in which they are found. A selection of these sketches were exhibited in the western galleries of the Horticultural Gardens, at South Kensington, some years ago, and afterwards for a short time in the galleries at 9, Conduit-street, where they attracted the attention not only of artists and amateurs, but of scientific men, as much for their beauty as for their extreme truthfulness. Among others, Sir Joseph Hooker was so impressed with the desirability of having such representations of vegetation in a state of nature, and of the scenery in which it is found, to accompany and illustrate the specimens collected in the herbaria and hothouse at Kew, that he induced the Government to grant a site in the gardens there, on which the gallery, which is the subject of our illustration, has just been completed. It has been erected wholly at the expense of Miss North, and intended as a gift from her to the nation. It is situated opposite to the "Temperate-house," in the park adjoining the gate leading into the Richmond-road, and consists of a hall 50ft. long by 25ft. wide, and as many high, lighted by a clerestory. It is calculated that this gallery will contain between 400 and 500 of Miss North's sketches, arranged partly on the walls, with others on screens, classified according to the countries in which they are found. There is, besides, in the rear of the gallery, a small studio lighted from the north, and a caretaker's house in a corresponding situation on the southern end of the gallery. An important feature of the design is a verandah extending round three sides of the gallery, which is intended to afford shelter from the sun or rain to visitors in that part of the gardens. Its pillars will eventually be covered with creepers, which add considerably to its picturesque effect. The whole is in red brick with Bath stone dressings, and the roofs covered with zinc, and is designed in a plain Classical style, without much ornament. Mr. James Fergusson, F.R.S., is the architect.

LUDFORD HOUSE.

Ludford House, near Ludlow, is of very considerable antiquity, a deed in possession of the late owners, the Chalrton family, making mention of a house here in the 11th century. In the time of the Conqueror the manor of Ludford belonged to the Lord of Richard's Castle. Afterwards passing into the hands of a family known as Jordæn, of Ludford, it went from them into possession of the Hospital of St. John Baptist, in Ludlow, on the opposite bank of the river Teme. During the reign of James II. Ludford was bought by a certain Sir Job Charlton, who had the honour of entertaining therein that monarch during the time of his residence at Ludlow Castle. Ludford House is rich in detail of the best kind in woodwork, furniture, &c., and there is much to repay considerable study. The drawing, which is by Mr. Theodore Howard, shows one side of the house, which, though not the best, is a good representative front.

ST. JOHN'S EPISCOPAL CHURCH, FORFAR.

This church has been erected by the congregation at a cost of about £7,000. All the money has been raised by voluntary subscription. The walls are built of local stone with Polmaise stone dressings, which are carried round the interior of the windows, doors, and arches. Inside they are lined with ¾in. red tiles in 4½in. courses, which in the chancel alternate with 9in. belts of alabaster to every two or three courses of tiles. A handsome organ has been subscribed for, and is being fitted up by Conacher, of Huddersfield. The church is to be heated by a system patented by Mr. Cunningham, of Dundee. Mr. James Scott, Broughty Ferry, is the builder, and Mr. Wm. Bruce, the clerk of works. The architect is Mr. R. Anderson, A.R.S.A.

RESIDENCES: NO. 1, PORTLAND-PLACE.

The illustration represents an important building just completed, from the designs of Mr. C. J. Phipps, F.S.A., at the angle of Portland-place, Langham-street, and Chandos-street, just opposite the Langham Hotel. The ground-floor has two residences, with the basements below them included. Each of the upper stories contains a complete residence on each flat, and are arranged as shown on the plans. The floors of each flat are constructed of cement concrete on iron girders. An hydraulic lift is arranged in the centre of the principal staircase. At the entrance-door is a porter's lodge, having command of both the principal and the servants' staircase. That residences on flats are in demand, may be assumed, as these were nearly all taken before the building was completed, and only the first floor remains as yet unoccupied.

REFERENCES TO PLANS.

GROUND PLAN.	FIRST FLOOR PLAN.
CHANDOS-STREET SUITE—	1 Bedroom
1 Bedroom	2 Dining-room
2 Dressing and Bath-room	3 Drawing-room
3 Sitting-room	4 Ante Drawing-room
4 Servants' Staircase	5 Drawing-room or Bedroom
5 Hall Porter's Room	6 Bedroom
6 Lift	7 Bath-room
PORTLAND-PLACE SUITE—	8 W.C.
7 W.C.	9 Entrance Vestibule
8 Bath-room	10 Lift
9 Bedroom	11 Bedroom
10 Drawing-room or Bedroom	12 Ditto
11 Ante Drawing-room	13 Ditto
12 Drawing-room	14 Ditto
13 Dining-room	15 Servants' Staircase
14 Bedroom	16 Larder
15 Service and Lift from Kitchen	17 Wine-cellar
	18 Coal-cellar
	19 Kitchen

SMALL STAIRCASE, LECCI, ITALY.

This interesting drawing was prepared by Mr. Sydney Vacher, from his sketch made on the spot, to illustrate the architectural treatment of small staircases when Mr. Aston Webb read a paper on that subject a short time since before the Architectural Association. The lecture was printed by us at the time, with illustrations.

OLD LECTERN, DETLING CHURCH, KENT.

The fine old lectern at Detling Church, Kent, has recently been brought into its ancient use, or rather it has been so restored as to be used on reading the daily Lessons from. Originally, three desks, on a sort of pillar with four sides sloping each way and turning on a pivot at the top of the stand, were used from whence to chant the breviary services, as they are at the present day in the chapter-houses abroad. The Detling Lectern is of Decorative date, and is, perhaps, the most elaborate and beautiful example of its kind in this country. A drawing of it is given in Parker's "Glossary of Mediæval Architecture." The drawing we reproduce today is by Mr. Sydney Vacher, and the pulpit seen in the view was designed by the late Mr. Carpenter, the well-known Gothic Revivalist. The reading-pew shown on the left has lately been made up from the door of the pulpit.

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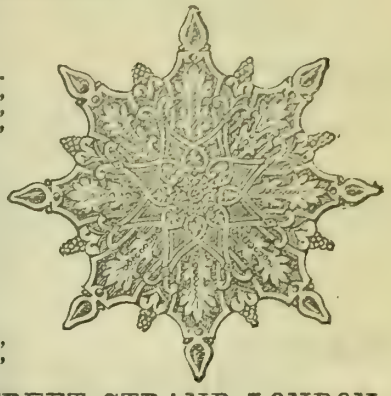

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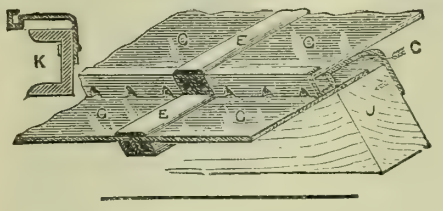

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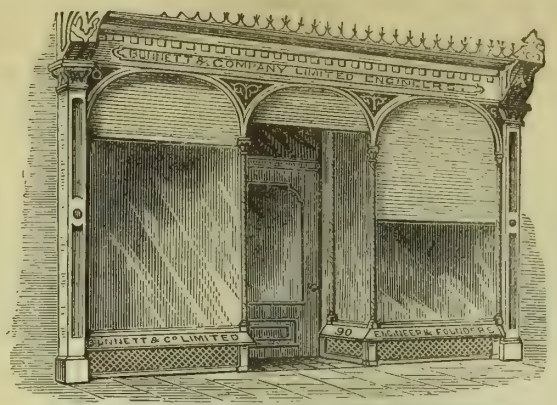

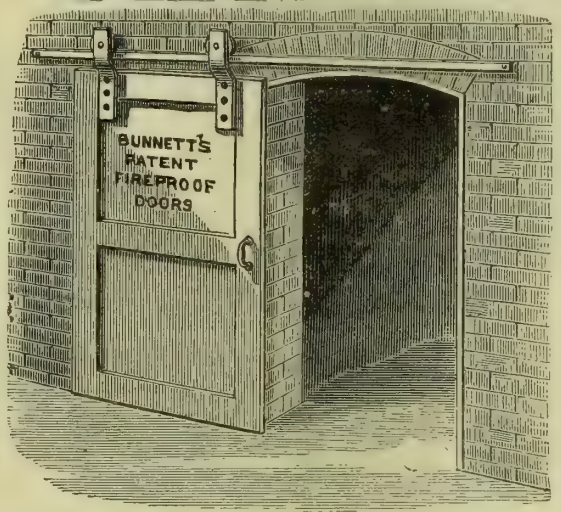

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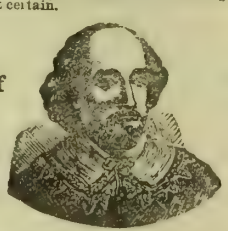

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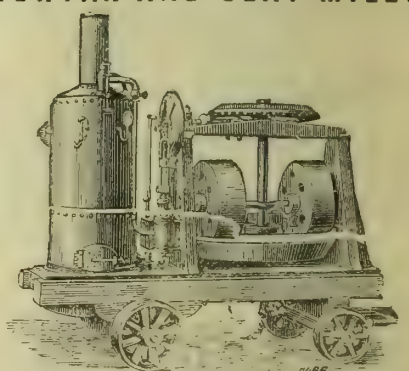

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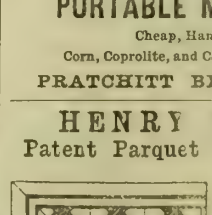

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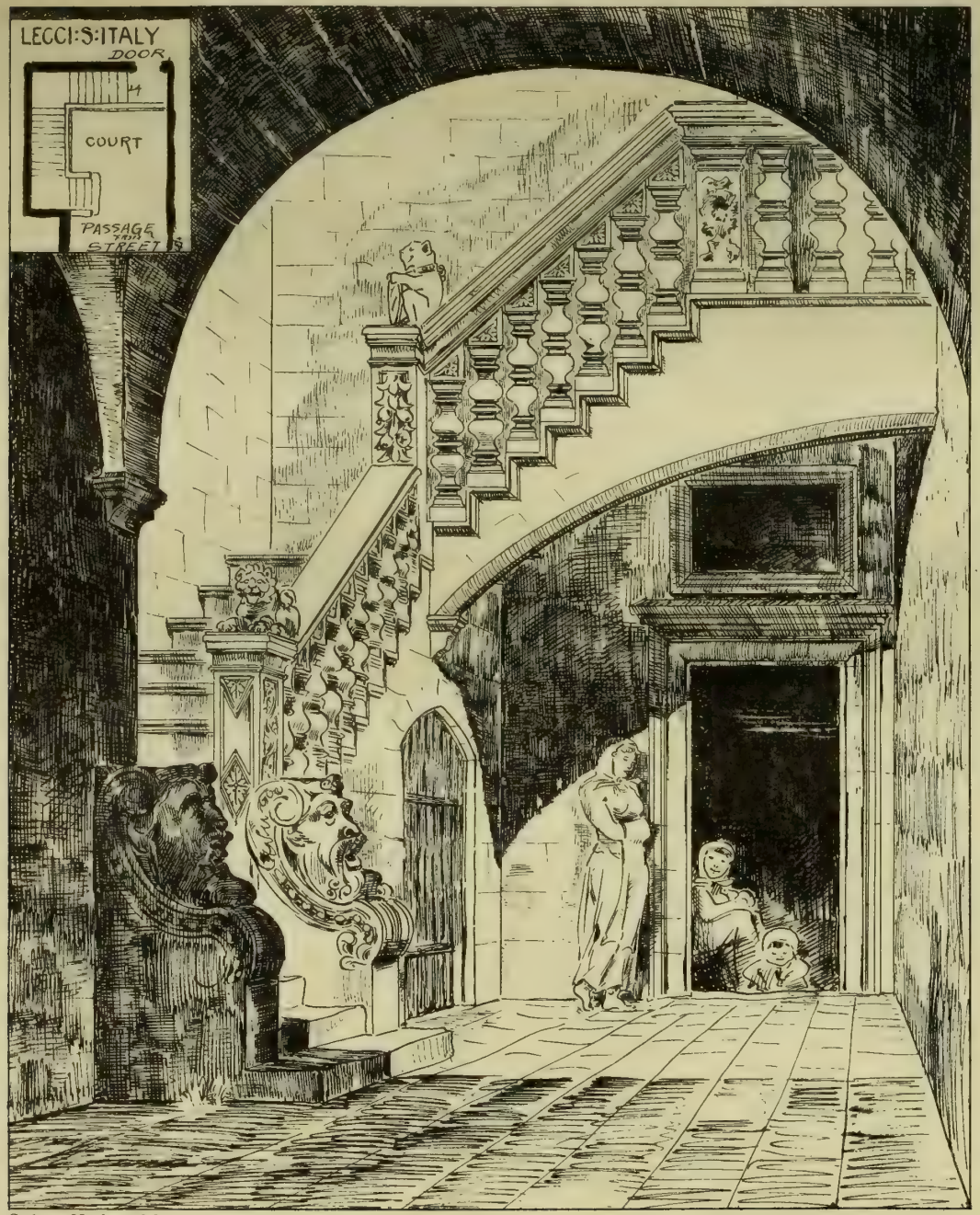

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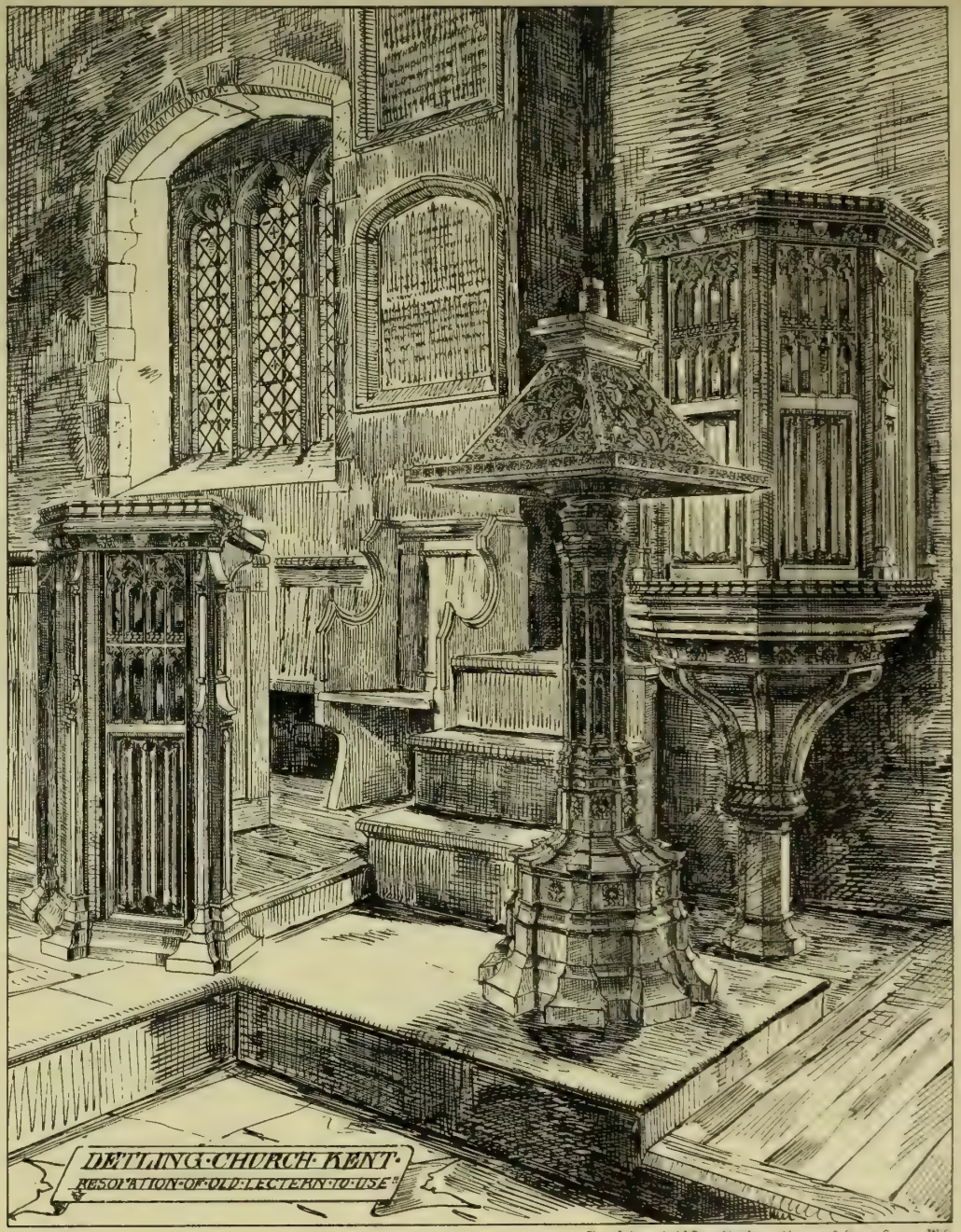

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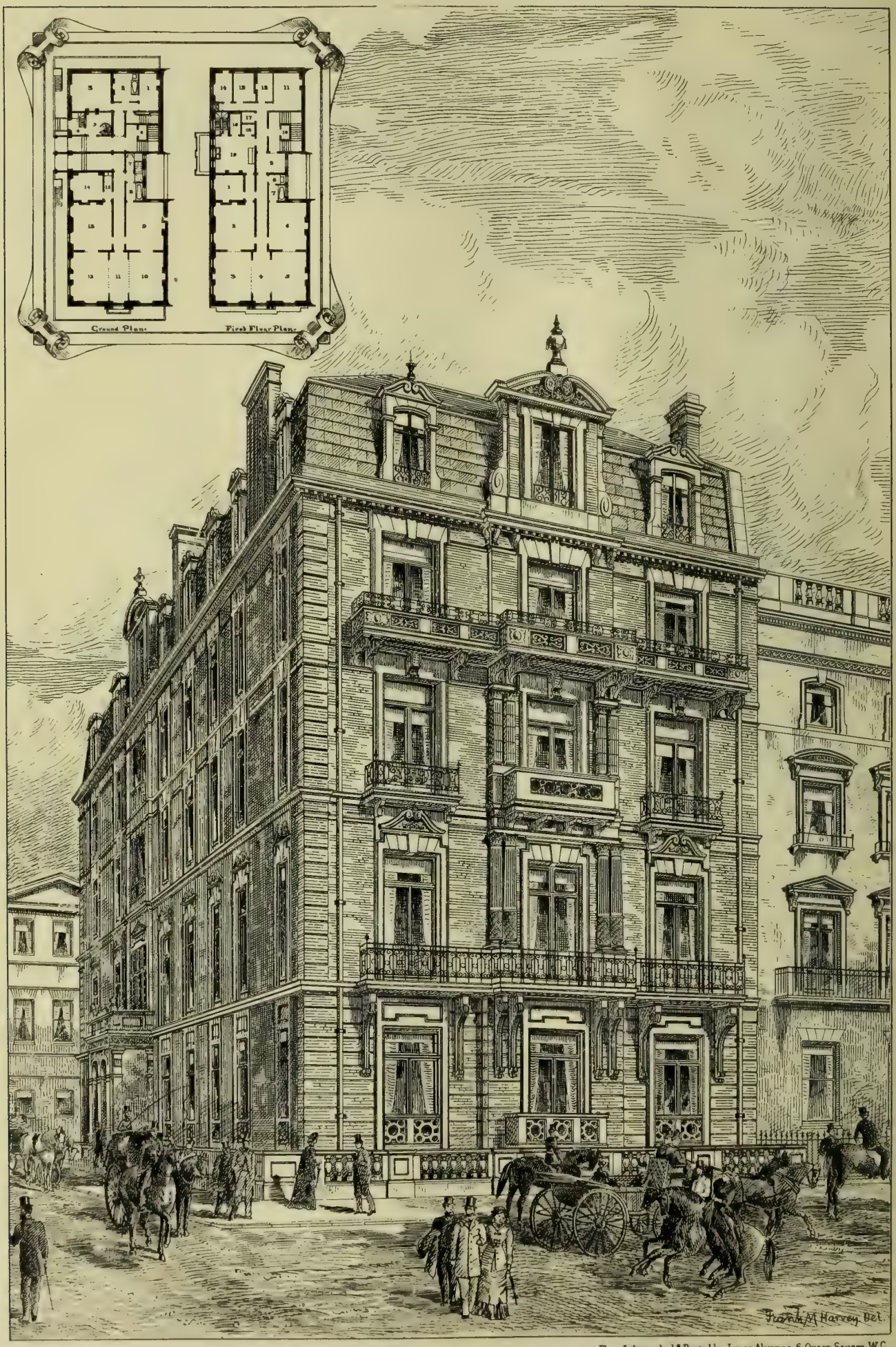

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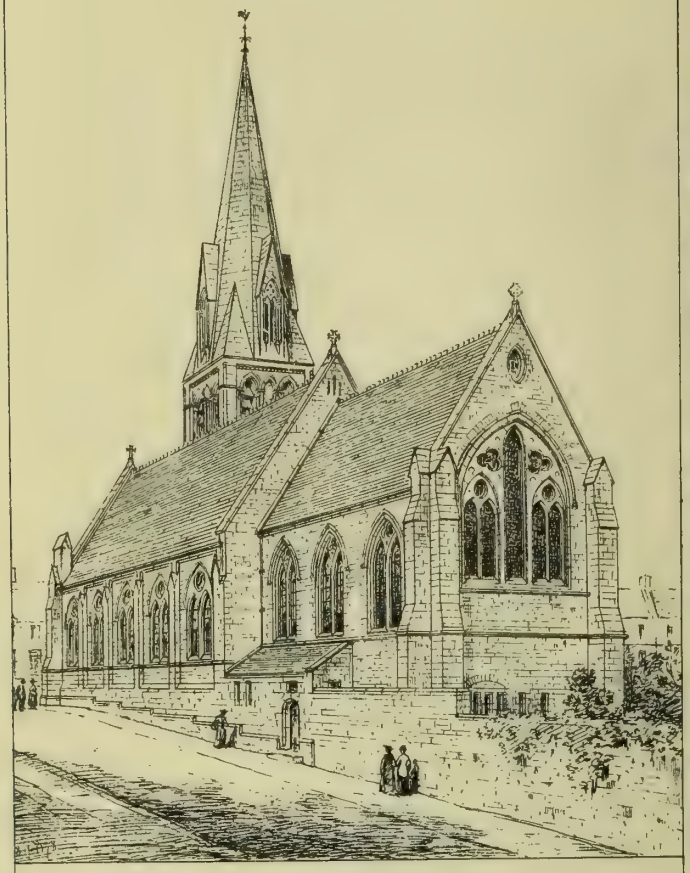

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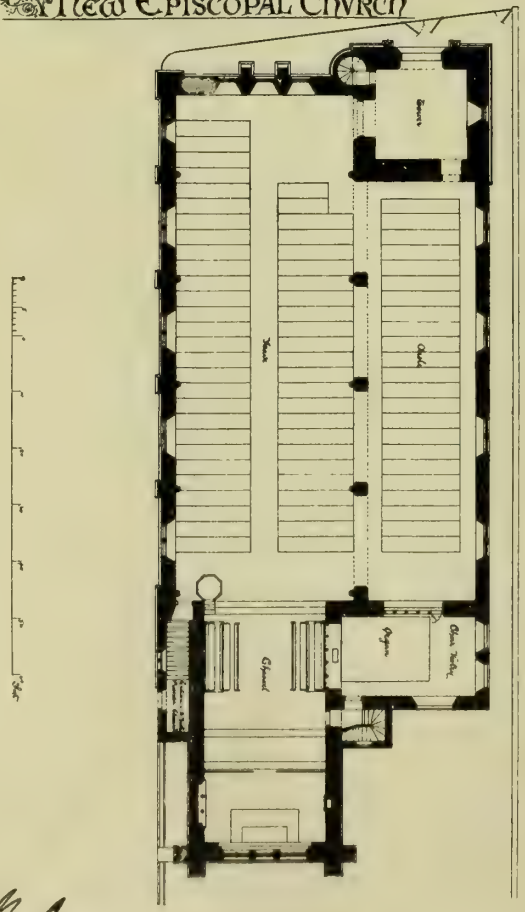

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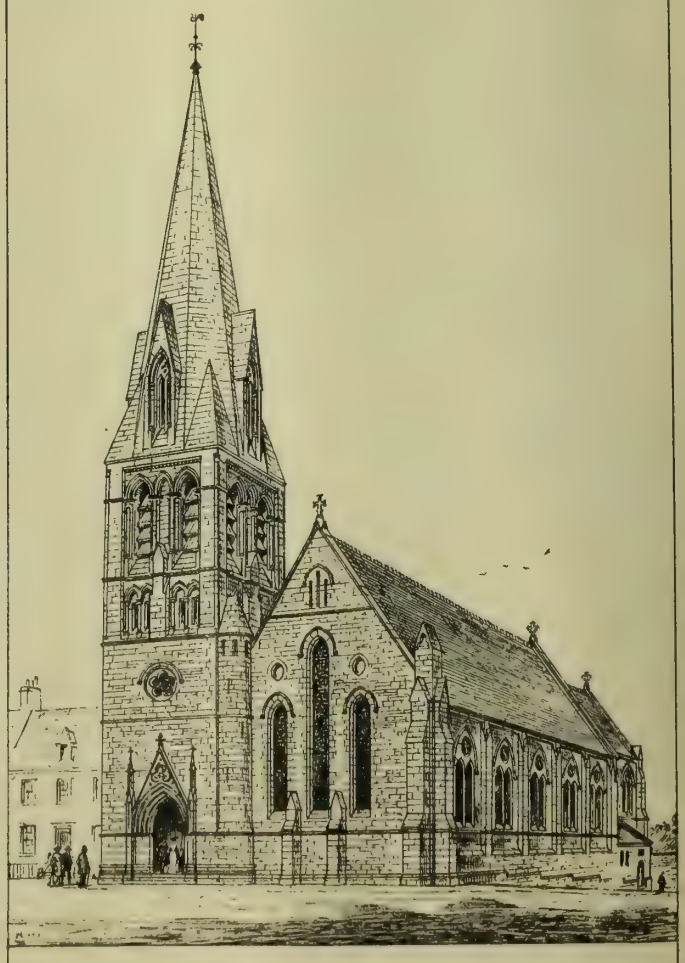

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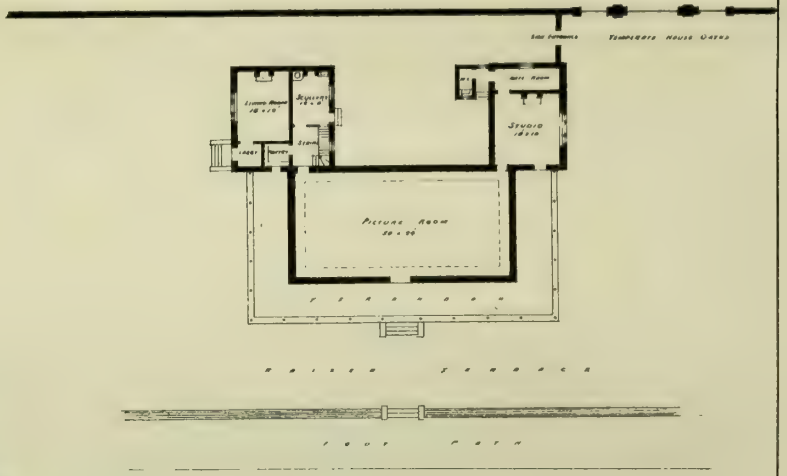

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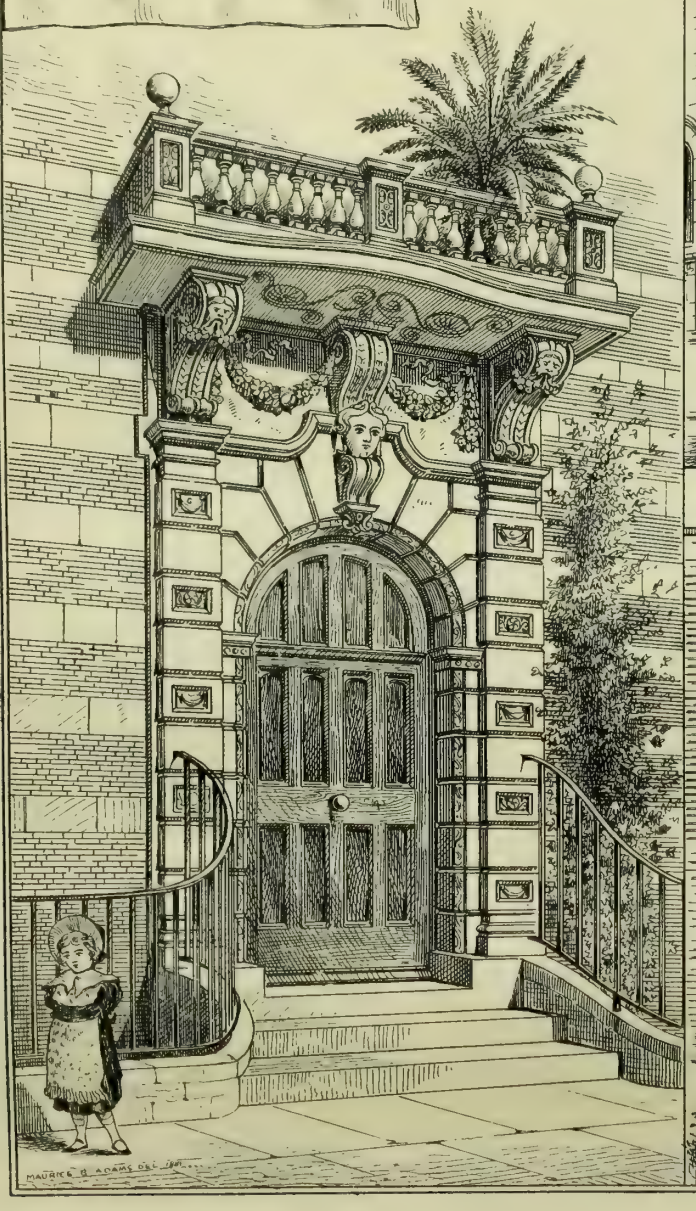

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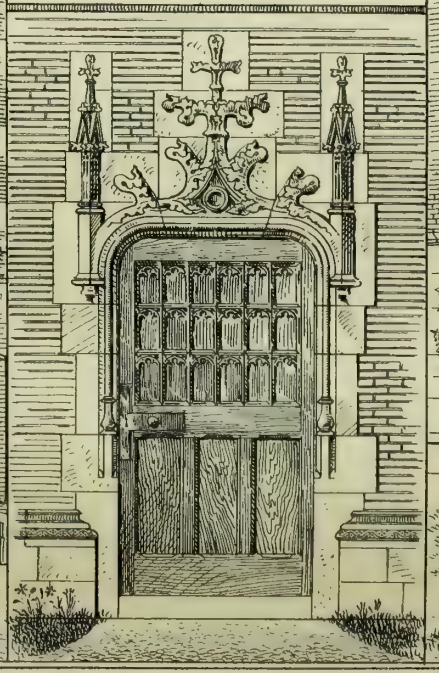

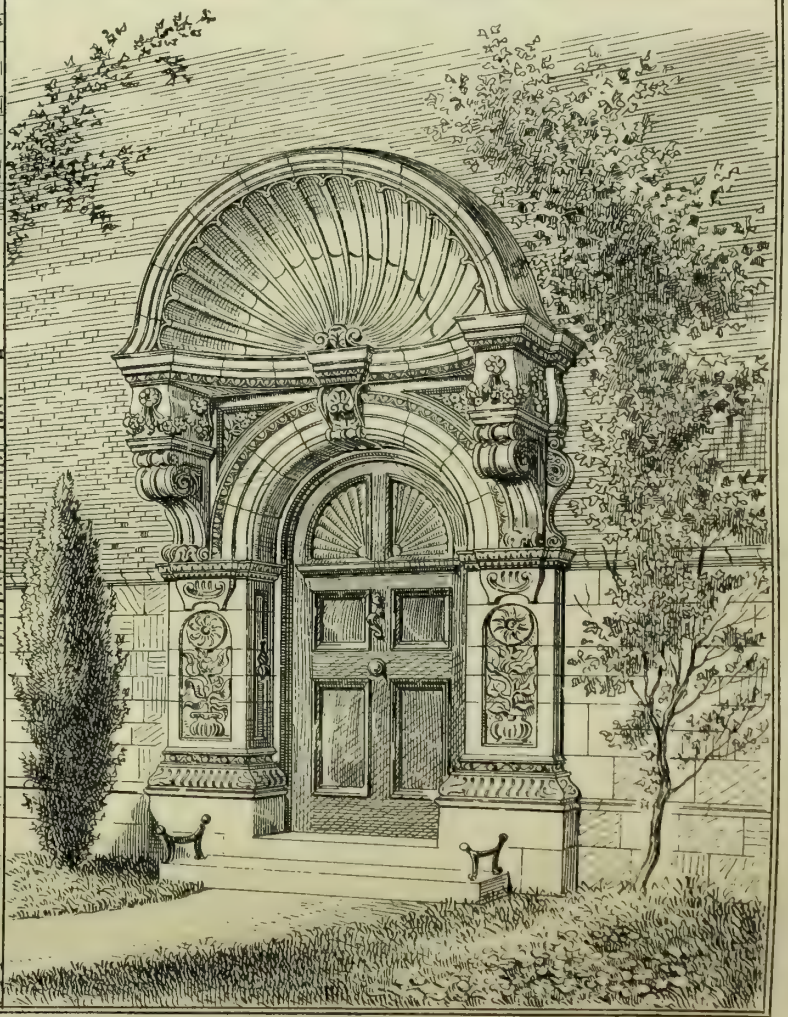

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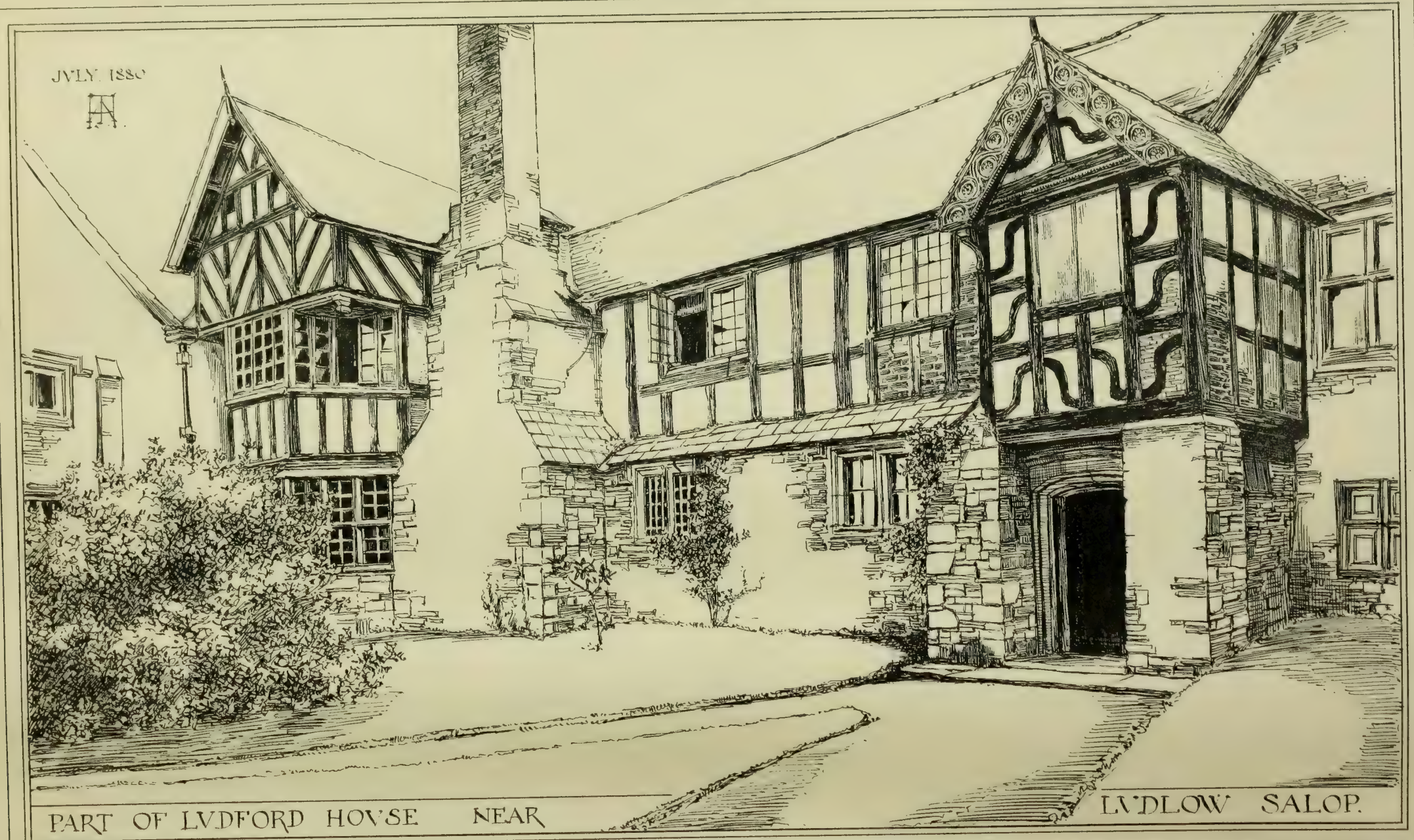

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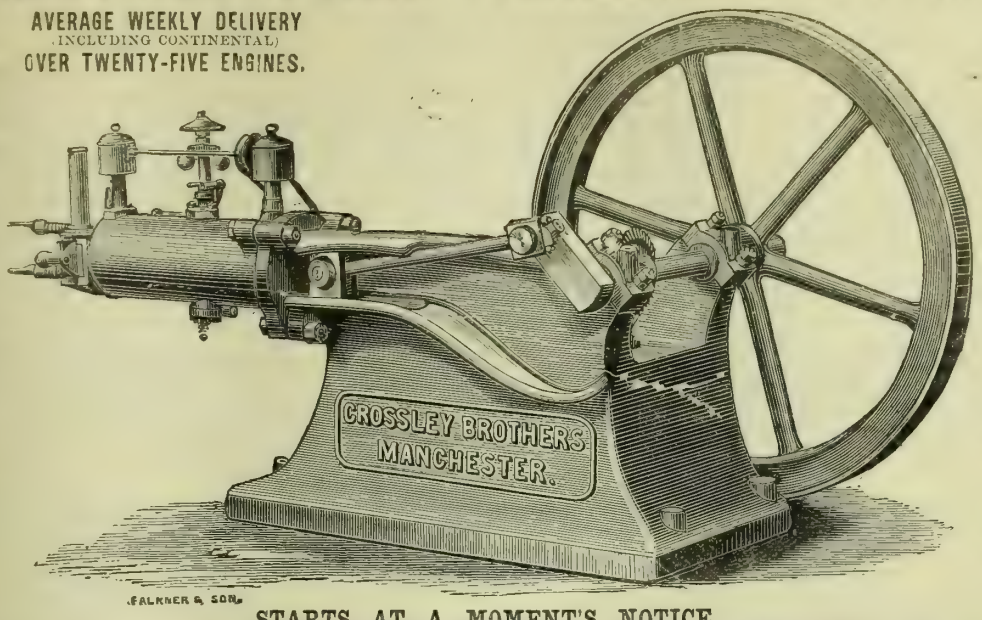

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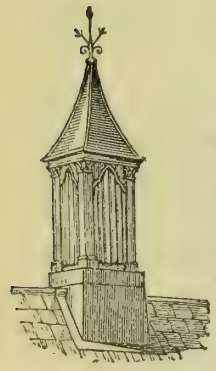

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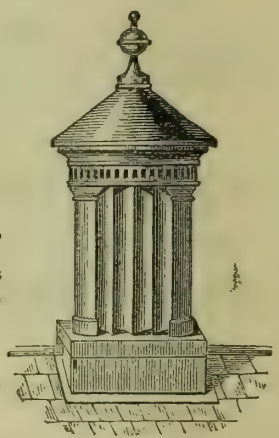

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SETTLEMENTS.*

(*Concluded from p.* 388).

THIS brings me to another part of my subject,—the authority of an architect to order extras. Under the terms of the contract with the builder he is generally entitled to order them, and one rarely sees a contract in which his powers in this direction are expressly limited. I have seen a contract containing a clause to the effect that the signature of the proprietor was to be a necessary addition to all orders for extras; but I happen to know that it became a dead letter as the works comprised in the contract went on, and therefore in this instance it cannot, perhaps, be said to have been fairly tested. There is no need for me to refer to decided cases bearing on this point, because they are so readily accessible to any one who cares to peruse published works bearing on the question. Perhaps the most recent, and, at the the same time, the best, of such works is Mr. Jenkins's little "Legal Handbook for Architects," published seven or eight years ago. I think every young architect ought to study it. Probably most of us have done so; but I will venture to quote Mr. Jenkins on the point in question. He says,—"Should the extras be ordered by the architect, it must be proved that he was authorised by the employer." But he goes on to say,—"It will be sufficient to prove that he was impliedly authorised." An implied authority does not sound like a very difficult matter to establish. Quoting the same authority, I will here point out that orders for extras should not be retrospective. "The want of a previous order will not be supplied by one given subsequently to performance"; and also that the verbal order of the employer himself is insufficient to establish a claim for extras. In the conditions of contract issued by the Royal Institute of British Architects there is the usual clause as to ordering extras in writing, but with the modification that "any plan or drawing expressly given and signed or initialled by the architect as an extra or variation" shall have equal force. And this seems fair enough up to a certain point. But is it quite fair to put the onus of discovering the discrepancies between detail and contract drawings upon the builder? This seems to me a subject for discussion. If all the chief detail drawings of the work can be made before the contract is signed, then the task of checking and comparing any subsequent drawings on their arrival might not be very heavy. But where, as is often the case, the detail drawings are called into existence as the work goes on, how can the builder be expected to say by mere inspection whether they contain more than was included in his contract or not? It seems to me that in the latter case, at any rate, such a clause as this, if inserted, should be very tenderly used. In adjusting contracts where a clerk of works has been employed, one often notices a tendency on the part of the builder's agents to fix on him the responsibility of the extras, or a good many of them. No doubt, in many cases there would be very little harm in giving a clerk of works a certain discretionary power of ordering variations in construction which may be rendered necessary by some unforeseen circumstances, and which must be promptly dealt with. But where any such power is given, there is, of course, just a possibility of weakening the power to exclude unjust claims at the settlement. When the work comprised in the contract is finished comes the question whether the account shall be prepared jointly by the architect (or his surveyor) and the builder, or whether the latter shall send it in for the approval of the former. I think that in most cases the jointly prepared document leads to least difference of opinion. However honestly the builder or his agents may have intended to frame the account, their unassisted knowledge of the variations is seldom sufficient to enable them to render one which shall be quite free from criticism; and we all know how much more unpleasant it is to strike out than to prevent a claim. But architects, although, perhaps, expected by their clients to possess an equal taste for art and science, are very seldom good at both. I think that if Charles Dickens had known a little more of the inner workings of the profession he would have managed to say in his well-known ode to a member of it that he was "Architect, artist, *accountant*, and man." On the other hand, he would have been sure to have made capital sport of Mr. Pecksniff with a five-foot rod and a heavy bill of extras: so the eulogy would have been a good deal qualified, after all.

So far I have assumed that the settlement is to be a friendly one. It is hardly necessary to say much about settlements of a less pleasant complexion. The matter quickly leaves the architect's hands. The arbitration clause comes into operation, and where there is any great display of obstinacy on either side it saves a great deal of trouble no doubt. Unfortunately, the eminent members of the profession who are wont to be appointed as umpires, are often well qualified for the position in all respects save that of a knowledge of accounts. If the case be large enough to justify calling in a surveyor assessor to sit with the umpire and to deal with the measurements and prices, no harm is done. There is something in a name,—and although by any other name "extras" are no cheaper, I think some of the sting is removed by calling them "additional works." I note that the Institute conditions adopt this phrase, and there is certainly less of a suggestion of spontaneous growth in the term "additional works" than there is in the other word. The one phrase seems to imply that the client ordered more to be done, the other suggests that the architect "let him in":—the word may be good enough, but this is the meaning which it has to a great extent acquired.

I shall be leaving a very important part of my subject untouched unless I say something about the valuation of the variations, always supposing that the necessary steps have been taken to settle the extent of them. The schedule referred to in the Institute Conditions of Contract is supposed to govern the valuation, and this schedule is, as we know, in the majority of cases a copy of the builder's detailed estimate. The use of it presents little difficulty, if the user cultivates that judicial impartiality to which it should be his ambition (as it is by practice in his power) to attain. But where there is no such schedule the difficulty is sometimes very great. I often wonder why the ordinary published price-books do not take a little more trouble to keep pace with the times. Perhaps it is beyond their power; the differences of locality and the rapid fluctuations of markets must render it very difficult. Still, I think that a good deal might be done, and that if a trustworthy, not-too-elaborate price-book were published in London and in the provinces (just as the Post-Office Directories are), giving the prime-cost rates of builders' work in the several localities, it would be extremely useful. I fear I cannot say to what extent such a venture would be profitable. One result of such a publication would be a great assimilation of modes of measurement,—a very desirable reform. More work would be let on schedule, insuring perhaps better work, because it would be done with a certainty that it was not being done at a loss; and the little country builder, very good at his work, but very weak in his estimating, would perhaps be able to realise that modest fortune which, under the present system of tendering, seems only too certain to evade his grasp. Perhaps at some future day our Architectural Association and its allied societies throughout the country will be able to do something towards collecting information of the kind. I spoke of the schedule referred to in the Institute conditions. In this particular (as in some others which it is not within my province to mention here) the conditions are a little weak. They do not clearly say that the bills of quantities are the schedule, although we know that where quantities have been supplied they generally do form it. The question of the cost of measuring variations is, perhaps, one which fairly comes within the limit of my paper. Where an outside surveyor has been employed, his fees, as we all know, are generally added to the extras, and, as we probably all also know, would be the subject of much indignation on the part of some clients if they knew they were paying them. This is very unreasonable and unfortunate. I hope the day will come when the position of the measuring surveyor will be more clearly defined with us, as I believe it is in Scotland and on the Continent, and that there will be no mystery whatever about the matter.

Settlements in those parts of the country where the sub-letting of the various trades is the rule, are perhaps the most tedious and troublesome of any. With five or six different sub-contractors to meet, it may be well imagined that there is room for occasional controversy. The rule with some architects is, I know, to deal only with the contractor-in-chief, and to leave him to settle with the rest. Probably this course is the easier; although in practice I admit that I have generally followed the other. There is certainly an advantage in going over the work of each trade with the man who is a perfect master of that trade. One is pretty sure to get some practical wrinkle in the course of the interview which quite compensates for the additional trouble involved. In passing, I may, perhaps, observe that for districts where work is thus sub-let, the conditions of the contract require to be modified as regards the sub-letting clause ordinarily inserted for London jobs. Not only should the sub-letting be recognised, but the architect should reserve some sort of right of approving the sub-contractors, if he means to have the work properly done. A good system of settlement (but one not always practicable) is to agree not only as to what are extras, but as to what is their value, as the work proceed. One hears and knows of cases where this has been done, and where, of course, much trouble has been saved; and it certainly sounds like the simplest thing in the world. But supposing you cannot agree? There is then nothing for it but to fall back upon the old system. Of course, the arbitrator could be called in, but that would be too ludicrous. You could not have an arbitration once a week.

It may occur to you that I have omitted to abuse the builder, and to quote him as the creator of extras. I can only say that the omission is intentional. One can but speak from one's own experience, and mine may be of the more fortunate sort; but I have not found that contractors, as a rule, desire to create extras. When a contract is taken, the builder, if he be a man of any method at all, and in a fairly large way, of course makes his arrangements for certain supplies of materials and labour, all of which arrangements are apt to be upset if there be any material alteration in the intended works. It is not necessarily to his interest to have any such disturbance.

There is one sort of settlement quite free from extras. Under such a system as that to which I just now referred (building by schedule), there would, in a certain sense, be no extras, and there would be one bugbear the less to worry the architect. I do not know how far the Scotch or French architects, who build by schedule, may suffer from the difficulty in question. In both those countries the work is, as we know, measured and valued on a schedule. In Scotland, and, I presume, in France, some kind of estimate is given. But, where it is understood that all is to be measured at the finish, I do not see how the absolute total cost can be calculated beforehand. No doubt, it is understood that it is approximate. Speaking to a French architect on the question of the cost of work, a short time ago, he assured me that, in his own individual practice (and he has a large one), a client was always very meek and manageable on this score, and "he lends me his purse," was the expression which he used, in order to convey the idea of his complete docility. A beautiful and resigned spirit, quite unusual among English clients, so far as my experience carries me.

A very familiar form of extra is that which arises from the weakness of sub-contracts. The chief contract embraces, perhaps, a number of provisions as to gas-fitting, hot-water work, sculpture, stained glass, and other decorations. You make sub-contracts with various tradesmen or artists. At the close of the job you find that you were not quite so careful in the clauses of your specifications for these sub-contracts as you were with those of the specification-in-chief. What I say may sound superfluous, but I have a good many accounts to deal with, and I get only too much evidence that it is not. There is sure to be a loophole for an extra in some of these items. The gasfitters have required and received such an amount of attention from the carpenters that you could almost believe that they had been lady gasfitters! The hot-water man wants you to find him all the materials for setting his boilers and building his flues, and often all the labour too; but he was not nearly so emphatic about these requirements before signing his contract. You ought, perhaps, to have understood him more clearly. I

* A paper read before the Architectural Association by L. C. Riddett on the 1st inst.

do not say it was his fault. The other people scorn to bring so much as a step-ladder on to the premises, and proceed to use the plant belonging to the builder, who, instead of carting away his scaffold-poles and cords and planks, practically invests them at a good rate of interest, charging so well for the hire of them that you might almost expect the "plant" to fructify in its unexpected state of prosperity. The carver has no scaffolding, and you must not only find it for him (unless you bargained otherwise), but must shift it about to suit him. I do not say that any of these claims are fictitious or unjust. I merely remark you should guard against them.

A cause—though a less frequent cause—of extras is the old "p.c." difficulty. You provide your little sums of money for locks and latches, for stoves and chimney-pieces, but you have omitted to say that the amounts did not include the builder's profit. You are not too busy, perhaps, to go about and order these things yourself. When you get the bill you tell your builder to pay it, and he does so; but if he find the merchants deaf to his appeals for discounts he fairly enough charges your client with a profit. You cannot, because you had omitted to put the letters "p.c." after the sums provided, or to arrange that he should have a discount. This, again, is a most elementary piece of instruction, and I am almost ashamed to introduce it, but I know it is a caution much required by those who have not had experience in difficulties of the sort.

Another cause of extras in connection with the prime-cost difficulty occurs to me. The preventive is simple enough; but the difficulty often arises. Your client being anxious to choose his grates or tiles, or some similar little matters, all provided in the contract, but in the selection of which you give him discretionary power, asks you to take him round to the head-quarters of the dealers in such things. The merchant supplies the goods, and invoices them to your client or to yourself, and does not press anybody for the money. The account has been delivered to you, but you have sent it on to your builder to pay. Circumstances over which he has no control, or at any rate you have not, prevent him from paying it at once. The same circumstances, however, induce a rather speedy winding-up of the contract accounts, and you give your builder a certificate for his balance, quite unconscious of the fact that the goods remain unpaid for. "Circumstances" again assert themselves in a way unpropitious to your late contractor, who liquidates, and starts again, regenerate and ready for fresh troubles. You are a little surprised to find the merchant so calm and unmoved. Having just settled down to admire this good man struggling—one might almost say, satisfied—with adversity, you are further surprised by the delivery of his account, made out to you or to your client. The disturbing effect of this upon your recent settlement is easy to imagine. The preventive is equally easy. Take care another time that the order to the merchant comes through the contractor.

The grandest safeguard against extras is, of course, the "money provision," to be expended as directed. I think the builder generally is directed to expend it. In contracts of a heavy sort for public bodies who are perhaps borrowing the amount which they propose to spend, and who perhaps cannot afterwards enlarge their borrowing powers, ten per cent. would be a prudent provision. With an ordinary client, I think that a sum of at least five per cent. on the amount of the contract should be thus placed at the discretion of the architect. And it is all the better for the client if he does not know the extent of the provision. However perfect may be your confidence in your client, or his in you, I do not believe that he can, as a rule, be safely trusted with a money provision. He will spend it three or four times over.

One word with reference to omissions. Some system of booking omissions at least as clearly as the extras are recorded is much to be desired. No doubt the young architect with one job will be pretty clear as to his omissions; but when work gets more plentiful, and particularly when it happens to spread over a long term, he is very likely to forget a few of them. Most architects have, I fear, a kind of horror of bookkeeping; but a certain amount of it is a necessity, and will save much time in the end. At any rate, a little debtor and creditor account might be kept against the "provisional" items, by which could be seen at a glance how you were getting on, and when to enforce severe economy with reference to these. Many an unpleasant surprise at the finish would be spared by even this little exercise of commercial intelligence.

DINNER OF THE BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

About 120 friends and supporters of this Institution met at dinner on Thursday evening in last week, at the Guildhall Tavern, Gresham-street, E.C., to celebrate the 14th anniversary. The institution has as its objects, the granting of permanent pensions to the clerks of builders and their widows, and the giving of temporary relief, and also the purchase of presentations to homes for their orphans. This was the third annual dinner, and, like the last one, has shown a marked and gratifying advance on the previous gatherings of a similar kind, alike in the numbers attending it, the interest and spirit manifested in the proceedings, and the amount of money collected. The chair was taken by Mr. Stanley G. Bird, the president, who was supported by more than 120 gentlemen, including many well-known builders and contractors of the metropolis. In giving the toast of the evening, "Success and Continued Success to the Builders' Clerks' Benevolent Institution," the president sketched the history of the institution from its foundation in 1866, showing the large and progressive increase in funds that had been made during the last two years, and appealed to those present to mark the present year by raising £250 for a third presentation to an orphan home. The funds were in a satisfactory condition; there were credit balances of £103 on the relief fund and £48 on the orphan fund, while they had £1,350 invested. The working expenses were exceedingly small. At present they maintained ten pensioners, and two orphans. Donations amounting to £173 6s. and subscriptions of £39 14s. were announced by the secretary, Mr. H. W. Wheatley, making a total of £213, and in response to a challenge from the president to help to bring this to £250, many gentlemen followed his example and increased or doubled their subscriptions, so that at the close of the meeting an additional sum of £47 14s. was announced, making a total for the evening of £260 14s., a notification received with cheers.

CHIPS.

A monument is in course of erection in Wells Cathedral to the memory of the officers and men of the 13th (Prince Albert's) Light Infantry killed in the South African campaign of 1878-9. It is Early English in style, and is of the Doulting stone so generally employed in the cathedral; it is 6ft. 6in. high, and 9ft. long, and contains five panels, four of yellow Marfield stone. That in the centre, which is higher and wider than the others, is occupied by a representation in terra-cotta of David just after he has slain Goliath. The sculptor is Mr. Tinworth, of Messrs. Doulton's, Lambeth; Mr. Edmund B. Ferrey, of Spring Gardens, London, is the architect.

At the Somersetshire quarter sessions, last week, plans were approved for the erection of a detached block for 80 female patients at the asylum, and £8,500 voted towards the cost of building.

The Swansea Harbour trustees, on Monday, increased the salary of Mr. Capper, the harbour superintendent, from £600 to £900 a year.

Mr. Joseph Spicer, at present local-board surveyor, of Staines, was last week elected surveyor of Southend-on-Sea, at a salary of £100 a year.

A stained-glass Markham memorial window is being placed in the parish-church of Melton Mowbray. The work is being done by Messrs. Wailes and Strang, of Newcastle-on-Tyne.

On Saturday week the memorial-stones of a new chapel and schools, which are in course of erection in Earle-street, Crewe, were laid. The chapel will be 54ft. 3in. by 42ft. internally, schoolroom and classroom (on the ground-floor) 51ft. by 21ft., and a similar schoolroom and classroom on the upper floor. The plans also include a minister's vestry, to be erected at a future time. The design is of Gothic character. The buildings have been designed by Mr. G. B. Ford, architect, Burslem, and are being erected by Mr. John Grosvenor, builder, Tunstall, the amount of the contract being £1,703.

The Somersetshire Archæological Society had a conversazione on Monday week at Taunton Castle.

Building Intelligence.

Rock Church, near Bewdley.—The restoration of the tower of this church has just been completed. When it was resolved last summer to take the work in hand it was found to be in a most dangerous condition as regarded the upper portion, and owing to the roof being thoroughly rotten, the wet found its way into the bell framing and floors beneath which were rapidly decaying. It was found necessary to rebuild the upper portion from the top of the belfry windows, put a new lead roof, renew the tracery in several windows, and generally restore where needed down to the ground. The work has been carried out by Mr. Wm. Porter, of Malvern, under the direction of Mr. Martin B. Buckle, A.R.I.B.A.

Edinburgh.—Operations have just been commenced for the erection of a church at the north-west angle of South-Back of Canongate and St. John-street. Messrs. Anderson and Browne, Wemyss-place, are the architects. The plan of the body of the church is T-shaped, the extremity of the long arm being octagonal; and against the angled sides being set circular stairs leading to the galleries, and a porch and vestibule which form the principal entrance. The nave is covered in one span with a hammer-beam roof, and is ceiled with a narrow boarding at the level of the collars. Behind the pulpit, completing the cruciform plan of the church, are an organ and choir gallery, and under a vestry and lavatories. The church will be seated for 875 people, exclusive of the choir, 535 being accommodated in the area, and 340 in the gallery. The estimated cost is £4,000, consequently there are no purely decorative features. The walls will be built of square snecked rubble, with scabbled stone dressings, and the roof covered with plain red tiles. Messrs. Wm. Beattie and Sons are the principal contractors, and Mr. T. Bryning acts as clerk of the works.

Halifax.—Lea Mount Board Schools.—These schools, the sixth built by the Halifax School Board, were opened last week. The site is open and elevated, and a tower having been placed in the centre of the building, the schools are a conspicuous landmark in the district. The style of architecture adopted is a version of Early Pointed, treated somewhat ornamentally, on account of the site adjoining the new Shrogg's Park, now in course of formation by the Halifax Corporation. The ground in front of the schools is ornamentally laid out with shrubbery, &c., the playground being at the back. Covered playsheds are provided, as also a detached caretaker's house, so placed as to command the premises, on account of the district being somewhat lonely. The schools accommodate 650 children, in three departments, and all the rooms enter from a central corridor, except the teachers' rooms to the boys' and girls' departments, which open direct into the large schoolrooms. The architects are Messrs. Leeming and Leeming, of Halifax, Mr. R. F. Bryan acting as clerk of works.

Hanley, Staff.—The fifth school erected by the Hanley School Board was opened on Thursday in last week. The group of buildings are of simple Gothic style, the walling materials being in local red brick, with Hollington stone sparingly used for heads and sills, and the roofs are covered with blue and red plain tiles, in bands, with a cresting and gable finials of terra-cotta. The total accommodation is for 637 places, with main rooms and class-rooms, divided with glazed screens and sliding partitions. There are large inclosed cap and cloak-rooms, with lavatories to each department, and master and mistress' rooms attached. The heating is by Shorland's Manchester school-grates, and a hot-water apparatus, on the small-bore principal, by Messrs. J. King, of Liverpool. The ventilation is provided for by bringing the outer air into the various rooms through large grids in the walls in connection with vertical tubes, and flues to sliding-grids in the window-boards; and foul air is drawn up through openings in ceilings, directly communicating with trunks, fitted with Boyle's air exhaust-pumps, placed in turrets on the apices of the roofs. The cost, including the boundary walls and asphalting, is £4,145. The builder was Mr. John Gallimore, of Newcastle-under-Lyme. The work has been carried out from the designs and under the

superintendence of Mr. U. A. Heates, of Hanley, the board's architect.

Huddersfield.—A new theatre was opened on Monday. The Ramsden-street frontage is of boasted ashlar, and is 60ft. wide, containing six entrances, while the side to Bull and Mouth-street is of hammer-dressed stonework, and is 118ft. wide, and has other entrances. The stage opening is 26ft. wide and 28ft. high, and has two tiers of private boxes on each side. The dress-circle will be furnished with movable seats, will accommodate 120 persons, and has its own refreshment-bar, cloak-room, and lavatory. The upper circles will accommodate 130 persons, and also has separate smoking-room, bar crush-room, and lavatory. The gallery and pit will each seat 1,000 persons. The level of the stage is so arranged that during a performance a carriage and pair can be driven direct from the street on to the stage, thus obviating the provision of stabling within the building. The pit seats and upper circles are provided with a hat-rail. Mr. B. E. Entwhistle is the architect, and Mr. J. A. Love, Southport, the contractor; the decorations are by Messrs. Hughes and Watterson, of Liverpool.

Hull.—The foundation-stone of the new church of St. Thomas, Campbell-street, was laid on the 6th inst. The building, which is of red brick with a very sparing use of stone, consists of nave with north and south aisles, north porch, north and south double transepts, apsidal-ended chancel, with organ chamber and vestries on south side, and bell-turret on north side of chancel. Beneath vestries is the heating-chamber. The aisles are unusually low and narrow, and the clerestory higher than is common, it being necessary on account of surrounding buildings to effect the entire lighting of the nave by the clerestory and west windows. The transepts show externally as coupled gables, having couplet lancets, and above these cusped circular windows. At the junction of chancel and transepts rises to a height of 90ft. a slender octagonal bell-turret, with slated spire. The roofs are open-timbered, of good pitch, and divided into panels by wrought, stained, and varnished arched principals and wrought purlins. The seating is of wrought, stained, and varnished deal, with ornamental ends. The dimensions are: Nave, 80ft. by 34ft., with a height of about 58ft. to apex of roof; north and south aisles, 51ft. by 8ft. wide; transepts, 25ft. by 16ft.; and chancel, 19ft. by 22ft. by a h6ight of about 50ft. to apex of wood-panelled ceiling. The architect is Mr. Edward Sampson, of Tyrell-street, Bradford, and the works are being carried out by Messrs. Simpson and Malone, of Great Thornton-street, Hull.

Salisbury.—The beautiful and unique refectory in New Canal-street, known as "Ye Halle of John Halle," has just been carefully restored, under the superintendence of Mr. Fred. Bath, A.R.I.B.A., of Crown-chambers, Salisbury. This banqueting-hall was erected between 1467 and 1484 by one John Halle, and prior to 1834 was divided and subdivided into many small rooms; but in that year the then owner, Mr. Sampson Payne, had it restored to its original proportions. It is remarkable for its rich windows, its elaborately-carved screen, its antique chimney-piece, and massive and boldly-corbelled roof. Mr. Bath has designed and carried out a new street-front to the hall, of well-seasoned oak framework with *sgraffito* plastering; in the lower part are shop-fronts, entirely of carved oak, with plate-glass windows, and over this is carried on carved corbels a projecting story; a second story projects yet further and is crowned by a steep gable having ornate barge-boards. The carving, including figures of John Halle and King Edward IV., and the sgraffito work have been carried out by Mr. Harry Hems, of Exeter. The general contract was undertaken by Mr. John Wort, builder, of Park Works, Salisbury.

Salisbury Diocesan Church Building Association.—At the adjourned annual meeting, held at the Boardroom in the Close, on Tuesday week, the following resolutions were passed:—That the vacant post of architect to the society be not filled up. That when a survey or report upon a church be desired by those who are interested in its restoration, it be lawful for them to call in any architect approved by the General Committee (instead of, as heretofore, the honorary diocesan architect) towards whose fee the society would undertake to contribute £3 3s., should he not be eventually employed as the architect. That, in the event of the General Committee requiring a report upon any plans submitted to them, they may obtain the opinion of any eminent architect, and give a fee not exceeding £3 3s. from the funds of the society. That these rules be submitted to the next quarterly meeting. At the conclusion of the annual meeting the usual quarterly meeting was held, when the grant of £60 for Broad Hinton, Wilts, was ordered to be paid, the works being completed; and a grant of £30 was made to Christchurch, Warminster, Wilts, all the seats of which are proposed to be free and unappropriated.

Sheffield.—The Church portion of the new cemetery in Intake-road was consecrated on the 28th ult. The cemetery contains 50 acres, and has entrances from the Intake road and Manor-lane. The former, the principal entrance, is under a gateway, with stone vaulted ceiling, and wrought-iron gates, surmounted by a tower. Above the gateway is a residence for an under-sexton, and the clock-chamber and cistern-room occupy the top story. On one side of this gateway are the board offices, with general office, fireproof muniment room, and superintendent's house, approached by cloisters from the gateway, and on the other side is the residence of head-sexton, with workyard and offices. In the centre of the grounds are two two chapels, similar in general plan and arrangement, but slightly varied in design. They are each 75ft. by 24ft., each having a mortuary aisle 37ft. by 15ft., separated from the chapel by a glazed stone screen. They have also a vestry with lavatory, &c. The roofs are panelled in pitch-pine; the passages are of encaustic tiles, and the seats, which are open benches, stand on a wood pavement. The chapels are warmed and ventilated on Haden's system. The floors of mortuaries are of cement concrete. The third chapel—that for the Roman Catholics—has not yet been erected. The cemetery is surrounded by a wall 7ft. high. The materials of the buildings are externally Worrall wallstone, hammer-dressed, with Hollington stone dressings, the roofs being covered with Westmoreland green slating; and the design is founded on the local architecture of the Tudor period. The site was purchased at a cost of £13,625, and the buildings, roads, &c., have cost about £25,000. The works were commenced in the autumn of 1878, and have been carried out from the designs and under the superintendence of Messrs. M. E. Hadfield and Son. Mr. Geo. Webster has acted as clerk of works, and Messrs. Ridal and Arnison have been the general contractors. Mr. W. S. Gilman has executed the stone-carving; the fittings and furniture have been executed by Mr. Ray and Messrs. Appleyard; and Messrs. Hardman and Co., of Birmingham, have made the entrance gates and ornamental ironwork.

Sunderland.—The first stone of new Sunday-schools in connection with the Congregational Church, Fawcett-street, will be laid on Tuesday next. The plan is not the usual rectangle, but is eight sides of a twelve-sided figure, and will form the apsidal termination of a church to be built hereafter. The outer part of figure is capable of being shut off into eight class-rooms by revolving wooden shutters, the inter-divisions being by the same means. Accommodation is found for 600. The upper class-rooms form a continuation of the aisle of the church, with roofs of the usual flat pitch, and the central drum (which is supported by iron pillars, in which the shutters work) is a continuation of the nave of the church, with a steep roof, having dormer windows. The walls are faced with stone, and all the joiner's work is in pitch-line. The warming is by hot water-pipes, so arranged that the central part can be warmed for week-night lectures, independently of the class-rooms. The contracts amount to about £2,200, including warming and ventilating. Mr. J. P. Pritchett, of High-row, Darlington, is architect.

At the annual meeting of the Durham Diocesan Church Building Society, held on Thursday in last week, the following grants were made:—Tynemouth, new church, £100; Castle Eden, new church, £80; Shildon Church restoration, £50; St. Andrew's Church restoration, £50; Ayliffe Church restoration, £50; Washington Church restoration, £40; and Chevington Church, £10.

COMPETITIONS.

Haltwhistle.—A new Wesleyan chapel is about to be erected, from the designs of Mr. James Murchie, of Carlisle, whose plans were selected in competition with Messrs. Smith and Son, of Shotley Bridge, Messrs. Hetherington and Oliver, of Carlisle, Mr. Race, of Weardale, and Mr. Heslop, of Haltwhistle.

Newbury Drainage.—The town council have awarded the first premium, £100, to Mr. H. O. Baldry, and the second premium, £50, to Messrs. Gotto and Beesley. There were 27 competitors, and the council acted on the advice of Messrs. Law and Chatterton, civil engineers, in awarding the premiums.

Pontefract.—At a meeting of the Pontefract Town Council held on Wednesday week, the question of erecting a suitable structure in the Corn-market for the use of buyers and sellers of grain was discussed, and a resolution ordering the borough surveyor to prepare plans was passed. The Streets and Highways Committee recommended that in future no work be ordered by the borough surveyor unless sanctioned by the committee. The Council were empowered to advertise for carrying out the works of sewerage on the specifications having been examined relative to the outfall works. It was resolved that the services of Messrs. Perkin and Bulmer, architects, be retained for carrying out the new town-hall scheme, and that £50 be paid them for the best plans, awarded in their favour.

Suffolk Lunatic Asylum, Melton.—At the Suffolk quarter sessions, held at Ipswich on Thursday, a report was received from the asylum committee stating that advertisements had been inserted in the Building News and two other London journals, and the local newspapers, inviting architects to send in plans and estimates for a new block of buildings at the asylum, Melton, near Woodbridge, for 150 patients. "In response thereto ten sets of plans were submitted to your committee for their inspection, and after very careful consideration of the several plans and the estimated cost of each, they recommend the Court to adopt (subject to the approval of the Secretary of State) the plans marked 'C' (with a story above the proposed new male block, instead of the proposed addition to old buildings on the female side), prepared by Messrs. Giles and Gough, architects, London, which they estimate can be carried out for about £11,650." The plans of Messrs. Giles and Gough were upon the table. Their chief feature was that the extra accommodation required will be obtained by alterations and additions to the existing buildings, instead of erecting a new detached block of buildings. The present kitchen in the centre of the building it is proposed to enlarge by taking in a portion of the present female yard, and to build over the kitchen a dining and recreation hall. It is proposed to add a new block with two floors to the north-east of an existing one-story ward on the female side, which will give 40 beds on each floor, and to add a story to an existing ward, giving 30 beds. On the male side it is proposed to add a one-story ward, giving accommodation for 40 males. Lord Rendlesham stated that Mr. Fulton, C.E., of Great George-street, Westminster, formerly engineer to the Bedford Level, had reported on the plans. Messrs. Giles and Gough were architects of the Kent Second County Asylum for 900 patients, Gloucester Second County Asylum for 800 patients, Abergavenny Joint Counties Asylum, additions (250 patients), Carmarthen Joint Counties Asylum, additions and infectious hospital for 110 patients, Leavesden Metropolitan Imbecile Asylum for 2,000 patients, Caterham Imbecile Asylum, &c. He moved that the report be received and adopted, and that the plans be approved, with the addition of a story to the new block on the male side, instead of the proposed second story to the old building on the female side. This was carried, an amendment, by which the visiting justices were instructed to carry out the selected plans as prepared, being withdrawn.

We are glad to hear that Mr. William Burges, A.R.A., who has been very seriously ill during the last week, is progressing favourably.

The corner-stone of a misssion-room for the parish of St. John the Baptist, Chester, was laid on the 7th inst. Mr. T. M. Lockwood, of Chester, is the architect, and Mr. T. Hughes, of Aldford, the contractor.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

British Archæological Association.—The ninth meeting of the session was held on Wednesday week, Mr. T. Morgan, F.S.A., in the chair. It was announced that the annual Congress would be held in the autumn at Great Malvern, when visits would be paid to various places of interest in the neighbourhood, including Ledbury and Kidderminster, and perhaps Hereford and Worcester. The discovery of a large number of ancient British remains at Kingston-hill was reported, and a series of the articles found was exhibited by Mr. H. Clutton. These consist of hand-made "food vessels," as the small urns found in early graves have been designated, and one of these still contained grains of blackened corn. Various other earthenware articles were among those exhibited, and also several masses of bronze ready for manufacture, a mould, and some bronze implements. These relics point to the existence not only of a burial-place, but to the presence of the living, and afford evidence, perhaps, of the people who constructed the so-called Cæsar's Camp on Wimbledon-common, recently so wantonly destroyed. The position of the discovery is at the junction of Combe-lane with the Kingston-road, at the gravel-pits on the estate of H.R.H. the Duke of Cambridge. A lengthy discussion followed, and Mr. G. R. Wright, F.S.A., pointed out that these were probably the first relics found near Wimbledon-common. Mr. Cecil Brent, F.S.A., read a short paper on a remarkable pack of playing-cards, which he had discovered pasted into the covers of a book printed in 1559 at Nuremberg. They are probably Venetian, and one bears the date of 1558. Mr. Loftus Brock, F.S.A., exhibited some curious iron and bronze articles of early date, recently found in the Farringdon-road. Mr. W. de Gray Birch, F.R.S.L., reported the discovery of a fifteenth-century watering-pot, found at Messrs. Waterlow's premises, Westminster, 10ft. below the modern surface. The chairman read a paper on the Roman Mosaics of the Villa at Brading, I.W., and suggested that the enigmatical "cock" pavement in reality represented emblematically the four periods of the day. Mr. G. Lambert, F.S.A., spoke of the enormous extent of the remains, which are known to go fully quarter of a mile from the pavements, while there are evidences that there was a small harbour and landing-place at Yalverland. An elaborate paper was then read on the Early Norman Cathedral of Bath. This was prepared by Mr. J. T. Irvine, and was illustrated by a great number of drawings. The present abbey church stands only on the site of the nave of the larger building, the foundations of which were partially uncovered during the recent repairs.

CHIPS.

A brass lectern has just been received at the Cathedral Church, Calcutta, from the ateliers of Messrs. Hart, Son, Peard and Co. It was designed by Mr. Arthur W. Bloomfield, M.A., architect, and has a large ∧-shaped double book-rest, similar to some of the best ancient examples, the ends of which are formed by a series of plates with tracery piercings, and beneath a capital whose reticulated foliage extends to the full size of the soffit; on four sides of the massive octagon base are emblems of the Evangelists.

The old churchyard cross of Clyst Honiton, whose granite shaft for generations laid uncared for and forgotten in the farmyard at Treasbeare, has just been restored, and is now refixed in the graveyard. Like the ancient stem, the whole of the new portions are in fine grey Devonshire granite, and these consist of a triple approach of steps, octagonal on plan, over which rests a massive base. Upon this the old shaft has been placed *in situ*, and above is a bold and well-worked cross. The restoration has been carried out by Mr. Harry Hems, of Paris-street, Exeter.

Mr. Alfred B. Brady was unanimously appointed on the 6th inst. to the surveyorship of the Docking Union Sanitary Authority, Norfolk. The district comprises 126 square miles, and includes the fashionable watering-place of Hunstanton. Mr. Brady was chief assistant to Mr. G. W. Stevenson, M.I.C.E., of Westminster, and was previously in the engineering department of the Lancashire and Yorkshire railway at Manchester.

Sir W. A. Rose and Co., of Upper Thames-street, have been awarded a first-class medal at the Melbourne Exhibition for the excellence and purity of their manufactures.

A Hundred Thousand Replies and Letters on subjects of Universal Interest have appeared during the last ten years in the ENGLISH MECHANIC AND WORLD OF SCIENCE, most of them from the pens of the leading Scientific and Technical Authorities of the day. Thousands of original articles and scientific papers, and countless receipts and wrinkles embracing almost every subject on which it is possible to desire information have also appeared during the same period The earliest and most accurate information respecting all new scientific discoveries and mechanical inventions is to be found in its pages, and its large circulation renders it the best medium for all advertisers who wish their announcements to be brought under the notice of manufacturers, mechanics, scientific workers, and amateurs. Price Twopence, of all booksellers and newsvendors. Post free 2½d. Office: 31, Tavistock street, Covent-garden W.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

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N.B.—Cases and vols. must be ordered through a bookseller or newsagent, as the regulations of the Post-office prevent them from being sent by post.

Received.—T. W.—J. S.—H. Bros.—R. A. A.—J. T. W.—K. L. B.—T. B. I. Co.—C. D. and Co.—B. V. B. Co.—J. C.—H. W.—H. H. G.—N. E. Ry. Co.—E. C. I. A.

T. T. (The article you refer to is taken bodily from our own columns. See p. 351. It is a common practice of the very insignificant journal which thus fills its pages, and which we do not intend to advertise by rebuking.)—S. L. (See our notice of the Exhibition this and last week. They have no office in London that we know of.)

Correspondence.

THE PRESIDENCY OF THE INSTITUTE.

To the Editor of the Building News.

Sir,—I think it will be generally conceded that the greatest enemy of the Institute could desire nothing better than the proceedings which have been taken by some malcontents with reference to the election of the next President.

Let us, Sir, divest the matter altogether of personal comparisons between Mr. Street and Mr. Horace Jones, as these have nothing whatever to do with the present question, and let us rather endeavour to see how this much-to-be-regretted contest has arisen, and who is responsible for it, so that the blame—and there must be blame—may fall upon the right shoulders.

So far as I recollect, before Mr. Whichcord was nominated as President, Mr. Street, who stood next in order to become senior Vice-President, resigned that position, for reasons then stated, but to which it is not now necessary to refer. Mr. Whichcord has (and in this I know the members generally will agree) most successfully, and to the pleasurable surprise of many who did not know him, conducted the affairs of the Institute with a courteous tact and ability which have left nothing to be desired.

Mr. Street having voluntarily abdicated the position in which the Institute had placed him, the next in order of precedence to occupy the chair was Professor Lewis, who has intimated his inability to take his turn; and, in consequence, the next in order is Mr. Horace Jones, who has been duly nominated by the Council.

On this nomination becoming known, there was an indefinable sort of whispering that perhaps Mr. Horace Jones would not care to serve, and that then perhaps Mr. Street would. Then come upon the scene those enthusiastic and zealous partisans, Messrs. Robert W. Edis, F.S.A., and Mr. R. Phené Spiers, with their circular which you published last week, and which is calculated, I should say, to do nothing so much as to sow the seeds of discord between Mr. Street and Mr. Jones, and to force on a contest more prejudicial to the interests of the Institute than its most fervent opponent would desire.

It would occupy too much space to point out all the fallacious reasonings in the letter of Mr. Edis which appeared in the last issue of the Building News; but I would ask him kindly to consider that, until the what he terms "absurd by-law" is repealed, it remains in force, and every member of the body is bound in honour to submit to it.

Presuming that what I have above stated is a pretty accurate summing-up of the matter as it now stands, I would ask, Which of the two gentlemen is the better entitled to the support of the Fellows of the Institute—the one who, from whatever cause, voluntarily abdicated the position which would, if retained, have now placed him in the Presidential chair by the unanimous vote of the Institute, but who now, by the action of his partisans, is seeking to be "thrust upon the Institute," or the other who, at every stage legitimately chosen by his professional brethren, cannot now have any alternative but to leave the decision in the hands of those who have placed him in the position of being the nominee of the Institute at large for Presidential chair?

Unless, therefore, the actual contest is avoided by the withdrawal of the nominee of Messrs. Edis and Spiers and their unnamed and self-appointed committee, I hope that the Fellows of the Institute will, by a very decisive vote on May 9th, show what *they* think of the matter.—I am, &c.,

Wm. Woodward.

Sir,—Mr. T. Roger Smith appears to base Mr. Horace Jones's chief claim to the Presidency of the Institute in preference to Mr. George Edmund Street on the score of the architectural examination, which he states Mr. Jones has done much to carry through, and Mr. Street is opposed to.

Without admitting this view of the case, allow me to point out that if we may judge by the number of candidates now presenting themselves for the associateship, there will be very few left to come up for examination for the next two or three years.

Mr. Street, however, is not likely to attempt to disturb that which has been passed and accepted by the bulk of the Institute. He would, however, I am sure, do his best to raise the standard of the examination from the low level to which it has been allowed to descend. As now passed, it seems to be specially framed to keep out all artistic power of design, whilst it offers a fair field, and plenty of favour, to surveyors, auctioneers, and builders' clerks.—I am, &c.,

R. Phene Spiers.

Carlton Chambers, 12, Regent-street.

R.I.B.A. CONFERENCE.

Sir,—Will you allow me to state, through the medium of your paper, that the sub-committee having charge of the arrangements for the meetings devoted to the subject of Quantities at the approaching Conference, will be glad to receive definite propositions and suggestions for discussion, and also the names of any gentleman proposing to speak thereat, in order that the proceedings may be duly arranged? Amongst other subjects, the expediency and desirability of quantities forming part of the contract, where they have been prepared by the architect of the building, will receive consideration.—I am, &c.,

J. Douglass Mathews, F.R.I.B.A.

April 12.

BARINGS' BANK.

Sir,—Permit me to record a protest against the wild criticism of the front of this building, signed "Wm. Woodward."

The writer—one hesitates to write critic—has evidently no sympathy with the work of Messrs. Norman Shaw and J. J. Stevenson, and he warns students "not to be led away from the true principles of architecture and art by any passing and spasmodic deceit, by whomsoever practised;" and with the disingenuousness of inexperience he adds: "All this new style of architecture is simply *prigged* from a bygone style and *doctored up* with the necessary quantity of *unadulterated ugliness* to make it appear original." Further, the building in question presents to him only "distorted features," "badly proportioned holes," "insipidity," and an "incongruous cornice;" and he refers to it as a sample of "stuff *foisted* on the public" by "inconsistent visionaries" who are "gradually but surely bringing the profession into ridicule."

Now, Sir, one does not expect figs from thistles, enthusiastic admiration of a Gothic structure from a pure Classicist, a keen appreciation of the merits and beauties of St. Paul's Cathedral from a Goth; nor are we disappointed when we find a surveyor, pure and simple, with no reverence for Queen Anne. Still, criticism to be just should be decent, and done with knowledge. It seems to me the reverse of this when it takes the form of the letter from which I have culled the above choice phrases.

April 12, 1881. J. S.

Sir,—Amidst vagaries, will-o'-the-wisps, styles, and other would-be saviours of the building fraternity, or Architectural Society, as we prefer calling that branch of mankind that erects dwellings and temples for its fellows, now and then your paper contains some marvellously bright beams of light from the everlasting fire of truth. Surely the letter from Mr. William Woodward, published in your issue of April 8th, is such a one.

All our dim, hazy feelings and strivings after a little bit of the mystery and craft of building are laid hold of by Mr. Woodward in a most positive manner and flung away to the winds, and the purely practical portions of our beings are made to stare at each other in their utter amazement and gladness, at the concise and clear lesson for their guidance they have put in their very hands, and are able so thoroughly well to lay hold of. Yes, truly, away with yon wretched offshoots of putrid imaginations, make way for a good straight-in-the-face lesson; your froth and scum from overcharged panels of impracticalness give way to a good sound doctrine as easily seen as it is laid hold of. How willingly we students now free ourselves from all such excrements and gossamer, being bound in so long by such puerilities; with what open arms and joyful mien do we hail the grand Catholic truth of "True principles of architecture"! Our long-carried load is gone, and we rest contentedly on this our guide.

Principles, just one minute, let's see, look in and out, up and down, not to miss one bit; the saviour of our society, what bigness and pruriency does it seem to show; we long to embrace our new guide. But no—there's something cold, dead, chilling in it; no glistening of eyes, no warmth greets us and imparts its influence and companionship. This soon increases, and our new king, fallen from the gods, is as all the rest, untrue, and full of selfliness and deceit, whatever its name be, and is utterly devoid of all that our yearnings and longings have been for ever seeking. Again, we fall disheartened and disappointed, determined never again to ask for a king.

But can we never dress anything up in the form of a leader, then give it life and power of leading? Can we never get life breathed into a statue, or must we be for ever without that infallible guide the human builder's heart is for ever seeking?

Just let us gaze into the old ages. How is it our forefathers have not left us some perennial seer and teller? Why did the majestic self-contained intellectualism of the Greeks, the surging, never still, feverish-earnestness of the Mediævalists leave our earth and bury their secrets with them? Why didn't the sphinx builders, the old Buddhists, the artificers of the Old Testament Temple, and indeed all the old building fraternities from the beginning until the last hundred years or so, leave their talismanic cunning to us? Surely, if they had only thought their more civilised nineteenth-century children would be moaning, under unanswered prayers from a cold statue of true principles, each of these generations would have left their great secret in some tangible form.

It is Mr. Woodward who gives us this image of true principles for us to worship, and who promulgates a terrible sentence on all and everything that is not inspired by it to good works. If it were not that "our dead selves" by it are not led to "higher things," the whole building fraternity would shout forth their gratitude to Mr. Woodward. But our knees are still unbended before it, all is cold and still within us, and we are forced to find refuge and help in some other way.

Mr. R. Norman Shaw, R.A., is wrong; is even placed on a level with the small nothingnesses of some of the would-be joke-makers of *Punch*, even inveighed against as foisting some kind of stuff on the public, is cruelly accused of borrowing features from a by-gone style (terrible word), mixing them up with his own imagination, thus distorting them, and bringing forth a horrid abortion, with the name of "unmitigated ugliness." And then, Mr. Shaw has done all this in the face of the true principles: reason, symmetry, unity, proportion, and beauty, apart from convenience and solidity, or, as one of our late lamented masters would say, has "swallowed his formulas," and effectually, too. And, again, Mr. Shaw has pandered to ignorant patrons, and led that part of "unaccommodated" humanity, Mr. Woodward calls the Peacock and Lily fools, into believing his work is beautiful; and then, not quite to finish with this last somewhat peculiar achievement, something further awaits Shaw, in his being placed with such an artist as Mr. J. J. Stevenson, and others not named, and labelled "inconsistent visionaries." Mr. Woodward completes his letter by referring to what did not produce several large names, which represent past great men, to whom reverence is due from, and given to, by all, although we doubt if the cold image had much to do with with their production. Then, in a little last sentence, we are told that Raphael's our friend, and not Whistler.

Great Pope must have been in a rather hallucinary state, probably, when he wrote, "For forms of faith let graceless zealots fight, his can't be wrong whose life is in the right. In faith and hope the world will disagree, but all mankind's concern is charity." Shakespere, and from him backwards and forwards all along the line, mighty names, too numerous to mention, even to him we lately lost, seem to point in exactly the contrary direction to Mr. Woodward's True Principles statue; the greatest who are still with us: John Ruskin, George Edmund Street, R.A., Richard Norman Shaw, R.A., Alfred Tennyson, than whom none living are greater, I suppose, and whose names are household words (not to mention numerous others in whom surely are E. W. Godwin, and that sparkling genius, Whistler), appear to teach us very differently. Their work always seems to say: An incomprenensible soul forms part of ourselves, and that that soul must clothe its meaning, when it longs to express itself, in as true, chaste, refined, and earnest way as it may be able to. Truly, Mr. Woodward, grand though your ideal is, it is only a code, a law; it touches us not, and it is not breathing with life. May we not then have a little burst of human nature, expressed in whatever way it will, although accompanied with a host of bad humours on the part of its plagiarists? And please do not only bind us in with huge columns and restored old buildings.

Be assured that that enlivening, cheerful, honest (mark the word!) bank in Bishopsgate-street, won't bring about a total cessation of good building and true principles, although the profession be brought into ridicule with her employer and darling the Public. Human nature forms the essence of the ingredients of both these corporate assemblies, and may we not leave her to further her own cause in both? She always hides herself from "styles and principles"; but leaps out again when one of her votaries frees himself and goes straight to her for insight for doing good work; certainly the men I have just named are such. I will just conclude with what all of us feel as true as when Shakespeare wrote it, "Those things please best which least know how, while great things labouring perish in their birth."—I am, &c.,

Spruce Affectation.

NOTES ON THE CORROSION OF IRON.

Sir,—When iron is placed in contact with other metals, galvanic action is instantly excited; the positive metal, or that which has the greatest chemical activity, will suffer, and thus preserve the negative or less active metal.

The theory of metallic preservation is, that the galvanic action of the electro-positive metal decomposes the water, which, in the ordinary action of oxidation, threatens the electro-negative metal, the hydrogen which is liberated combining with the other gases to form new compounds. Thus zinc is electro-positive in relation to iron, and when placed in contact with that metal, even in water, will exercise a preservative influence. Lead, on the other hand, is electro-negative towards the iron, and the latter metal, being positive, will thus preserve the lead at its own expense.

An examination of any old iron railings which have been fastened to the stonework by means of lead will clearly show the detrimental action that is caused by lead when in contact with iron: the lead will be found to be in a perfect state of preservation, while the iron in its proximity will show evidences of active corrosion. Tin is also electro-negative towards iron, and thus, instead of preserving the iron, it generally accelerates corrosive activity.

Copper, brass, and especially gun-metal, are also electro-negative in relation to iron. The iron, therefore, suffers by contact with these metals and alloys.

The author has deduced the following average coefficients of corrosion of iron and steel (under various conditions and for twelve months) from a vast number of experiments carried out by Mr. Mallet, F.R.S., Professor Calvert, and other equally reliable and distinguished authorities:—

Table showing Coefficient of Corrosion of Iron and Steel on One Square Inch of Surface in Twelve Months.

	Foul Sea-water.	Clear Sea-water.	Foul River-water.	Pure Atmospheric Air. Clear River-water.	Atmospheric Air of City or Manufacturing Districts, or Sea Air.
	Grains.	Grains.	Grains.	Grains	Grains.
Cast Iron ..	3·500	3·386	2·034	0 604	2·537
Wrought Iron	10·450	5·855	7 680	0·655	6·690
Steel	10·370	5·175	6·045	0·675	6 675

	Grains.
Cast iron, in contact with brass, exposed to sea-water of average foulness	10·175
Cast iron, in contact with copper, exposed to sea-water of average foulness.....	10·685
Cast iron, in contact with gunmetal, exposed to sea-water of average foulness	18·630
Best wrought iron, in contact with brass, exposed to sea-water of average foulness	14·820
Best wrought iron, in contact with copper, exposed to sea-water of average foulness	21·395
Best wrought iron, in contact with gunmetal, exposed to sea-water of average foulness.....	24·195

The foregoing results are evidences of the danger of permitting the contact of metals of opposite electrical polarity.

Cast iron, protected with one coat of lead paint, exposed to the atmosphere of a city, loses by corrosion 0·6355 grain per square inch.

It will be surprising to many that corrosive action should proceed under a coating of paint; but this action occurs, owing to the drying oils, when the paint is applied, absorbing the oxygen from the air, and becoming converted into a transparent resinous varnish. Occasionally the absorption of the oxygen produces considerable heat, which phenomenon is essentially similar to ordinary combustion, carbonic acid and hydrogen both being evolved. This absorption of the oxygen by the oil, through the minerals forming the colour-medium, is the cause of the microscopic pores which exist in all parts of the coating of paint, the number being proportionate to the affinity which the oil has for the oxygen. These minute pores are the cause of the slow oxidation of the metal under a coating of paint, the oxygen and moisture passing through the pores to the metal. Iron exposed to any influences likely to promote corrosive action should therefore be coated with at least three layers of paint, each coat of paint being allowed to dry before the application of subsequent ones.

As to the minerals, zinc is far preferable to lead, owing to its positive electrical relation to iron.

The author has arranged the following formulæ in order to ascertain with a tolerable degree of exactitude the metallic life of iron and steel of any given section and under the various conditions enumerated in the foregoing tables.

Let C represent the coefficient of corrosion for the various characters of iron exposed to various conditions which can be obtained from the foregoing tables.

β the weight of the cubical section of the metal expressed in grains.

γ the lineal length of perimeter in section.

Then $\frac{\beta}{C \times \gamma} = S$ = years of metallic existence of the metal.—I am, &c.,

B. H. Thwaite, F.C.S.

STRATFORD-UPON-AVON CEMETERY COMPETITION.

Sir,—As one of the unsuccessful in this competition I shall feel obliged if you will allow me to say briefly that I fully endorse what your correspondents "£1,300," "A Competitor," and "Another Competitor" have expressed in their letters published in your issues of March 11th, 18th, and 25th. There can, I think, be no doubt in the mind of anyone who saw the whole of the designs submitted, who was capable of forming a correct opinion on the subject, that the second and third designs were so placed solely as a compliment to the fellow-townsmen of the committee, who have, by so placing them, involved themselves in a difficulty, the only equitable way to escape from which is to request the competing architects to return their designs for the purpose of enabling the committee to make a more judicious selection. I see no cause for supposing that such a request would meet with anything but approval from all concerned.—I am, &c.,

April 7. An Old Subscriber.

DISCONNECTING TRAPS AND THEIR VENTILATION.

Sir,—I said at page 375, in your issue of 1st inst., that the use of D-traps below closets being forbidden by the amended By-laws of the Local Government Board was undoubtedly right.

As it may be thought that my objection to traps being so used is limited "to the kind known as D-traps," I will thank you to allow me to add that such is not the case, for I consider it a decided mistake to put any trap below a closet when the soil-pipe and drain are properly trapped and ventilated, whether it be called a D, a V, a P, an S, or by any other name, for all of them are mere modifications of the common siphon trap, and in my opinion all are almost equally objectionable.

In houses where there is but one soil-pipe—and that properly trapped and ventilated of course—I prefer to lead the wastes from bath and lavatory basin direct into the soil-pipe, to delivering them into an outside disconnecting trap below the grid above it. These traps are very, very often neglected, and then they become very impure. In either case a very small and slight trap, as near the bath, &c., as possible, may be put, as it may be formed by a slight bend in the pipe when led into the soil-pipe, to prevent air entering the latter at any other than at the appointed inlet near the foot of it.—I am, &c., Gregson Banner.

11, Billiter-square, April 11.

STAINED GLASS.

Condover.—A memorial window, the work of Mr. John Davies, Wyle Cop, Shrewsbury, has this week been placed in Condover Church. It is a three-light window with tracery. In the centre opening is "Our Saviour at the tomb of Lazarus"; in the right-hand opening, "The raising of Jairus's daughter"; and in the left-hand opening "The raising of the son of the widow of Nain." The subjects are surrounded with a case and canopy of rich floral design, with "Alpha" and "Omega" in the bases of the outside lights, and "I.H.S." in the centre base. In four pieces of the tracery are the four Evangelists, Matthew, Mark, Luke, and John; and four other pieces of tracery are filled with the same style of ornament as the base and canopy.

Bishop's Itchington.—During the past week, the parish church has been enriched by a stained glass window, wrought at the works of Messrs. Holland and Holt, of St. John's, Warwick. The window consists of two lights. In the tracery above there is a representation of the Holy Trinity. In the right light is a figure representing the Good Shepherd; in the left arm rests a lamb, and in the right hand a shepherd's crook. In the left light is a figure representing the Sower. At the foot there is the inscription, "In memoriam, Blain Mandale, M.A., vicar of this parish, 1869-1878."

Intercommunication.

QUESTIONS.

[6473.]—**R.I.B.A. Examinations.**—Would any of your readers who have passed the R.I.B.A. proficiency examination kindly give me, as early as possible, a few ideas respecting rules, subjects, and the average age of candidates? Also any useful information regarding same? Perhaps it would be as well to say I have syllabus of the examination, but which, I think, is not nearly explanatory enough.—C. E. M.

[6474.]—**Breweries.**—Can any of your readers recommend me a good work on the construction of breweries and malthouses on the most modern and improved principles? I require the information more particularly as to malthouses.—C. S.

[6475.]—**Advantages of Centrolineads.**—Will some of your readers kindly say what advantages are gained by using a centrolinead in the preparation of perspectives, also of a pair of centrolineads over one? Where can directions for using them be obtained, from makers or books?—O.

[6476.]—**Book on Painter and Decorators' Work.**—Do any of your readers know of a good practical book on painter and decorators' work, with price of book, describing how to mix and use paint, water and oil gilding, &c.?—O.

REPLIES.

[6407.]—**Cubing a Building.**—The depth of footings should also be included in the height of a building as well as half the height of roof. "G. H. G." does not appear by his answer to allow anything for footings, though this should be done for his own reason. It also appears to me that it would always be desirable to price out the trenching and concrete for foundations separately from the cubing. It is, I believe, never done; the concrete is generally neglected in calculations, but as this varies so much in quantity, owing to difference of soil, it must affect the cubing considerably. Should the trenching and concrete be taken by itself and added to the amount obtained by cubing, a slight reduction should be allowed per foot cube in the pricing.—Hugh McLachlan.

[6423.]—**Chapel.**—A chapel to be used by all denominations might be placed any way, since those who are observant of the easterly direction would refuse to use a chapel in common with Dissenters.—Hugh McLachlan.

[6438.]—**Architects' Drawings.**—In reply to "Doubtful," I may say there have been one or two unfortunate decisions against architects as to the legal ownership of the drawings, and although I do not think "Doubtful" is legally bound to deliver them up before his account is paid, I should advise him to do so, to save trouble, unless he intends to try the case at law, the result of which would be doubtful. Unfortunately, in the eyes of the law, the drawings are considered as being a part of the services rendered, and the architect not much better than a tradesman who supplies them.—G. H. G.

[6450.]—**R.I.B.A. Exam.**—The Council, in their rules and conditions, give a selection of textbooks. Others might be used which have been published of late years, as Tarn's "Science of Building"; Jenkin's and Raymond's "Legal Handbook for Architects," and recent works on sanitary matters.—Hugh McLachlan.

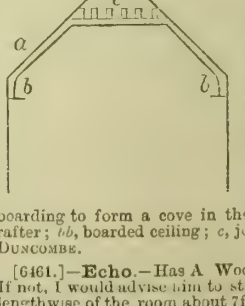
[6451.]—**Local Board Surveyors.**—Not less than £150 per annum should be paid to secure a man with any real approach to the required amount of knowledge. Private practice is not allowed, though often winked at.—Hugh McLachlan.

[6457.]—**Constants.**—Using, as is generally done, ten hours as a day's work, it will be found that the constants given by Messrs. Fletcher and Dodson are near enough for practical purposes. I should think 1d. an hour is an extreme price to add extra to a carpenter's wage for master's price, though it should never be less than 1d. A builder is generally allowed 15 per cent. profit in fair paying work—Hugh McLachlan.

[6458.]—**Extras.**—Your case appears a hard one. As far as I understand law, if you have put your signature to such a clause you must be bound by the architect's rule; but I cannot conceive that he can prevent your rectifying defects if you prove that you intend to amend them as he requires.—Hugh McLachlan.

[6459.]—**English Cathedrals.**—Murray's "Handbook of the English Cathedrals" is the best general descriptive book of moderate price I know of.—G. H. G.

[6461.]—**Echo.**—The great obstacle to successful hearing is the lantern in the centre of the roof. It might remedy the defect mentioned by inclosing the lower portion of the "lantern-well" with glass, if the room is depending on light from this source, otherwise it would be best to dispense with it altogether, as glass is directly opposed to sound. If the roof is open, try a boarded ceiling, say, half-way up the rafters, and continue boarding to form a cove in the angles of the walls. *a*, rafter; *bb*, boarded ceiling; *c*, joists on straining beam.—Duncombe.



[6461.]—**Echo.**—Has A. Wood tried the wire remedy? If not, I would advise him to strain a few wires across or lengthwise of the room about 7ft. high. Particulars of a very good plan appeared some time ago in the Building News, invented by Mr. Engelt, of the City-road.—G. H. G.

[6464.]—**Baker's Oven.**—The suggestion to build oven with concrete in lead of bricks is a good one, and may be thoroughly depended on if performed properly. The concrete had better be made with some calcined material, as an aggregate. The proportion of 1 of Portland cement to 7 or 8 of gravel, including sand, may be used. Slag from furnaces is a good substitute for the gravel, also broken brick, burnt clay, breeze, or coke, any of which may be used if clean. I should prefer burnt brick or porous slag.—G. H. G.

[6465.]—**By-Law of the Enfield Local Board, &c.**—A room in the roof is generally understood throughout the building trade to be a room constructed entirely within the roof itself. As the tie-beam forms the framework of the floor, the sketch of the "room," as given in last week's issue cannot be classed as such.—W. G., Builder.

[6466.]—**Australia.**—In reply to "Colonist," I can say from experience that an architect and surveyor's assistant has only poor prospects in Australia. I tried both Melbourne and Adelaide. At the latter place I got into the Government survey, and was sent into the "Bush." The work is rough, requiring a good constitution, and, without influence, an appointment is not easily obtained. If you have a situation at present I would certainly advise you not to try Australia.—Kyle.

[6470.]—**Floors.**—"Listed floor-boards" are those which have the sappy edges removed before being laid. This, of course, reduces their width, and consequently is not often done. Besides, the flooring now prepared is from such good battens, that sappy edges are a thing of the past.—H. L.

[6470.]—**Floors.**—The meaning of the word "listed" is to take off the sap from edges, and it is mostly specified that floors shall be laid with a given width and thickness listed clear of sap. I am not at all aware how that term has been derived, unless it has the same meaning as taking the list off the edges of cloth.—William Huddleston.

[6470.]—**Floors.**—"Listed" means having the sapwood removed from the edges of the floor-boards.—Surveyor.

[6471.]—**Material for Mounting Tracings on Linen.**—Glenfield starch. No other starch will do.—Surveyor.

[6471.]—**Material for Mounting Tracings on Linen.**—I have always preferred paste to any other adhesive substance. It should be made of the consistence of cream, and be free from all lumps. Spread it evenly over the surface.—G. H. G.

[6472.]—**Plain Tile Roofing.**—(1.) The lowest pitch which I have found safe in exposed places for tiled roofs is the square pitch. It must be remembered each tile, from its thickness, lies at a flatter pitch than the general pitch of roof or rafter, as it is tilted up by the one below it. One third of the tile exposed is found to give a good lap. Pantiles may be laid to a lower pitch, as they overlap less. (2.) I have not much faith in bedding in mortar, and I think, so bedded, roofs are less dry. Hay is better as a bedding material, as it keeps the tiles from shaking and flying, but it soon decays. Tiling is certainly better hung than nailed.—G. H. G.

LEGAL INTELLIGENCE.

The Law as to Advances to Sub-Contractors.—At the Brighton County-court last week the case of Wilton v. Willett was heard, in which plaintiff, a plasterer, sought to recover damages from the defendant, a builder, for breach of contract. Plaintiff stated that he agreed to do the plastering required in six houses at Kemp Town, in consideration of plaintiff paying him £55 per house. An arrangement was made between them that sufficient money should be advanced to pay plaintiff's men, but after a time defendant refused to advance the whole of the money required. Plaintiff, not being a moneyed man, was, therefore, unable to go on with the work, which was finished by defendant. A written agreement was put in, by which plaintiff contracted to do the plastering in each house for £55, but the document did not provide for the advance of any money. His honour said, although it might be customary to advance money to men taking work of the kind, the plaintiff had no legal claim under the agreement, and he must, therefore, be non-suited.

Small or Large Sewers.—Appeal.—Helby v. The Wandsworth District Board of Works.—A case of interest to those engaged in the development of building estates has just been the subject of an appeal to the Metropolitan Board of Works. A new road is being formed on the south side of Battersea Park by the appellant, the lessee from H.M. Commissioners of Public Works and Buildings. The length of the road is about 800ft., and it is proposed to erect on each side thereof about 30 eight or ten-roomed houses. Three applications had been made to the Wandsworth district board of works to approve respectively a 12in., 15in., and 18in. stoneware pipe sewer, but all had been refused, the local board requiring a 3ft. 6in. by 2ft. brick egg-shaped sewer encased in 6in. of Portland cement concrete. The appeal against this requirement was conducted by Mr. Ernest Turner, architect, who submitted that a sewer of this size was very largely in excess of what was necessary, and involved a great outlay; moreover, that large sewers for drainage of small areas were most objectionable on sanitary grounds, and altogether at variance from the teaching of modern sanitary science, and the general principles and more recent practice of the Metropolitan Board of Works. Mr. Corsellis, solicitor, appeared on behalf of the Wandsworth board. The appeal was allowed, the Metropolitan Board of Works committee intimating that the use of 18in. pipes would be approved.

Our Office Table.

The Board of United States Engineers have decided upon the location for the proposed exterior breakwater of Chicago. The construction of the new, exterior, or detached breakwater will be commenced this spring. It will be about 5,400ft. in length and 30ft. wide, having a direction of about E.S.E. Its westerly end will be at a point 4,850ft. due north of the east (or outer) end of the present "North Pier," and its easterly extremity at a point 2,200ft. north, by 4,700ft. east from the above mentioned point on the north point, or 4,200ft. south by 1,100ft. west of the water works crib. This work will be done by hired labour, and materials furnished by contracts, with Major G. J. Lydecker, Corps of Engineers, U. S. A., as the U. S. Engineer in charge. It will be formed of cribs 100ft. in length and sunk directly upon the bottom, no piling being considered necessary, as examinations give a clay bottom covered with a shallow stratum of sand and stones.

An Art Exhibition will be held at St. Jude's schoolroom, Commercial-street, Whitechapel, from April the 14th to the 22nd inclusive. It will consist of paintings by Sir Frederick Leighton, P.R.A., G. F. Watts, R.A., H. S. Marks, R.A., and others; a collection of ancient and modern needlework and embroidery; pottery and porcelain; a representative series of the various English manufactures, and also a collection of Oriental and European; and scientific instruments from the Science and Art Department of the South Kensington Museum. Open every day from 10 a.m. to 10 p.m; admission, threepence.

Major Marindin has made his report to the Board of Trade on his inquiry into the circumstances which led to the recent failure of the viaduct across the Solway. This viaduct—belonging to the Solway Junction Railway—was opened for traffic in 1870, its length being 1940 yards, with 181 single and 12 double piers, 192 spans of 30ft. and 12 spans of 50ft. over the double piers. Major Marindin says the disaster furnishes a very convincing proof of the unreliability of small cast-iron columns when used for the piers of viaducts in positions where they are likely to be subjected to any blow or sudden shock; and, as it was proved by the fate of the Tay Bridge that they are equally unreliable in cases where they are exposed to heavy transverse strains from wind-pressure, it must be evident that, whether for high viaducts exposed to wind, or for viaducts across estuaries in this climate, where they are subjected to sudden changes of temperature and to blows from floating ice, it would be far better in future to avoid any such mode of construction. He does not, however, consider that the reconstruction of this viaduct need be objected to, provided due care is taken, either by the erection of timber ice fenders, or by the substitution of wrought-iron rakers of sufficient strength to withstand the shock of the blows of the floating ice, to guard the cast-iron bearing columns from any such danger; but, upon the permanent way, strong wooden guards outside the rails, as a protection in case of a run-off, should be provided, in accordance with the requirements of the present time, and it is worthy of consideration whether it would not be better to increase the width of the spans at the centre of the channel, so as to permit the ice to pass more freely than it does at present.

An inquiry was held at Leyton, Essex, on Friday before Mr. Arnold Taylor, one of the inspectors of the Local Government Board, into an application by the Leyton local board to borrow £5,000 for building offices for the transaction of the board's business. Mr. Knight, the author of the accepted design, explained the plans, and stated that his estimate of the cost was £4,404 4s. 9d. for buildings, and £500 for fittings. The only opposition offered was by Mr. Arber, the architect to whom the third premium was awarded in the competition, who complained of the insufficient lighting of Mr. Knight's building in the corridors and committee, and also to the position of the tower, which would, he said, necessitate placing the hall down a side-street. Reference was made to a new map of the district, just completed by Messrs. Bailey Denton, to controvert the latter assumption, but Mr. Arber said the map was not correct, and further asked the inspector what would be the upshot if the work could not be carried out for the money sought to be borrowed, as he contended it could not be? The inspector suggested that it would be better not to speak of it, or Mr. Knight would, after the manner of architects, at once proceed to add more. It appeared, however, that the sum applied for would not cover the architect's commission, and the members of the board amended the application to £5,500.

A report has been issued on the system of circulation of art-objects on loan for exhibition, as carried on by the Science and Art Department, South Kensington, from its establishment to the present time. During last year 5,217 objects and 5,872 pictures in frames were sent out from the parent museum to local exhibitions. Private owners have been encouraged to follow the example of the South Kensington Museum. It is believed that not fewer than 170,000 loans of examples of fine and industrial art have thus been made by private owners to the various art exhibitions with which the Department has been connected since 1854. Detailed information as to the loans of the Department is given in a number of appendices to the report.

On Wednesday a lecture entitled "Suggestions for the Management of Cases of Small-pox and of other Infectious Diseases in the Metropolis and Large Towns," was delivered by Dr. Richardson, before the Sanitary Institution of Great Britain. In the course of his lecture, Dr. Richardson urged that the required accommodation being known, the local authorities should keep ready, at all times, within the parish, such necessary accommodation, in small hospitals situated in different parts of the parish or locality. He described the size, construction, and position of such hospitals, urging that each hospital should not be larger than is sufficient to receive twenty-four persons at one time; that each should be constructed on the separate system for the patients; that each should be constructed of iron, so that it may at any time be absolutely purified by fire throughout all its structure; that each should be placed on the upper story of a building, forming, in fact, the top story of one or more houses, so that it may be lighted and ventilated directly from its roof; that all the air that passes out of the hospital, when it is occupied by infectious persons, should pass through fire, and that each patient should be carried into the hospital by a valved lift, which lift should pass through a shaft, so as to draw up air during its ascent, and which should, when required, be effective for flushing the hospital with air.

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CHIPS

A new church for Queen-street United Presbyterian Congregation, Edinburgh, was opened last week. The style is that of the thirteenth century. The church measures 72ft. long by 46ft. wide inside, and is provided with a gallery at the south end. The ground-floor is seated for about 550 persons; the gallery for about 150 persons.

In our notice of the Society of British Artists' Exhibition last week, the name of Mr. Richard M. Roe was inadvertently spelt Rae.

The Metropolitan Board of Works, at their meeting on Friday, approved plans prepared in the superintending architects' department for the erection of a fire-brigade station in Theobald's-road, and ordered tenders to be procured. It was reported that the movable fire-station scheme was about to be extended by the erection of fire-stations at Hyde Park-corner, Tottenham Court-road, City-road, Aldgate High-street, and Elephant and Castle, Newington Butts.

A polished brass eagle lectern has just been fixed in Skipton parish-church. It has been supplied by Messrs. Potts, of London, and is erected at the cost of John and William Mitchell, in memory of their father and mother.

Extensive alterations are in progress at the Derby Station of the Midland Railway Co. A new platform, 850ft. long and 46ft. wide, is being constructed, and the central platform is being lengthened by 350ft., and a bridge 16ft. wide, and also a subway, made to it, in place of the present level crossing. The works have been contracted for by Messrs. Handiside and Co., and Mr. E. Wood, of Derby.

NOTICE TO ARCHITECTS.
A GENERAL CONFERENCE of Architects of the United Kingdom will be held at the Royal Institute of British Architects during the first and second weeks of May. The President, who will deliver an opening address, will previously receive Members and their friends, and any ARCHITECTS (non-members) who desire to attend, on Friday, the 6th May, at 8 p.m. The second Conference Meeting will take place on Saturday morning, the 7th May, and the Institute Dinner, at which NON-MEMBERS may, on application, attend, will take place that evening at 7.30 p.m. The questions of "COMPETITIONS" and "QUANTITIES" will be submitted for discussion to the Conference. A conversazione will be held on Wednesday evening, the 11th May, at 9 p.m., and the Conference will close on Thursday evening, the 12th May, when papers on "Mural Decoration" will be read and discussed.
J. MACVICAR ANDERSON, Hon. Sec.
WILLIAM H. WHITE, Secretary.
Royal Institute of British Architects, 9, Conduit-street, Hanover square, London, W.

MEETINGS FOR THE ENSUING WEEK.

Wednesday. — British Archæological Association. "Seals of the Knights Templars." By H. Syer Cuming, F.S.A. Scot. 8 p.m.
Thursday.—Civil and Mechanical Engineers' Society. "Drainage of North Lincolnshire." By J. H. Maughan. 7 p.m.

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—[Advt.]

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(See trade advt. on p. XXV.) [Advt.]

TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender—it adds to the value of the information

Abergavenny.—For the construction of sewerage works, for the town commissioners.—
Palmer, Birmingham (accepted) ... £4,507 0 0
[Lowest of 16 tenders, of which the highest was at £10,000.]

Ashton-under-Lyne.—Estimates for erection of detached residence, with stable, coach-house, and outbuildings. Mr. G. Gill, Ashton-under-Lyne, architect. Quantities by the architect:—

Williamson, J. W., Ashton-u-L.	£1,563 10 0
Burton, J. and Sons, Ashton-u-L.	1,350 0 0
Haughton, A., Hyde	1,300 0 0
Garside, Barns & Co., Stalybridge	1,280 0 0
Grayson, J., Stalybridge	1,260 0 0
Holmes and Webster, Ashton-u-L.	1,250 0 0
Marsden, A., Ashton-under-Lyne	1,218 0 0
Gibson, J., Ashton-under-Lyne ...	1,215 0 0
Castle Hall Sawmills Co., Stalybridge	1,200 0 0
Cropper, I., Dukinfield	1,195 0 0
Taylor, G., Dukinfield	1,186 0 0
Storrs, W. Sons & Co. (Limited)*	1,185 0 0
Architect's estimate	1,200 0 0

*Accepted.

Bethnal Green.—For warehouse (No. 2), Bethnal-green, for R. Letchford, Esq. Messrs. Hammack and Lambert, architects:—

Hyatt	£1,883 0 0
Wire	1,777 0 0
Cubitt	1,645 0 0

Bethnal Green.—For warehouse (No. 3), Bethnal-green, for R. Letchford, Esq. Messrs. Hammack and Lambert, architects:—

Cubitt	£725 0 0

Bethnal Green.—For additions to warehouse, Bethnal-green, for Messrs. Allan and Hanbury. Messrs. Hammack and Lambert, architects:—

Cubitt	£911 0 0
Steele	870 5 0

Bewdley.—For the erection of schools for 130 children at Wribbenhall, near Bewdley:—
Price, E. T., Kidderminster ... £1,250 0 0
Accepted.

Canning Town.—Enlargement of Methodist Free Church Schools, Canning Town, E. Mr. F. Boreham, architect:—

	Fence & concrete	floor.
Goodman	£1,562 0 0	... £109 0 0
Sargeant	1,449 0 0	... 97 0 0
Sawyer	1,444 0 0	... 90 0 0
Bangs and Co. ...	1,400 0 0	... 91 0 0
Horlock	1,382 8 0	... 85 4 0
Morter (accepted) ...	1,300 0 0	... 88 0 0

Cardiff.—For public street works and town drainage, for the town council:—
Smith and Pring (accepted) ... £1,069 0 0

Colchester.—For alterations to Balherne-hill House, for the water committee of the town council. Mr. C. Clegg, borough surveyor:—
Rogers (accepted) £184 0 0
[Lowest tender received.]

Dartmouth.—For the erection of corrugated iron roof over vegetable market, for the town council:—
Vorpey (accepted) £98 10 0
[Lowest of four tenders.]

Deptford.—For the construction of sewers in (*a*) Junction-road and (*b*) Hood-street, St. Paul's, Deptford, for the Greenwich district board of works;—Mace (accepted for both) (*a*) £94 10 0 (*b*) £137 10 0

Exeter.—Erection of new house, for Mr. Passmore, Exeter. Mr. R. W. Best, Exeter, architect. Quantities not supplied:—
Phillips, Exeter £4,893 0 0
Luscombe and Son, Exeter ... 4,850 0 0
Sharland, Exeter 4,335 0 0
Stephens and Bastow, Bristol* ... 4,212 0 0
* Accepted.

Fulham, S.W.—For paving and other works in Wellsroad, for the Fulham district board of works. Mr. A. C. Bean, surveyor;—
Jones and Winipey (accepted) ... £369 0 0
[Lowest of five tenders received.]

Goole.—For enlarging the Alexandra-street Board Schools, Goole. Mr. William Watson, Wakefield, architect. Accepted tenders:—
Excavating, brick and stonework—
Elliott, R., Goole £401 16 0
Slating—
Rawlins, E. J., Leeds 75 0 0
Plastering—
Tattersall, T. C., Wakefield ... 38 10 10
Carpenter's and joiner's work—
Craven and Loyd, Wakefield ... 236 18 0
Plumbing, glazing, ironwork, and gas-fittings—
Johnson, F., Leeds 212 0 0
Painting—
Wales and Son, Leeds 21 10 0
[49 tenders were received.]

Goole.—For enlarging the Old Goole Board Schools at Goole. Mr. William Watson, Wakefield, architect. Accepted tenders:—
Excavating, brick and stonework—
Elliott, R., Goole £300 0 0
Slating work—
Stewart, G., Goole 74 10 0
Plastering work—
Tattersall, T. C., Wakefield ... 34 2 4
Carpenter's and joiner's work—
Craven and Loyd, Wakefield ... 223 19 0
Plumbing, glazing, ironwork, and gas-fittings—
Johnson, F., Leeds 57 0 0
Painting—
Wales and Son, Leeds 17 10 0
[52 tenders were received.]

Grantham.—For the construction of a screening tank, and the subsoil drainage of 90 acres of land at Marston, for the sewage committee of the town council of Grantham:—
Fawkes Bros., Birkdale, Southport £2,066 17 9
Accepted.

Grundisburgh.—For the rebuilding of a country road bridge at Grundisburgh, near Woodbridge, for the magistrates of Suffolk. Mr. H. M. Eyton, of Ipswich, county surveyor:—
Fosdick and Sons, Woodbridge ... £200 5 0
Accepted.
[Lowest tender received; surveyor's estimate, £209.]

Great Yarmouth.—For house, Regent-street, Great Yarmouth, for Mr. Samuel Bowen. Mr. J. W. Cockrill, Glencoe House, Gorleston, architect;—
Norfor £462 0 0
Want 454 0 0
Howes, T., York-rd., Gt. Yarmouth* 446 0 0
*Accepted.

Great Yarmouth.—For desks and furniture at the Northgate School, for the Yarmouth School Board:—
Hawes, G. E., Norwich (accepted) . £133 0 0

Great Yarmouth.—For erection of Grand Stand, Great Yarmouth, for the Great Yarmouth Race Committee. Mr. J. W. Cockrill, Glencoe House, Gorleston, architect:—
Contract No. 1, Concrete, walling, &c.:—
Drake £210 0 0
Bray 195 0 0
Beech and Cork 188 10 0
Norfor, Southtown, Gt. Yarmouth* 149 0 0
*Accepted.
Contract No. 2, Plasterer, slater, joiner, &c.:—
Bray 445 0 0
Salmon 440 0 0
Kemp 430 0 0
Springall 425 0 0
Fuller 410 0 0
Want 377 0 0
Norfor, Southtown, Gt. Yarmouth* 359 0 0
*Accepted.
Contract No. 3, Painter, &c.:—
Platt 80 10 0
Read 45 10 0
Green 43 0 0
Goffin, King-st., Great Yarmouth* 42 10 0
*Accepted.

Halifax.—For improvements at Range-lane, for the town council:—
Kendall, Joseph (accepted) £554 15 6

Lewes.—For building schools for St. Michael's parish Mr. Currey, architect:—
Pullinger, Lewes (accepted) £400 0 0

Leytonstone.—For the supply of a fire-engine for Leytonstone, for the Leyton local board of health:—
Shand and Mason £112 0 0
Merryweather (accepted) 102 10 0
Stone and Co. 95 0 0

London, E.C.—For the construction of sewers and gullies in Lime-street and Lime-street-square, for the Commissioners of Sewers for the City. Mr. W. Haywood, engineer:—
Taylor, J. and Co. £3,574 0 0
Dickinson, C. 3,425 0 0
Mays, R. 3,000 0 0
Anderson, A. and D. 2,999 0 0
Killingback 2,872 0 0
Mowlem and Co. 2,835 0 0
Crockett, W. (accepted) 2,642 0 0

London, W.C.—For new buildings at the rear of premises in New Oxford-street, for the Civil Service and General Store Company:—
Greenwood, J. T. £9,480 0 0
Grover, J. 9,373 0 0
Rider, T. and Son 9,222 0 0
Higgs and Hill 9,194 0 0
Laurance, E. 9,100 0 0
Langmead and Way 8,979 0 0
Macey and Sons 8,887 0 0
Colls and Sons 8,880 0 0
Bangs, J. W. and Co. 8,779 0 0
Chappell, J. T. 8,715 0 0
Brass, W. (accepted) 8,303 0 0

Margate.—For the new Globe Hotel, for Mr. F. Snelling. Mr. Edward Clark, architect:—
Contract No. 1: Foundations.
Rolfe, G. and R. £5,128 16 8
Sawyer, W. J., London 4,942 0 0
Macey, London 4,505 0 0
Manley, London 4,156 0 0
Paramor and Son, Margate ... 4,000 0 0
Denne, Upper Walmer 3,987 0 0
Adcock, W. J., Dover (accepted) 3,948 1 0

Mold.—For a new police-station at Mold, for the county magistrates of Flintshire. Mr. T. M. Lockwood, architect:—
Reece Brothers, Tarporley ... £3,900 0 0
Accepted.
[Lowest tender received, the highest being £16,000.]

Norwich.—For works of wood-paving in Magdalen-street, King-street, &c., for the town council:—
For supplying timber:—
Jewson and Co. (accepted) £8 19 0 per standard.
[Lowest of eight tenders sent in. Jewson's tender also accepted for cutting the blocks as per schedule.]
For laying wood blocks:—
Batch, J. P. (accepted) ... 10½d. per square yard.
[Lowest but one of nine tenders, the lowest, that of Lloyd and Co., of London, at 9d., having been withdrawn.]
For supplying blue lias lime:—
Nelson, C., and Co. (accepted) ... 24s. per ton.
[Lowest of nine tenders.]

The total cost of the present section of scheme will be about £10,000, and the cost per yard:—timber, 3s. 6d.; cutting, 3d.; laying, &c., 1s; and lime, &c., 4d.; total, 5s. 1d.

Romford.—For fencing in the Market-place, for the local board of health:—
Harvey, A., ... £33 10 0
Dowsing, J., ... 37 15 0
Hinds, J. (accepted) 29 6 0

Salisbury.—For building additions to residence at Fowler's-hill, Salisbury. Mr. Fred Bath, A.R.I.B.A., Crown Chambers, Salisbury, architect:—
Pellett, E., Salisbury £174 18 0
Adey, W. H., Salisbury 165 0 0
Dolman and Harris, Salisbury ... 162 12 0
Young, E. and Sons, Salisbury* ... 147 10 0
*Accepted.

Salisbury.—For new shop front and alterations to Nos. 60 and 64, Fisherton-street, Salisbury, for Mr. John Evans. Mr. Fred Bath, A.R.I.B.A., architect:—
Harris, G., Salisbury £288 0 0
Wort, J., Salisbury 250 10 0
Young, E. and Sons, Salisbury ... 249 0 0
Witt, E., Salisbury (accepted) ... 235 0 0

Salisbury.—For building additions and making alterations to Elysian Villa, Church Fields, Salisbury, for S. W. Brown, Esq. Mr. Fred Bath, A.R.I.B.A., architect. Quantities supplied:—
Oborne, J., Shaftesbury £1,062 10 0
Wort, J., Salisbury 715 0 0
Matthews, A. J., Salisbury ... 705 5 0
Young, E. and Sons, Salisbury ... 620 0 0
Witt, E. Salisbury 600 0 0
Harris, G., Salisbury (accepted) ... 597 10 0

Salisbury.—For building a villa residence on the Milford Manor estate, Salisbury, for Ambrose Tucker, Esq. Mr. Fred Bath, A.R.I.B.A., architect. Quantities supplied:—
Oborne, J., Shaftesbury £1,260 0 0
Witt, E., Salisbury 1,230 0 0
Dolman and Harris, Salisbury ... 1,187 0 0
Tryhorn, P., Salisbury 1,150 0 0
Adey, W. H., Salisbury 1,125 0 0
Young, E. and Sons, Salisbury ... 1,113 10 0
Wort, J., Salisbury (accepted) ... 986 10 0

Seaham Harbour.—For alterations to the police-station for the county magistrates of Durham. Mr. William Crozier, M.I.C.E., county surveyor:—
Gradon, G., and Co., Durham ... £723 18 6
Accepted.

Sheffield.—For erection of a silver-plate manufactory, show-rooms, warehouses, house, &c., for Messrs. W. and G. Sissons. Mr. J. P. Earle, George-street, Sheffield, architect. Quantities by the architect:—
Drake, H., Sheffield £2,152 0 0
Wade, G., Sheffield 1,893 10 0
Shaw, J. B., Sheffield 1,852 0 0
Bissett and Son, Sheffield ... 1,800 0 0
Chambers and Son, Sheffield ... 1,800 0 0
Chadwick and Co., Rotherham ... 1,799 0 0
Whitlock, H., Sheffield 1,760 0 0
Mastin, G., Sheffield 1,719 0 0
Rodley and Sons, Sheffield ... 1,700 0 0
Foxton Bros., Sheffield 1,683 0 0
Holmes, J., Sheffield 1,640 0 0
Fearn and Savage, Sheffield ... 1,636 0 0
Hardwick and Burton, Sheffield ... 1,590 0 0
Hirst, C., Bros., Sheffield 1,590 0 0
Garner, T., Sheffield 1,582 0 0
Alflat, W., Sheffield 1,570 0 0
Doncaster, W. and Sons, Newark 1,560 0 0
Rathbone, T., Sheffield (accepted) 1,552 0 0
Willows, T., Sheffield 1,462 0 0

Southend-on-Sea, Essex.—For the restoration of the loading pier, for the local board:—
Chafen £264 2 0
Mason, T., Southend (accepted) ... 200 0 0
Green and Burleigh 197 0 0

Swindon.—For drainage, road-making, erecting chapel, caretaker's lodge, and mortuary, &c., for the Swindon Cemetery Committee. Mr. W. H. Read, architect:—
Richens, J., Faringdon £5,642 0 0
Webb, J., Swindon 5,610 0 0
Barrett, T., Swindon 5,582 0 0
Maxwell, Liverpool-street, E.C. ... 5,450 0 0
Beavan, A. J., Bristol 5,442 0 0
Phillips and Powell and G. Wiltshire (jointly) Swindon* ... 5,393 10 0
*Accepted.

Swindon.—For making certain alterations and additions at No. 32, High-street, Swindon, for Messrs. Kinneir and Tombs, solicitors. Mr. W. H. Read, architect:—
Wiltshire £758 0 0
Barrett, Swindon (accepted) ... 743 16 0

Swindon.—For laying out the cemetery and erecting all necessary buildings, for the New Swindon local board:—
Phillips, Powell, and Wiltshire ... £5,390 10 0
Accepted.

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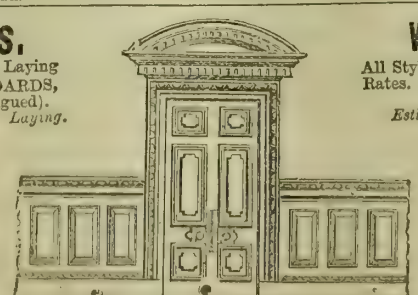

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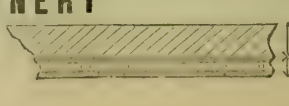


THE BUILDING NEWS.

LONDON, FRIDAY, APRIL 22, 1881.

DETAILS.

THERE is a great deal more in this short word than some people are inclined to admit. Details are often entirely neglected or set aside as only worthy of thought after the leading principle, idea or plan has been conceived and worked out. In no work is detail of more value than in that of the architect, and it is the knowledge of the value of detail that leads many architects to think so much of it, that they will hardly allow a thought for planning and general ideas. Then, indeed, details become trifling and lead to vexation and disappointment, for the general observer sees that some great point has been lost sight of, or that the work, elaborate and costly as it is, has been done in a thoughtless and objectless kind of way. The good artist never sacrifices his work in this way, and never till he has conceived a plan, strategically, so to speak, outlined his scheme and marshalled his larger masses into order, can he with patience set to work to elaborate it. The principle applies to all great achievements. Good statesmanship is the tactical accomplishment of some great measure; skilful generalship the laying down of some line of action, or effective oratory—each is the sketching out of a programme before venturing upon what may prove to be superfluous and abortive without it.

In the art-world we meet with many disheartening failures from inattention to plan and arrangement; skilful handling, costly detail, and elaborate schemes of colour are to be seen thrown away upon worthless designs. Instances of this are numerous, and may be seen in most of the art exhibitions which have grown so popular among us; but not less repugnant to the spirit of truthful architecture is the manner in which detail is shirked and made to atone by quantity for what it lacks of quality. There are, perhaps, we might more correctly say, two schools of artists—those who in their eagerness to give us the smaller graces of painting or architecture, something that the eye can rest on at leisure and be charmed with, are content to let outline, form, and arrangement take care of themselves, and those who desire only to gratify the eye by general impressions and effective proportions. These extremists are to be found in both the arts of painting and architecture; in the former, indeed, the moderation and truthfulness of a national school, whether of English landscape or genre, is threatened by them, and in architecture the same decided antipathies are to be met with among two representative factions it may be needless to mention. We may, however, for the sake of distinguishing the prevailing tenets of these parties, observe that while the romanticist is never tired of placing before us the accidental and ingenuous features of a bygone age, all the little piquancies and racy details which possess a picturesque flavour, the other is as equally persistent in upholding to our view the doctrine of an art founded on strict principles, and a model of beauty based upon the most formal academicism. These two representative notions are fully expressed in the recent correspondence which has been going on in these pages on "Baring's Bank," though they crop out ever and anon, creating a feeling of uneasiness in some minds as to the improbability of seeing a reconciliation between artists in matters of taste, and in others an abandonment of all intention of pursuing any definite course, and a simple following of the fashionable *ignis fatuus* as a matter of pecuniary policy.

The question is simply whether we should be satisfied to pick up details from the manor-houses and other buildings of the age of Queen Anne and Dutch William, and foist them upon crudely-planned structures of brick, or design our details *de novo* for their positions and uses? It is hardly necessary to point out that the architect is not required to give us the pictorial at the cost of good construction and effective architecture; his clients do not pay him to produce models for the painter so much as well-planned and sightly houses for habitation. But there is a feeling, and a very pardonable one, among architects, to snatch their buildings from the hard and rigid lines of square and compass, to impart to them somewhat of the mystery and poetry which throw a charm round works of art, and if by tacking on a gable here, and a mullioned bay, or quaintly broken sash window there, they can give to a new building a little of the *naïveté* and artlessness of old work, they do not hesitate to employ these means of rescuing their designs from the prim and stereotyped order of the modern builder. Yet there are many who do not stop at the suggestiveness this kind of licence offers, and to these we chiefly address a few words of counsel.

All good detail, if it aim at something more than the mere desire of fussiness, ought to be congruous, suitable alike to the materials of the locality, and to the character of the work. Yet it is remarkable not to find some inconsistencies, as when we see the brick and timber of the West, the "post and pan" work of Kent and Sussex, with their overhanging stories and timbered gables, grafted upon a stone building in Yorkshire, or in the sandstone districts, or details only suitable to brickwork reproduced in hewn-stone. The force of copying has led many followers of the Late Gothic and Queen Anne to introduce into their brick buildings windows and other features which could only have arisen in stone localities; and we take the mullioned window as an instance of this. We have now repetitions of such things as stone mullions and other wrought stonework inserted in brick and timbered buildings, and many mixtures of stone, brick, and timber in the same building. But the details are borrowed from all localities of the most strangely opposite character in geological formation. Thus we have brought together, often in the same design, the monolithic or severely massive oriel or bartizan, common in the strongholds of the Border, with the more playful casements and timbered fronts of the South, and the equally rich brick and plaster details of Norfolk. All these are sometimes combined as if they were indigenous to the soil and grew out of the actual wants of the case. Fourteenth-Century, Tudor, Stuart, and now Hanoverian tastes are thrown together promiscuously to give variety, for it has become almost a recognised mark of culture among many to vary the detail as much as possible. What a perverse taste is it which leads to the juxtaposing of one of the dignified bays of Audley End with a half-timbered Tudor or Jacobean gable, or the grotesque plaster-work such as we see in the groups of old houses at Ipswich and other East Anglian towns! Nor less important is the right placing of details, and this too is much disregarded. How often we find carving introduced in parts of a façade where the eye cannot discern it, and windows and oriels occupying positions which were never intended by the original authors of them. The old builders in stone and brick were always careful to preserve a due proportion in the elaboration of their ornament, so that none of their detail was expended in positions uselessly, but the modern architect looks upon transposition of borrowed features as one of the privileges of his craft, and thinks lightly of the rule of gradation which the Classic and Mediæval artist alike obeyed. In the matter of cornices, dentilled and plain, and brick chimneys and gables of cut and rubbed work, *nonchalance* seems at least to be counted a merit. There is some excuse for fine carving, moulded and dentil work in parts exposed to the outlook from upper windows, but in places where the eye cannot reach it is vain and useless labour. In such positions relief in terra-cotta suggests itself as the most reasonable among all modes of decoration. All the better examples of brick and timber houses, as the "Wheatsheaf Inn," Tewkesbury, and those of Coventry, afford instances of a studied regularity and gradation in the overhanging stories, and the delicacy of carved ornament which lead up to them, of which Ford's Hospital in the latter town affords a typical specimen. That details should be in one key appears to arise naturally from the above proposition, a principle spoken of by many architectural writers under the name of rhythm or eurythmy. The advantage of scale also follows—namely, the relation of the main to the subsidiary members or details of a building; and touching this point, we might instance the frequency of details of heavier calibre inside than those on the outside of a house; hall-cornices, for instance, of less boldness than those of drawing-rooms; and mouldings round outer openings more replete with members or ornament than those round the finished details of the interior. The distribution of detail is another matter about which much that we see nowadays shocks our sense of fitness. One will put all his ornament in a corner and denude every other part of his work; another will equally violate artistic sense by distributing it uniformly all over a façade or piece of wall without considering the value of plain surfaces for the eye to rest upon, or that an even distribution of detail is wearisome and painful in the extreme. The Japanese artist in his surfaces hits the happy medium; the machine-covered diaper is the perfection of the latter.

Apart from the general artistic considerations we have thrown out, details naturally must be regarded in a more practical sense. The qualities of some stone to receive a high degree of finish, and of others a rougher tooling in rigid flat surfaces, must to some degree at least influence the architect in his choice. In brick and woodwork these qualities are less marked, yet exist to an extent which requires the watchful attention of the designer. Details depend much on the preparation of the specification and bill of quantities, and in contract work, unless these are full and explicit, the building is sure to suffer from this cause. Unless the labour on the stonework is fully taken, the builder is apt to satisfy himself of the kind of details wanted by looking at the general drawings prepared to a small scale, and pricing accordingly. In taking off quantities for details of this kind, sketches of the sections are important, but the proper plan for all intricate details is to make large-scale or full-size drawings. In the case of brickwork the same necessity exists to give details with every necessary description, as in cornices, chimney-courses, moulded strings; and much bad and indifferent work results from not measuring the extra labour to moulded or dentil work.

According to the system of contract details are looked upon in the light of a kind of packing, and the price is regulated by cutting down or adding thereto. The time was when architects designed their details and workmen executed them, and they were paid for by the actual results; but now they are, in the large majority of cases, left to

the tender mercies of contractors, clerks of works, and chance. They are now estimated for by the lump sum, and the architect is not always sure that what he devises will be carried out in the fulness and spirit he intended. For these reasons details have lost much of the significance they formerly had in the estimation of the architect. If we turn to the details of joiners' work and ironmongery, as carried out in the ordinary villa residences, we shall find that they are virtually handed over to the contractor, or those who supply the articles. Another of the causes which have operated to destroy the character of details of joiners' work, ironmongery, and plasterers' and decorators' work, is that these matters have been relegated also to specialists and manufacturers who make a trade of them. Division of labour has forced the existence of specialists into the field, and it is useless to say we have not benefited in some degree from the fact. Unfortunately, the architect who grudges his labour in the preparation of necessary details has much to answer for. The trade "price list," and the manufacturer's catalogue with illustrated designs cut and dried, are the natural results of a system which makes the architect more and more of the supervising agent, and less of the actual architect or master workman of the building. There will always be found conscientious men willing to take the whole personal responsibility of every detail, and to supply the necessary drawings for them, and others who prefer to take a percentage for acting as the agent between the employer and the various tradesmen and manufacturers. Labour and skill are required in the exercise of the former; it is the want of these capabilities which has so swollen the ranks of pretenders who like to act the *rôle* of the architect at the cost of manufacturers.

ART EXHIBITIONS AT RICHMOND AND WHITECHAPEL.

THE Industrial and Fine Art Loan Exhibition, opened at Richmond last Wednesday by the Duchess of Teck, has been thoroughly well organised by the committee. The exhibition is something more than a mere collection of articles of workmanship by working men and women; it is besides an exhibition of an instructive and attractive character, devoted to works of high art on loan, many of the objects being contributed by manufacturers, noblemen, artists, and connoisseurs. Money prizes, medals, and certificates are given for the best work in the various classes of the industrial section, which include mechanical models, artistic workmanship, fine art, ceramics, textile fabrics, &c.—the work or designs of young people under eighteen years of age, and of scholars under fourteen years of age. A very hurried view of the innumerable objects of art and workmanship brought together is quite inadequate to do justice to them, and we may therefore confine our remarks to the notice of a few objects in the artistic and fine art divisions of the collection, beginning with the industrial part. One of the first things which strike us in entering the large room is a case of artistic work in gold and silver. No. 77 is an example of the freedom and spirit of an amateur's work, and how far removed such work is from the manufacturers' in point of artistic freshness. Here is to be found a silver clasp, a pendant, teaspoons, and rings, designed after old work, in a thoroughly true spirit, and hammered out of gold and silver coins, by W. Duppa Crotch, the nephew, we understand, of the eminent organist. The designs of the teaspoons and pendant are exceedingly elegant, of antique shape, and the workmanship of the finest description. From these we pass to several other exhibits in jewellery, panels of hammered ironwork, and many specimens of wrought metalwork in bronze, lead, and steel. The cabinet work will be found to repay inspection. W. Aumonier exhibits a few admirable specimens of his carved work. We particularly draw attention to a group of objects at the farther end of room, consisting of two oak columns from Mr. Norman Shaw's design, with carved figures round the lower end of the fluted shafts and an oak pilaster in the Italian Renaissance style, a very fine piece of workmanship. The panel, with figure in relief carved in pear-tree is a masterly work, and is from the design of Mr. Lewis F. Day. A deal panel, with a vigorously-carved swag of fruit and foliage, is clever. We notice in this part a chest of drawers carved in oak, which we have seen before, by O. R. Plummer, another skilful carver. Specimens of turnery and fretwork, showing remarkable patience and labour, are to be seen. We need only mention a birdcage in fretwork by A. C. Lane as an instance of mechanical manipulation. Specimens of joinery are exhibited by C. Pennington, and two chimney pieces executed partly by hand by R. W. Gould.

Terra-cotta and other modelling is represented by specimens exhibited by A. G. Atkinson, A. Beck, Miss S. Blake, J. Knowles, R. A. Skeen, G. Halse, and others. The oil-paintings comprise many creditable performances. Duppa Crotch sends Islands of Ischia and Procida, and other foreign subjects; G. C. Blatchley some studies of firs at Hampstead, Annie G. Stanham a few flower-pieces, Frances F. Chancellor three sea-pieces, H. P. Turner, in 260, gives us a study of a "Pilot going out to Signals," Mrs. Older a view of Venice; but we pass these and many more with the thought that some of their artists have begun at the wrong end, preferring copies to studies from nature. The water-colour drawings are numerous. We can only call attention to one or two remarkably clever instances of work by a young student, Ernest Limpus, in Nos. 405 and 406, one a sketch of a glade, exquisite in its fine rendering of spring foliage, light and shade, and another "Mischief," in which the head of the bird is drawn with much truthfulness and expression. This young artist is one of the pupils of King's College. No. 409, by Constance de la Motte, is another skilful study. The table of models in cork, cardboard, &c., is interesting. F. G. Case, J. Bates, G. Wild, C. Reed, J. W. Avery, and others send specimens of their handiwork; we also note a model of fireproof building by G. Burchett. A model of dwelling-house, in alabaster, by J. Bates, is noteworthy as an example of elaborate detail, though we cannot say much for its design, and the labour is misapplied. Architectural and mechanical drawings are numerous, and many show a praiseworthy effort in design and colour. Arthur Hinds, Constance Flint, Duncan Caddy, H. Churchouse, J. Maroney send drawings and copies of merit. Needlework in coloured filoselle silks of Indian design, lace and crewel-work, crochet, and other ladies' work are largely represented. We can only glance at the drawings from the flat in pencil, chalk, and colour executed by scholars under fourteen years of age; many of these are satisfactory as evidences of youthful attempts. Drawings from models, architectural drawings, pen-and-ink copies, illuminations, are too numerous to mention.

If the industrial section shows what may be accomplished by perseverance with little or no training, the section devoted to the exhibits on loan strikingly indicate to what excellence such untrained skill may attain under direction and guidance, and we are glad to see the committee have brought together both classes of workmanship. The amateur working artist is thus enabled to compare his handiwork and design with works of acknowledged merit, and as a school of instruction, the loan collection seems to be almost a necessary complement of the industrial exhibition. Very choice and beautiful objects are to be found in this part of the exhibition. The oil and water colour and crayon drawings are numerous, and represent many of the leading artists of the day. The drawings by E. Burne Jones and Rossetti, lent by T. Ayres, are alone a treat. The crayon heads, 26 and 27, and the portrait of a lady, by Rossetti, 31, and his female head in chocolate crayon, are remarkable fine examples of expression and intense feeling, no less masterly in execution. Burne Jones's "Lucretia" (22), and an oil-painting, by Ridley (34), are both interesting subjects. Copies from Hogarth, and pictures by Sir Joshua Reynolds, G. Moreland, R. Wilson, W. P. Frith, J. W. M. Turner, and other well-known masters, are to be seen on the walls. No. 209, "View in Surrey," a fine landscape; a study by John Ruskin, and a masterly sketch in water-colours, "Fisherman's Home, Twickenham," by Professor Delamotte, are a few noticeable works. "The Highlands of Surrey," by E. Whymper (252), and a fine little bit of grouping and colour by Sir J. Gilbert (363), show two of our leading artists in landscape and figures at their best, nor can the admirer of pictures fail to see three remarkable water-colour drawings entitled, "May Day," by H. S. Marks, R.A., a decorative subject treated in three folding tableaux or panels. Sir E. Landseer is represented by a charming little study of a lion surprised by a python (674), and another a "Dog's Head." Nos. 470, a study of figures by Hofland, and a fine study of plums (235), by Miss Coleman, will be admired, the latter for charming colour, the half-tints, and finish. This and the fine head by Carl Haag (234) are the contributions of Professor Delamotte, of King's College—a gentleman whose taste and advice have been called into requisition by the committee. The cases of choice objects from the South Kensington Museum, those lent by Elkington and Co., some beautiful examples of gold and silver plate, repousée, chased, and other tazzas and cups; and the antique objects and jewellery contributed by Mrs. Haliburton, the stall of Lambeth faience, Doulton-ware, impasto, *pâte-sur-pâte*, exhibited by Messrs. Doulton and Co.; the specimens of ancient needlework are remarkably beautiful and instructive contributions.

Another Art Loan Exhibition, at the East-end of London, was opened last week at St. Jude's School-rooms, Commercial-street, Whitechapel, and was attended by several thousands on Easter Sunday. The most important part of the collection are the paintings lent by G. F. Watts, R.A., H. S. Marks, R.A., Sir F. Leighton, P.R.A., R. N. Chevalier, and others. In the lower room are hung several large paintings by G. F. Watts, R.A. The body of an unfortunate woman lying under the dark arch of one of the London bridges, is a masterly study of the darker side of life. The colossal figure subject, "To all Churches," by the same artist, shows the figure of Christ seated on clouds clothed with the garment of Charity, in which folds are gathered a group of children. Below is the darkened world. "Aristides and the Peasant," "Time, Death, and Judgment," an unfinished painting, and others by the same artist, may be seen; also works by E. Burne Jones, his "Saint Maria," a crayon study; "A Dryad," and "A Naiad," the last two representing the spirits of forest and water respectively, are subjects that were exhibited at the Grosvenor Gallery. Walter Crane has contributed also "Cupid," and his "Truth and the Traveller," an allegory drawn from Æsop's fables; while Hubert Herkomer, in the upper room, contributes a few fine works, chiefly studies of peasant life in

Bavaria, as "The Pine Wood," "Surprising a Bavarian Family," also a thrilling Alpine incident, of great force and depth of tone—a small picture. Eastern subjects form a large class. The porcelain and pottery includes some fine specimens of Japanese ware, Rhodian ware, cases of porcelain lent by Mr. W. H. Michael, Q.C., a case of pottery lent by Mr. William de Morgan, of the Orange House Potteries, Chelsea, including some fine lustre ware of modern manufacture. A few cases of very rich embroidery, lent by Cyril Flower, Esq., M.P., T. Brunton Morrish, and others, add to the art value of the exhibition, which closes to-day.

THE LEASES BILL.

A BILL to amend the law relating to leases has been brought into the House of Commons, and has already passed through several stages satisfactorily. It is backed by the names of Messrs. Davey, Gregory, Lewis, Chitty, and Torrens. The first four of these are practising barristers and solicitors who, whether Liberals or Conservatives, are agreed that the law as to leases needs amendment, while the fifth is a gentleman well aware of the importance of the question to all men of business. It will be remembered that in the early part of last year this subject was much discussed. There was also a large meeting of influential solicitors in London who strongly condemned the existing state of things, and passed a resolution supporting proposals that were at that time before Parliament. A Bill was then in the House of Commons, promoted by the late Sir Henry Jackson, who had taken up the question formerly advocated by Mr. Masten. But the great point to be noted in all these facts is that lawyers themselves are convinced that the present system is unfair and unjust. Considering the Conservative tendencies of the legal profession, and bearing in mind that from their practical experience they are best able to judge of the hardships resulting from the law as it stands, their testimony is an unanswerable argument in favour of reform.

We need not dwell upon the importance of the whole matter to every man of business, and especially to builders and others, closely concerned in all that affects house-property. It is in London particularly that the evil is most prevalent, for, somehow or other, lessees in the great provincial towns have been more wide awake to their own interests. By what is called the "common form" of lease amongst us, the lessee is made to sign a deed containing all sorts of covenants, the penalty for breach of any one being forfeiture of the lease, and a right of re-entry to the lessor. The covenants are generally that the lessee will pay the rent reserved, will insure against fire, will do certain repairs at certain times, will not assign or underlet without leave, or carry on any obnoxious trade, or use the property otherwise than as a dwelling-house, with many more similar provisoes. Now it is evident that these covenants are of varying importance; yet leases have been so cast into an iron mould by custom that in many instance the same penalty of forfeiture is made to follow upon the slightest breach. In cases of forfeiture for non-payment of rent upon the proper day, or within the time limited, the Court of Chancery long ago interfered to grant relief. The older Lord Chancellors, when administering equity, thought it monstrous that the lessee should lose his property for such a cause, and they, therefore, held that where he was ready with his rent, and with all costs and expenses that had been incurred, the lessor should not be allowed to use his power of re-entry, although the covenant had, strictly speaking, been broken. But here the Court of Chancery stuck fast, and would go no farther. The reason of this is best stated in the words of Lord Eldon, who laid down the rule in Equity to be that "the Court would not relieve against breaches of covenant, except in cases where payment of money is a complete compensation, and will put the party in the same situation as he would have been in had there been no breach." This narrow view of the powers of Courts of Equity has held good down to the present time, for it must be borne in mind that these courts are as much bound by precedent and authority as are those of common law. Yet it is obvious that in the case of repairs, for instance, the lessor could, by a money payment, receive complete compensation. However, the line had been drawn by authority, and so it has remained to this day. It is true that an Act, passed by Lord St. Leonards, gives the Court power to grant relief where forfeiture has arisen through the omission of the lessee to insure against fire; but even this is hedged around with many precise precautions, and can only be used upon one occasion. Such is the law now; and when we remember that lessees are often entirely at the mercy of ground-landlords, that mortgagees, and all assignees of the term, are equally bound by the covenants, it seems strange that such an anomaly should have been allowed to last so long; but, in truth, the larger landlords seldom use their wide powers, or they would before this have been abolished, while tenants of smaller properties have little influence in the Legislature.

The Bill now in the Commons proposes a remedy that is at once short, simple, and sufficient. It does not invalidate the ordinary covenants or put an end to the right of re-entry for breaches. But it enables the High Court of Justice to give relief in every case of forfeiture in its discretion, and upon such conditions as it may think fit. This is done by a provision that, in any action brought by a lessor to enforce his right of re-entry, or where he has re-entered without an action, the lessee may apply to the court for such relief. The court will either grant or refuse the relief, having regard to the proceedings and conduct of the parties and all the other circumstances, and, in case of relief, may grant it upon such terms as to costs, expenses, damages, compensation, penalty, or other matters relating to the breach as may seem desirable. It would be difficult to give the Court a wider discretion, and when it is considered that most judges are, from their training and ways of thought, inclined to the landlord's view, there need be no fear that the interests of lessors would suffer at their hands. This section is to apply to all leases made either before or after the Act comes into operation, and notwithstanding any stipulation to the contrary; but it is not to affect the lessee of licensed premises who has been convicted of an offence, the repetition of which would entail their disqualification—an exception that seems only fair and reasonable. Neither is it to alter the law relating to forfeiture and relief for the non-payment of rent, which is satisfactory enough as it now stands. In one case the Bill does propose to render a proviso for re-entry and forfeiture totally invalid, and to this no fair-thinking man can well object, seeing than no injustice can result. This is where the lease makes it a ground of forfeiture if the lessee does not employ the lessor's, or some other particular solicitor, to prepare an assignment or under-lease. The only object of this covenant is to insure to certain lawyers a perennial source of profit in the estate; and if it has any other, this is met by the proviso that the lessee shall give the lessor notice in writing of every such assignment, with full particulars, within three months afterwards. There is another section protecting the mutual rights of several tenants under the same lease, into which we need not now enter in detail.

The great aim and object of the Bill is to prevent that snapping at a forfeiture which is more common than some suppose, and is the cause of gross injustice to lessees, and often to those who take under them, and are wholly ignorant of the covenants they have made and broken. The Court granting relief may be trusted not to deprive any landlord of his real rights. In cases of repairs, for instance, it could order the work to be done as a condition precedent; where there had been underletting there might be damages awarded, or an injunction to give the sub-tenant notice to quit as soon as possible. Even in the case of altering the premises, or carrying on an obnoxious trade, an injunction would be sufficient; for, should it not be at once obeyed, the forfeiture would not be relieved, and the lessor would re-enter upon the breach of covenant without any interference from the Court. We fail to see how any hardship could result from the proposed amendment. It is admitted that the present harsh law is seldom used; lawyers themselves confess that it urgently needs reforming. There is also one further point in favour of the Bill, which is that, should it pass, all leasehold property would improve in value, and so become safer as a security.

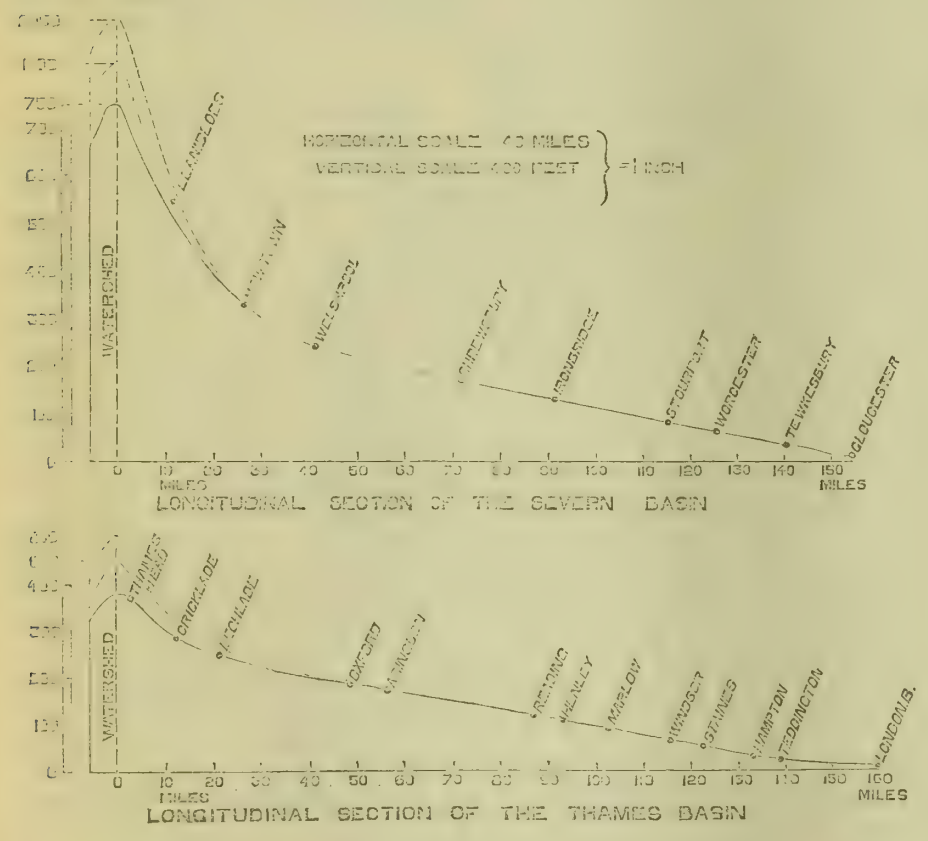
THE WATER QUESTION.—VII.

A GREAT flood in a river, in its upper part, where it is no bigger than a brook, albeit a large one, is from 12 to 24 cubic feet of water per minute per acre of the few thousands of acres of ground above the point of observation, and from which the water flows; and sometimes it is as much as 30 cubic feet per minute per acre from relatively small areas. Excessive rainfalls are but partial in their extent over large river basins. These quantities are known because it is here, in such situations, on the high ground within some few miles of the extreme watershed, and within the few thousand acres of the upper part of a river basin, that reservoirs are made for the storage of water for the supply of towns and for compensation to mills, and, formerly, for feeding the canals in dry seasons; and these reservoirs have afforded opportunities for measuring the flow of large quantities of water proceeding from known areas of ground. When a reservoir is full the flood may be measured by the quantity going over the waste weir, and that passing at the same time through the outlet-pipes, and when the water in the reservoir is considerably below the top water-level on the commencement of a heavy rainfall, and the height is known at which it stands in the reservoir, the quantity of water flowing off the ground is measured by the capacity of that portion of the reservoir filled up in the time observed, and as it is usually known what quantity of water is contained in each foot in height of the water-level, the volume of the flood is at once ascertained. If the volume of flood-water per minute be measured at various points on the course of a river between the watershed and the outfall, it will be found to be much greater in the upper part of the basin than in the lower, per acre of the drainage ground down to the point of observation. Within these areas appropriated to the filling of impounding reservoirs with flood-water, within, that is to say, an area of ten thousand acres, the volume of a flood may be from 24 or 30 to 12 or 15 cubic feet per minute per acre; but at the outfall of a river a great flood is not more than 1 or 2 cubic feet per minute per acre, as may be seen from the few instances following.

The area of the Thames basin, above the tideway is 3,676 square miles, which is 2,352,640 acres. Mr. Hawksley estimated

the maximum flood in the Thames, in his evidence before the Water Supply Commission, at from 20,000,000,000 gallons in a day to 25,000,000,000, which would be from 2,222,222 to 2,777,777 cubic feet per minute; and if we take the mean of these two quantities it would be 2,500,000 cubic feet per minute, or 1·06 cubic feet per minute per acre; or if we take the extreme quantity it would be 1·17 cubic feet per minute per acre. This is at a distance from the source of about 100 miles, not following the windings of the river, but a general line down the valley.

At the Albert Bridge, near Windsor, Professor W. C. Unwin gauged, in 1875, one of the highest floods which had occurred there for many years. The quantity was 14,094 cubic feet per second (*vide* Minutes of Proceedings Inst. C.E., Vol. XLIX.), or 845,600 cubic feet per minute. Mr. Unwin does not state the drainage area to that point of the river, but tracing upon the map of the catchment basins, to which allusion was made in a former article, a line from that point to the watershed on each side of the river, dividing off the lower portion of the area, there



LONGITUDINAL SECTION OF THE SEVERN BASIN

LONGITUDINAL SECTION OF THE THAMES BASIN

appears to be a watershed area down to that point of 1,700,000 acres, and according to this the quantity would be ·5 cubic foot per minute per acre, very nearly. The distance down the valley is about 80 miles.

On the Severn, at Worcester, the late Mr. E. Leader Williams, the engineer to the Severn Navigation Commissioners for many years, gauged the highest flood he had known there (*vide* Evidence, Rivers Conservancy Commission, 1877), and the quantity was 24,107 cubic feet per second, or 1,446,420 cubic feet per minute. He does not state the watershed area, but measuring this in like manner to that above mentioned, there appears to be as nearly as can be thus made out 2,000 square miles, or 1,280,000 acres, which gives 1·13 cubic foot per minute per acre. The distance down the valley is about 90 miles.

On the Nene at Peterborough, where the drainage area is, according to Mr. Beardmore's tables, 620 square miles, or 396,800 acres, Mr. W. Shelford stated to the British Association at the Dublin meeting in 1878, that a great flood there amounted to 8,000 cubic feet per second, or 480,000 cubic feet per minute, which would be 1·2 cubic foot per minute per acre of the drainage area. This is at about 50 miles below the extreme watershed.

On the Witham, Sir John Hawkshaw reported to the Drainage Committee in 1877, that the area draining into the river at Boston (at the Grand Sluice) is 504,000 acres, and that the quantity of water in floods to be provided for during periods of continuous rainfall would be 318,000 cubic feet per minute, or ·631 cubic foot per minute per acre. This is at about 60 miles below the extreme watershed.

On the Shannon, at Killaloe, it appears, from a paper read by Mr. James Lynam before the British Association in 1878, that the area of the catchment basin is 4,000 square miles, or 2,560,000 acres, and Mr. Robert Manning said that the maximum discharge there was 1,600,000 cubic feet per minute. This would be ·625 cubic feet per minute per acre. The distance from the extreme watershed is 140 miles. Mr. Bateman said of the same river, before the Water Supply Commission, that he had had occasion, in investigating the inundations there, to ascertain what was the maximum flood to be provided for in all the rivers in the basin of the Shannon, and from information which he received from Mr. Forsyth, the engineer of the Board of Works, who had paid much attention to the subject, and from his (Mr. Bateman's) own measurements of the maximum floods in several parts of the Shannon, he found that 1 cubic foot per minute from each acre is a very considerable flood, and that there is no river falling into the Shannon, even where the volume of the flood is not checked by any lakes, which very materially modifies the amount of flood. There is no river which sends down more than 1·54 cubic foot per minute from each acre of ground.

Mr. James Dillon read a paper at the meeting of the British Association before

mentioned, on works he had carried out on the Upper Inny river, where the area of the catchment basin is 273 square miles, or 175,000 acres, in which he said that he had measured floods there of ·4896 cubic feet per minute per acre, being nearly the same as the flood gauged by Mr. Unwin, at Windsor.

The largest estimate we know of which has been made of the probable quantity of water which might be produced by a maximum flood at or near the outfall of a river is that made by Mr. Bateman in respect of the Severn at Gloucester, which was two cubic feet per minute per acre of the drainage ground.

There is a reservoir at the head of the river Churnet, in North Staffordshire, which was constructed solely for the purpose of compensation to mills for the abstraction of springs elsewhere, which formerly flowed into the Churnet. The watershed area is 6,500 acres, and notwithstanding that all the water passes through the reservoir, the waste weir was made only 60ft. long, while the greatest depth of water was but 40ft., and the area of the reservoir about 40 acres. It was, therefore, soon filled up, and while it was full, on the 7th of August, 1862, a flood occurred, which rose upon the waste-weir to the height of 4ft. 6in. This, of course, is a depth far beyond any depths which have been experimented upon for the purpose of ascertaining the quantity from the observed depth; but as the weir had a clear drop of from 1ft. to 2ft., and the waste-water course sloped away from the weir rather steeply through the end of the bank, it may not be inappropriate to the occasion to apply a co-efficient of ·5 in the equation.

$$Q = c \times 5\tfrac{1}{3} \sqrt{d} \times ld$$

in which

c = ·5, the co-efficient,
d = 4·5, the depth of water,
l = 60, the length of the weir,
and Q = the quantity in cubic feet per second.

This being so,

$$Q = \cdot 5 \times 5\tfrac{1}{3} \times 2 \cdot 12 \times 60 \times 4 \cdot 5 = 1526.$$

To this must be added the quantity going through two outlet pipes, one 3ft. diam., and the other 18in., which together would discharge 250 cubic feet per second, making in all 1,776, or 106,560 cubic feet per minute. The drainage area is more than 6,500 acres; but as there were within the area, above the reservoir, a small reservoir and two mill-dams, which together had belonging to them about 500 acres, the area to be taken for the flood-ratio should be 6,000 acres, and dividing the number of cubic feet per minute, as above stated, by this area, the quantity would be 17·76, or, say, 18 cubic feet per minute per acre.

Thus a great flood, reckoned per acre of the ground from which it flows, varies much between the upper and the lower portions of a river-basin, if in the latter case the whole river be gauged; but for any separate smaller area near the surface the quantity per acre would, of course, be much greater, and might to some extent resemble that proceeding from an equal area in the upper part of the basin, in some rivers, but not in all, as may be seen in the two following diagrams. In those characteristics which influence the magnitude of floods, no two rivers of nearly the same length could differ more than the Thames and the Severn, in the upper-third portions of the watershed areas above the tideway, although for the lower two-thirds the respective falls are not very dissimilar, being in the Thames rather less and in the Severn rather more than 2ft. per mile for 100 miles above the tideway, as may be seen from the following diagrams, the scales being the same in both.

Referring to diagram No. 1, if a position be taken up at a point either on the upper branch of the Severn, or on the Vyrnwy, within an average distance of 10 miles from

the watershed, it will be at a height of about 500ft. above the sea-level. The watershed is, on the one hand, 1,550ft. above the assumed point of observation; and on the other, 1,250ft.; and between these two great general heights of watershed there is a pass which is 250ft. above the assumed point; and the length round that watershed is more than 50 miles, and its average height may be about 1,100ft. above the point mentioned. Thus, then, the surface is very steep, and the rain-water descends in streams, which fall 500ft. or 600ft. in the first 10 miles; in the second 10 miles, 200ft.; in the 3rd, 120ft.; in the 4th, 60ft.; in the 5th, 30ft.; and forwards to Worcester, a distance of 80 miles or so, the fall is a little more than 2ft. per mile: that is, the general rate of inclination of the valley, but the river itself varies in different parts of its course both above and below that average, having in some parts accumulations of gravel and other *débris*, and in others hard benches of rock across its bed.

The Thames falls but 110ft. in the first ten miles, taking a general average of its branches; 67ft. in the second ten miles; 37ft. in the third; 22ft. in the fourth; and forward to Teddington the average fall is somewhat less than 2ft. per mile.

The ground in the upper part of the Severn consists of the hard impervious Silurian rocks. The Thames comes from the oolite and other pervious grounds in the upper part of the basin, running over a tract of Oxford clay, and then crossing the outcrops of the greensand and chalk, the area of these permeable strata being two-thirds of the whole area of the basin above the tideway, and as they absorb a great deal of the rainwater and give it out gradually during dry seasons, the stream is comparatively strong all through the summer. The Severn is soon up and soon down, but in the Thames there is a more even flow.

It is very important to regard floods with reference to their frequency, as well as their magnitude. A few examples of maximum floods are given above, but they are such as occur very seldom, and mostly in winter, while floods of less magnitude and greater frequency do more harm in the long-run. Mr. James Lynam said (British Association, Section G, 1878) of the Shannon floods, that the small floods had occurred every year and in every month. They kept the land saturated and cold during March, April, and May, which prevented the growth of good grass, and promoted the growth of sedge and weeds. The herbage grows only late in the season, and is late coming to maturity, and the mowing of the crop is thrown back into the rainy season. In the large flat meadows there are three qualities of land, one letting at £2 to £3 an acre Irish, which would be at 24s. to 36s. an acre English, the second letting at £4 to £5 per Irish acre, the third letting at £6 to £8 an acre. The difference in the values of the meadows results, not from any difference in the soil itself, but from a difference of the levels of the lands. The lands of the highest rents are 9in. to 15in. higher than the others, and are above water a month earlier in the spring. The sedgy, weedy meadows are the lowest by some inches, and are saturated longer than the others. The kindness of the soil of these is evinced in many places, for on examining it closely, numerous plants of clover, and some fine species of grass are seen, healthy, but small and distant; and if these lands were freed from saturation during spring, summer, and autumn, the clover and fine grass would flourish and extend.

Mr. B. S. Brundell, in his evidence before the Rivers Conservancy Commission in 1877, said that on the river Don the works he had carried out there would not prevent the land being submerged by such a flood as occurred in July, 1872, but it was safe against the vexatious smaller floods which used to occur frequently; these works keep the water off the land in four or five out of six floods.

QUANTITY-SURVEYING.*

THIS manual, just published by Mr. John Leaning, professes to give a comprehensive view of one branch of the architects' and surveyors' practice, and presents a systematic treatment of the most generally received modes of measurement and valuation. We may, at the onset, inform the reader that the author, in a concluding chapter, alludes at length to the discussions that have been so rife of late years at the Institute of British Architects, the Institution of Surveyors, and which have recently been revived in these columns, on the question of the legitimacy of the architect taking out his own quantities. The result of the Conference of Architects in 1871, and the report of the special committee on the varied opinions obtained are given in full. Mr. Leaning refers to the list of propositions read by Mr. Arthur Cates, and which embodies in a summarised form the leading points of the matter; and it is satisfactory to find the writer endorsing the views of that gentleman, suggesting considerations which may lead his readers to make up their own minds on the question. One of the strongest reasons in our mind that can be urged against the practice of architects taking off his own quantities, is advanced in the following passage:—"The student should first decide whether he will be an expert architect, or an expert surveyor: the average man cannot be both. The standard of attainment, in all professions, is steadily rising, and all are tending in the direction of division into special branches. The varied knowledge and accomplishments in which the capable architect should excel, leaving out those parts of the work of the profession which are gravitating in the quantity surveyors' direction, are very great and calculated to heavily tax the powers of the finest minds. Further, an expert quantity-surveyor is the result of long-trained and diligent attention, such attention as the majority of architects cannot afford to devote to that branch of the work, and it is worth the consideration of the profession, how much of the success of our leading architects is referable to the fact of their association with capable quantity surveyors, in whose ability and rectitude they have trusted, and thus left themselves free to carry on the more essentially architectural part of their work." One of the pleas, urged in favour of the architect taking out his own quantities, is that it is a good practice for a young man, and that it will teach him construction. Few will deny the advantage; but, as the author points out, the main value of the bill is to save owners and builders loss; and, as to learning construction, it is better learnt from other sources, and before the quantities are prepared. Analogously, it may be said the making of prescriptions is good practice for the medical student; but, in both cases, experience may be bought too dearly at the expense of the patient and proprietor.

Mr. Leaning's treatise opens with some useful remarks on the value of quantities when properly prepared, and the questionable honesty of those who, to save cost, think they can dispense with them. If an estimate is to be a fair calculation of the value of a building, it must be based on a complete enumeration of the various items, whether these be great or small, and if contract drawings and specifications are to be worked to, it seems only honest that the employer should get a tender for neither more nor less work than is included in those documents. It is not necessary to say more for the practice of making the quantities the basis of the contract, so that any variations, additions, or omissions may be made to the building at the price quoted in the deposited bill. We find the author giving a few rules for taking dimensions in a proper order; such as the advantage of taking the length, breadth, and then the depth in consecutive order; the collection of dimensions from a particular angle of the building, and in one direction; the taking the longest dimensions, and afterwards the voids instead of piecemeal; the elimination of all chance of error by using only one scale, and the careful noting, in "waste" of the dimension book, the several smaller dimensions which make up a large one. A great source of error, no doubt, arises from an imperfect examination and comparison of the several drawings at the beginning, and the querying of any doubtful points, especially in checking dimensions on the figured plans. It is a good plan, as the author says, to number in pencil the rooms, and make a rough tracing of the plan, so as to identify the items relating to any. Referring to deductions of openings, it is certainly better to make reference to them when the finishings are being measured, than to take them again, as is very often done, and the practice of drawing a short pencil-line across any window or door-opening that has been wholly deducted, or over the outer facings, as the case may be, is one which careful quantity surveyors adopt as a check.

Mr. Leaning adopts the system of taking off work in two divisions. 1st. The construction or carcase, comprising excavator, bricklayer, mason, slater, carpenter, &c. 2nd. The finishings, comprising joiner and ironmonger, plasterer, glazier, painter, &c., in preference to the older method of taking off each trade separately, keeping the dimensions of each distinct. The latter certainly is the method which is still followed by many surveyors, and seems to be the most natural and orderly, and we think it less troublesome and conducive to error, as the labour in abstracting is greatly saved. It is true the separation of the items of any particular piece of work is more difficult when the trades are separated, but the facility this method gives in writing the bills is so manifest that we are inclined to think it overbalances it disadvantages. The order of taking off by either method is furnished by the author, and copious examples are given. The tables showing the order of proceeding will be found of much service to the young surveyor, and such a list ought to be carefully consulted wherever quantities are taken out. For brickwork, &c., to the carcase, the following is the order of the main divisions recommended:—Carcase, including digging to trenches, footings, strutting and planking, projections of chimney breasts, &c.; then fire-openings, including flues, hearths, stoves, and settings, coppers, skewback cuttings; then internal openings, beginning with upper story, collecting or averaging all openings where possible. Next facings: external openings, beginning from the topmost story, pavings and sundries. Many surveyors would think the above course rather confusing, as mixing up much of the carpenters' and smiths' work. The plan, however, is frequently followed, and may be usefully consulted. We may incidentally say here that every surveyor has his own method of procedure; nor does it appear necessary to follow any one plan of taking dimensions so long as some methodical line be adopted to prevent repetition or omission of the items.

One of the most useful chapters is that on "Modes of Measurement." The student will find every necessary direction here as to the method of measuring artificers' work in every branch, and in many instances sketches

* Quantity-Surveying: for the use of Surveyors, Architects, Engineers, and Builders. By J. Leaning, London: E. and F. N. Spon, Charing-cross.

and examples are given to show the way of taking the dimensions as in the case of trenches, footings to walls, stonework, and other details. Very clear are the directions on brickwork, and in this section we find more particulars given of the manner of taking special parts, such as extra thicknesses to walls, as plinths, deductions for openings, &c. As regards fireplaces, a moot paint, among some surveyors the author says, "To fireplaces deduct the chimney opening only. The theory is to deduct ash-holes of coppers, but it is rarely done, and in the writer's opinion should not be. The majority of deductions will depend upon the size of the joinery to be fixed in the openings. The general rule to be observed as to deductions of brickwork for internal doorways, is to allow 3in. in width, and 3in. in height, beyond the finished size of door; for external door-openings and window-openings to receive solid frames, the clear dimensions between the reveals, and between sill and head for the external part, the same width, plus 4in., and the same height, plus 3in., for the internal part." For window-openings a similar rule is practised for the outer part, but the same width, plus 9in. for the inner. Hollow walls are recommended to be measured solid as common brickwork, the thickness being stated, and the width of cavity, the ties used, and the number to each superficial yard. Works measured by the super. yard, the super. foot, by the foot run, works numbered, are clearly distinguished, stated under their respective heads, and will be found to contain every ordinary requirement. As to masons' work, the author thinks the best method of arriving at the exact value is to take out all the "labours" upon it, though it is a laborious work, and few builders take the trouble to price such work out in detail. The manner of dealing with old buildings, crediting the old materials, has not been overlooked, and a few useful directions are given for measuring them. "Squaring dimensions," always a tedious thing for young surveyors, is made the subject of a few remarks, and the importance of a second person to check, and the writing of the results in ink, are recommended. The next process, known as "abstracting," is perhaps quite as laborious and intricate a task, and the advantage of order is evident. The author thinks there is an additional element of safety if the abstracter can begin abstracting at the beginning of the dimensions and proceed with them seriatim, irrespective of trade. The practice we have followed has been to abstract one trade at a time, and this plan seems most regular. Methods are given to show how references to the dimensions may be made, and the rules for abstracting beginning with the leading items of each trade, and the examples furnished, illustrating the process, leave little for the student to acquire except practice and patience. Billing, the last process, is fully explained, and difficult items are illustrated by examples. The clauses usually prefixed to bills, from the conditions of specification, those especially likely to affect the tender, are given, and forms of tender, credits' bill, and other necessaries are added. The preambles to the various trades are suggested, and we may add no bill is complete without them.

The information afforded under the heading of "Restoration," especially the clauses of general occurrence in work of this sort, will be found of use; and the methods used to reduce tenders, by cutting down the cubic capacity or the quality of the finishings, are pointed out. Of course the dimensions must be looked through, and the bill carefully examined to discover items that may be omitted. We find a complete outline form for a schedule of prices, instructions for the adjustment of accounts, "extras," and a form for a bill of variations. The assessment of prices is treated in full in another chapter; no part of the surveyor's work is more onerous, or requires larger or more varied experience. Material and labour, and the element of profit, must be each thought of. Ten per cent. is low, and 20 per cent. a fair profit. The prices used for cubing, the methods in use for ascertaining the value of brickwork, timber, &c., are stated. The law, in its bearing upon surveyors, as disclosed by recent decisions, will be found of service in the settlement of many doubts which have often given rise to questions in these pages. Mr. Leaning's book is also rendered of more general value to the profession, by the Manchester Society of Architects' Statement of methods recommended by that body, for the purpose of facilitating the Northern system of obtaining separate tenders for each trade. Many of the methods stated differ essentially from the London practice, as in the deductions of openings, measurement of hollow walls, &c., and these have been pointed out at the end. In some cases the Northern practice is more rational. Finally, no part of the book will be more practically useful to the student than the "examples of taking off" given at the end, where many difficult points are illustrated in detail. But we have said enough to indicate the scope and treatment of Mr. Leaning's bulky little treatise, and have pleasure in recommending it to a numerous class of readers, for whose instruction the existing works, excellent as they are, are scarcely up to date.

ROYAL ACADEMY LECTURES ON ARCHITECTURE.*

THIRTEENTH-CENTURY ARCHITECTURE—FRANCE.

OUR subject to-night is one of inexhaustible interest and extent. You have gathered from what I said to you about Italy, in my last lecture, how worthy the art of this age is of our deepest and most reverent study; and that there is no branch of it which is more worthy of respect than that which pursued so active and indeed extraordinary a course in France, from the middle of the twelfth down to the end of the thirteenth century. You are all aware, no doubt, that France, as we now know it, is a country gradually compacted out of a number of states or divisions, and that it was in the thirteenth century, under two distinguished sovereigns, the saintly Louis and the warlike Philip Augustus, that the greatest strides were made in welding together the kingdom of which then, as now, the Ile de France, with Paris as its capital, was both the political and the artistic centre. The various provinces preserved, however, so much of their own traditions and tastes that each presents its own local variation of style, which was rather intensified than otherwise during the thirteenth and fourteenth centuries. The buildings of Burgundy, of Anjou and Poitou, of Normandy, of Picardy, and of Champagne, are so different in their character that in the thirteenth century a man might almost have known where he was by the aspect of the architecture. The same sort of difference that existed between the North and South of Italy is visible in the North and South of France. But in the latter, the art of the North is again divided into a number of divisions answering to the provinces. To attempt in one evening to describe all these variations would be absurd, and I shall confine myself, therefore, merely to the architecture of Paris and its neighbourhood. It is necessary, before I do this, to take you back to the twelfth century, in order that you may see what the state of French art was then, and what promise it gave of the fruit which was brought to such great perfection so soon afterwards.

The great burst of enthusiasm for building which occurred in the 11th century has left traces in all directions; and for a century before 1150 the works still remaining are conspicuous for their admirable workmanship, skilful planning, and finished detail. Without dwelling on all these points, it will be sufficient to confine ourselves to a study of their ground-plans. Here there is vast variety; but the plan which, on the whole, is evidently the most favourite, and which occurs in various stages of development in almost all parts of the country, is worth examining, because it evidently contained the germs of the great 13th-century cathedrals. In this the chevet, or east-end, is founded on the Roman and Byzantine plans, finishing with a circle around which are set at intervals small circular chapels—three, four, or five in number,—which give great variety to the plan both inside and out. As an example of these, I may mention a church of the early part of the 12th century,—Notre Dame du Port, Clermont-Ferrand,—where the covering of the aisle is a continuous barrel-vault; those of the chapels, semi-domes; whilst the central portion has a barrel-vault finished at the end in a semi-dome. The construction here is extremely ingenious. The builder had resolved that his work should last for ever; he roofed every part with stone vaults, covered outside with stone roofs, using no timber whatever in their construction. He accomplished this by giving his aisles quadrant vaults, so as to give a continuous flying buttress supporting the continuous thrust of the central vault.

What strikes one in these early churches is the resolve of their builders to make them imperishable, and the scientific disposition of their vaulted roofs, which in the chevet, owing to the combination of the aisle-chapels with the vaulted aisle, is extremely effective in perspective. The exteriors are remarkable mainly, in this case, for the use of coloured materials, and as they do not affect my argument, I omit all notice of them. One evidence of the scientific character of the buildings is that they are generally designed upon some regular system of proportion. At Notre Dame du Port, the height and width of the nave are equal, and if these are divided by four, two parts give the width of the nave, two the height of the main arcades, three that of the triforium arcade, and four the total. From first to last we cannot but be struck by the scientific and regular way in which the work is done. The same plan is seen in a number of examples, most of which—as St. Etienne, Nevers—have the improved arrangement of three chapels to the apse, in place of the four at Notre Dame du Port. The Church of the Holy Sepulchre is the venerable original of such plans as these, and its example is of especial interest, inasmuch as the eastern part of the church, built by the Crusaders, gives us the Auvergnat plan almost without modification, *vis-à-vis* to the apse of Constantine, which had precisely the same sort of outline at the western end of the building.

This common French plan of the apse is, we have seen, a development from a Byzantine original. The section of the vaults suggests the use of a flying buttress, and is, indeed, so nearly being one, that it was not a great step to develop a construction which should bring all the weight and thrust to one point, instead of equally along the whole length of the wall. This was done in the quadripartite aisle vaults, and it was only necessary to repeat them in the central vault to make the quadrant-vault or continuous flying buttress over the aisles quite unnecessary. And so gloomy are the interiors of chambers constructed in this way, that the absence of the clerestory, so long used in earlier unvaulted buildings, must have seemed, even to the men who were building them, a most serious defect, and it is not surprising, therefore, that the combination of this with a stone vault was, above all things, what men soon strove for. At the same time, in the West of France, churches were being built on plans even more obviously derived either directly from the East or indirectly from thence through Venice. Of the latter class the most remarkable was the well-known example of St. Front, Perigueux. Here, whatever the origin of the design, we have domes carried on pointed arches springing from piers which, at their base, recal completely the planning of St. Mark's, Venice, and Sta. Fosca, Torcello; and the story of a Venetian colony settled at Perigueux is not required in order to prove that the example, if not of Venice, at any rate of countries from which the Venetians derived St. Mark's, was followed there.

At Cahors, in a church founded in 1100, we see a nave covered with domes, one to each bay, finished with an apse, and three chapels of the Auvergnat type; whilst at Angoulême, at the same date, there is a nave covered with three domes, and a choir with four chapels as at Notre

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Dame du Port, Clermont, save that in these two examples, there are no aisles, the chapels opening out of the central apse, after the fashion of Constantinople and Venice.

The churches in which domes or semidomes may be found in the Centre, South, and West of France, are numberless. And it is very remarkable that, after having been so popular a feature in the eleventh and twelfth centuries, the dome should have been so entirely abandoned in all later buildings. The reasons for this are obvious. Admirable as the effect of a dome is, long experience has proved that there is no form of construction which entails so much waste of material, or such massive supports and buttresses. The French architects set themselves the task of making their buildings as light in their construction as was possible, consistently with endurance. They desired, too, to make them useful for large congregations, and they had discovered by experience how difficult it was to control the acoustic properties of a domed building. Even if they confined themselves to a central dome, the points of support were enormous masses of masonry just at the places where their inconvenience was most felt. Their common sense led them to desire the admission of light in their comparatively gloomy climate, in place of the sombre effects which are almost a necessity when the domes are solidly built of stone or brick.

As regards architectural detail in France at this early period, it is to be noticed that in a great number of buildings it was of extraordinary delicacy and beauty of execution. The three western doorways of Chartres, a doorway in St. Benigue, Dijon, the south door of the nave of Le Mans, and the north and south doorways of Bourges Cathedral, all date from about 1150. They are remarkable not only for the really astounding skill of the mechanics who wrought the curious sculptures with which their columns and other members are covered, but for the remarkable fact that among the branches of foliage, in which the utmost skill of Byzantine artists is rivalled, nude figures and animals are represented, with a feeling for nature which is all the more surprising when compared with the stiff and conventional representations of life-size human figures in the same work. Not long after these works, a cathedral was built, evidently by French artists, at Santiago, in Spain. It was a close copy of St. Sernin at Toulouse,—a vast church on the same plan as the Auvergnat examples,—and it had in its south transept doorways columns carved with just the same desire to represent the nude figure accurately as in the case just mentioned, and so well executed that if done before our eyes now, they would extort admiration from all. One other building must also be named as an example of delicacy in purely architectural work, the chapter-house of St. George de Boscherville, near Rouen. Here there is no sculpture of figures, and what is chiefly noticed is the beauty of execution, which is quite consummate. The century closes with an example of still greater excellence in the two earliest of the western doorways of Rouen Cathedral, in which the beauty of design and the perfection of the work leave nothing to be desired. I know no detail more worthy of study, and the wonder is that more work conceived in the same spirit was not executed. The only parallel work with which I am acquainted is that of the western doors of Genoa Cathedral, to which I have before referred, and in which the ornamentation is obtained by the use of black and white marble, while, in the Rouen examples, it is produced by deep cuttings in the stone. But this is a somewhat later work. The end of the twelfth century sees France, then, covered with buildings, mainly churches (though all others show the same art), built with great skill on well-defined plans, and adorned with details of really exquisite beauty. So far the work had been done with zeal, but under considerable hindrances. At first the grandest buildings were those of the great monasteries. Their designers were, no doubt, ecclesiastics, and the laity were comparatively unconcerned. But now there is a great change. The people take the matter out of the hands of the church. The architects are no longer clergy, and, supported by the suddenly-awakened zeal of the people, they form themselves at once into a body of the most scientific kind conceivable, and are every day found trying some new device for the development and improvement of their work. In a few years they had changed everything; they had discovered how to utilise the pointed arch, and this discovery seems to have been like a revelation to them. The arch itself was known long before its utility was realised. It had been used constantly for some fifty years. The arches which had to carry most weight, and whose thrust it was desirable to limit, were the first to be built in this shape. The French builders had found, no doubt, how easily a round arch becomes weakened, and how serious the results are of the least giving way of the supports. But at first they saw no special beauty in the pointed arch, and adhered to the round arch for beauty and to the pointed for strength. This fact is a good illustration of the very practical character of the French architects. They loved and admired the old form, but in face of a practical advantage it was at once abandoned in favour of the new one. When once the pointed arch had been well used, and had come to be understood, their eyes were suddenly opened to perceive the powers its use conferred on them. In a few years, from being carvers they became sculptors, and at almost a single bound, from being very moderate because very conventional artists, they became the best and most skilful designers and constructors the world has ever seen. And the artist was so careless of everything but the perfection of his work, that it is rare indeed that we know his name, or anything about the way of his life or the manner in which he set to work at the development of his plans.

The French architects at this time had emancipated themselves thoroughly, and once for all from old traditions. They found that the use of the pointed arch gave them a power in construction such as had never before been wielded. Before their time it was the vast mass of building or of wall, the great size of the single stones which composed it, no less than the art which decorated them, which had impressed the mind. Now it was seen that this was not the best way of securing the desired result. Every day attempts were made to improve the construction by making it more delicate and graceful. The sizes of the piers were reduced; windows were enlarged, and raised high up in the walls; the construction was of a most permanent kind, and yet it was all provided for with the least waste of material, so that the comparison between the voids and the points of support is made always largely to the credit of the Gothic architects, whenever it is made at all between their buildings and the works of the schools which preceded and succeeded them.

The names of the architects whose works are so familiar to all students are, I repeat, either unknown, or if we know them, that is usually about all that can be said. In my last lecture we had a great deal of personal matter, for, in Italy, you are able sometimes to follow the architect about from one work to another, and you see him now architect, now sculptor, and sometimes even painter also. In France, we know much less of the life of the artist. We have the names of a good many; among them of four architects in succession at Amiens—of Robert de Coucy, the architect of Reims, whose design was faithfully carried out by his four successors; of Eudes de Montreuil, who went to the Holy Land with St. Louis; and of many more. But were it not for the fortunate preservation of the sketch-book of one of them—a friend, probably, of Robert de Coucy,—we should know but little of their mode of life, or thought, or work. This sketch-book or album was the property of Villard de Honecort, and it brings before us an architect in the early years of the thirteenth century wandering about on business or pleasure, visiting cathedrals, making notes and sketches of them, and evidently studying how best to improve himself. He interests himself in the best way of cutting stones, of lifting them into place, of setting-out lines for work, and so forth. He sees a lion, and forthwith sketches him, putting on his sketch (a note which may be freely translated) "Mind you, this lion was alive." He draws figures and designs for sculpture; he goes to Laon and makes a sketch of one of the western steeples, and writes below it what most of us who have looked at and sketched it, as he did, would have agreed with: "I have been in many countries, as you may see by this book, but in no place have I seen a tower equal to that of Laon;" and then, after a description of its plan, he adds, somewhat oracularly, "Meditate upon these things, for if you desire to build such great angle towers you must choose a form of sufficient projection. Proceed carefully, and you will do as a wise and careful man ought to do." Then he goes to see Reims Cathedral, which is in course of building, and sketches carefully the chapels of the apse, with notes of their details. He evidently thought very well of them, and having about this time to build the cathedral at Cambrai (now unfortunately destroyed), he gives a plan of it, in which he seems to have repeated very closely the plan and design of his favourite apse of Reims. On another page he gives a sketch of a plan of a chevet or apse, which he and his friend Peter de Corbie contrived together, and, strangely enough, so new is this plan of an apse, surrounded by alternately square and circular chapels, that no example of it exists in France. If he had travelled south he might have seen his suggestions anticipated in the baptistery at Albenga, on the Riviera, whilst at Toledo some Frenchman did, at about the same time, build the chevet of the largest thirteenth-century church in Europe on precisely this very plan. In another he gives a plan of a square-ended church, almost identical with our own abbeys at Beaulieu and Byland, on which he writes, "This is a square church, which was designed for the Cistercian order." Again, he gives a variety of designs for drawing the human figure inclosed within triangles. He designs foliage, animals, a lectern, a clock-case, and so on. Then he travels,—visits Hungary on business, goes to Chartres, to Lausanne, to Meaux, as well as to Laon and Reims,—everywhere, note-book in hand, and making sketches of all that strikes him most. Curiously enough, he makes not a single suggestion in any of his sketches of any geometrical mode of arriving at the proportions of the buildings,—a very noteworthy fact, seeing that most of those he visited were either just built or in course of being built.

I have been thus particular in describing this book, because it gives us a glimpse behind the scenes of extraordinary interest. We see just how it was that these French buildings grew, multiplied, and developed as they did. The men who built them were as keen about their art as it was possible to be. They were disputing with each other as to possible new plans, new combinations, and repeating work the effect of which they thought perfect, and it is this sort of spirit which we see so actively at work in developing the French architecture on all hands, from the point to which it had slowly attained towards the end of the twelfth century.

I believe that in the time at my disposal this evening I cannot do better, first of all, than by showing you how this improvement and development was effected in the ground-plan of a French church. In most cases a good ground-plan involves the architectural design of a great part of the superstructure. In the best French churches it may almost be said that it involves the whole design. In those days every one gave his building a stone roof if it were possible. And nothing so certainly neccessitates a scientific arrangement of the ground-plan as the provision for carrying safely a stone vault. You will observe, then, that the men who had built such a church as that of Notre Dame du Port at Clermont, or as St. Front at Perigueux, had succeeded in covering their buildings with stone, but in a way which left much to be desired. And the object of each subsequent architect was to make the construction safer, or, at least, as safe, but with much more lightness of effect, and with much less waste of material. The early churches had been derived from countries in which the climate required that windows should be neither numerous nor large; and it was not until this period that architects began to realise how unreasonable such windows were in their comparatively gloomy and cold climate. The cross-vault once introduced soon led to the discovery that the use of a pointed arch was almost essential if vaults were to be strong, and adjusted to other than regular compartments. Even in the simple vault of a building whose plan is a parallelogram, the thrust of a semicircular vault is too great, and the slightest giving way of the walls on which its rests is fatal. With a pointed vault this is not the case. The thrust outward is comparatively small, and it was soon found that it might be counteracted not only by a buttress in the form of a pier, but by a section only of the old quadrant vault which held up the continuous vaults of Notre Dame du

Port and its class. The flying-buttress adopted in this way rendered it comparatively easy to bring all the thrust to one point on the wall, because it was possible so to fortify this point as to make it certain that it would not give way. Then, when this was accomplished, it became quite unnecessary to erect thick and heavy walls between the piers and buttresses, and in course of time the construction is reduced here to a mere thin screen of tracery, throwing as little weight as need be on the piers, and only sufficient to keep the weather out of the building. In France the whole of the early buildings were, as I have told you, finished with circular east ends. And it is possible almost to count on one's fingers the examples of large churches in the thirteenth century in which a square east end is seen. The most important are the cathedrals at Laon, at Poitiers, at Dol, and the Church of St. Serge, Angers, and the churches of some religious orders, as, *e.g.*, the Cistercians. Such exceptions emphatically prove the rule. Then, when it became necessary to vault these circular ends, all sorts of problems had to be met, and each man's work presents some mode of solving them different from that of his neighbour or predecessor.

The great difficulty to be overcome arose from the extremely irregular shape of every division or bay of vaulting around a circular building. In the square compartment you have an arrangement in which the arches need not be of the same height, and yet may perfectly well be vaulted with cross ribs, the ridges of the vaulting cells rising or falling to meet the arches, or being level with them. Where a succession of these vaults is required the ribs are usually semicircles, because in this way it was found that the perspective was most continuous and effective. But this was by no means always the case. Sometimes these ribs are made of such curves as will allow of the filling-in of the cells being square with the cross arches; and sometimes, as in the Angevine and Poitevin churches, these diagonal arches are pointed arches rising high above the centre of the cross arches. In this case, in the perspective half of each vault is lost behind the cross vault. It is really a most unsatisfactory sort of vaulting, and though it was persevered in for the best part of the century in the districts named, it was rarely adopted in other parts of France, and not at all, I think, in the Ile de France. In the aisle round an apse the first solution was a continuous barrel-vault. This was very easy, but certainly not beautiful, nor was it improved when cross vaulting was introduced corresponding to the openings to the chapels or arcades on either side. But when it was attempted to divide this aisle for vaulting bays the problem was found to be very difficult. Treated like the square bays, with vaulting ribs going straight from angle to angle, the effect is obviously very bad, so the diagonal ribs were usually planned so as to meet in the real centre of the compartment, though this involved a disagreeable broken line in the perspective and was not so popular as to be accepted without protest. It was probably after seeing such vaults constructed that the chevet of Notre Dame, Paris, was planned. Here, certainly, great ingenuity is shown. The apse is divided from its aisle by five arches, and this again from the outer aisle by ten, and the vaulting compartments are all as nearly as possible equal triangles on plan. You will find this form of vault used alternately with square compartments in the aisle round the circular church at the Temple, where the same problem is solved with even greater skill. In these triangular compartments of Notre Dame there is a continuous ridge of level triangular spaces, and though a single such compartment is deficient in the light and shade of ordinary vaulting, approaching, in truth, too nearly in principle to a cradle or waggon vault, of which half of each compartment is a portion, yet in so intricate a plan as that of Notre Dame no such fault can be found, for the whole plan is full of variety and light and shade. Notre Dame was completed in 1208, but the whole exterior of the chevet was greatly modified in 1296 by the addition of a series of chapels between the buttresses. I have myself very little doubt that in Bourges Cathedral we have a chevet which illustrates the probable treatment of the original chapels of Notre Dame, all of which were destroyed in 1296. Here, as at Notre Dame, the outer wall of the second aisle has three compartments for every one in the central apse; and from the centre division of each of these a small circular chapel projects. This treatment is very beautiful. It retains the windows between the chapels, which was so marked and fine a feature of the early chevets, and relieves what would be the baldness of a chevet consisting, as M. V. le Duc assumes in the case of Notre Dame, Paris, of two aisles, without any excrescences all round the chevet. The architect of Bourges made another important modification. At Notre Dame the plan involved the placing of a column in the second series of columns opposite the centres of the arches in the first series. He abandoned the attempt to make all the vaulting compartments equal, accepted the irregular plan for the first aisle, making his intercolumniations wider than in the apse, and then showed that he knew and appreciated the Notre Dame arrangement by dividing the outer wall into three, and making one bay of quadripartite vaulting, which is an exact counterpart of that in the first aisle, only reversed, and two bays of triangular shape. Below, in the crypt, the similarity to the Notre Dame vaulting is even greater. At Bourges the chevet is a semicircle divided into five exactly equal portions, and these prolonged by twelve bays westward from the church. The architect, having resolved on an immense scale, confined himself to the simplest possible plan, but gave great originality to his design by raising the intermediate aisle to such a height as to admit of its having a secondary clerestory and triforium. Notre Dame was completed in its first form in 1208; of Bourges the date is uncertain, but it is probably safe to put it at about 1220. And in 1226 the plan of another cathedral, almost the vastest in Christendom, was made, and evidently by a Frenchman, for Toledo. Here, we see that the plan of the chevet shows a double aisle, with compartments alternately square and triangular in both aisles. In this way all difficulties were overcome. The central column opposite the arches of the apse was avoided. The vaulting has no sameness, the compartments being alternately triangular and square, and the surrounding chapels are of the Bourges types, *i.e.*, very small, but alternately circular and square. The whole plan is one of the most beautiful ever devised, and it is strange, indeed, that the most magnificent development of the French plan should be in the ecclesiastical capital of Spain. Here, too, to complete the likeness to Bourges, the intermediate aisles have a triforium and clerestory, and the ungainliness which is certainly the fault of Bourges is exchanged for a design in which the most captious critic can find little to complain of. The sketching architect, Villard de Honecort, when he devised a plan for a chevet in company with Peter de Corbie, made, you will remember, one almost identical with that of Toledo.

It is impossible to do more than just touch on this branch of my subject to-night. In some future year I may, perhaps, be able to deal with it more exhaustively. The varieties of the modifications of the plan of the chapels round the chevet are very great. But the main point to be observed is, that at the beginning of the century they were all planned on circular lines, and that by the end of it they were all but in variably polygonal. In Robert de Coucy's work at Reims, we see them begun on the first plan, and finished on the other; and after his time his example was generally followed. His work was planned in 1211, Amiens in 1220, Beauvais in 1225, Le Mans in 1230, Clermont in 1248, and then all follow on the lines which he laid down, and which in a few words, had the effect of abolishing the wall and throwing all the weight on to the buttresses, so as the better to enable them to resist the thrust of the vaults. To know what French architecture was in the 13th century, it is, of course, requisite to know a good deal more than the story of the development of the ground-plans, though it is true that unless you study this part first you will never understand the rest of your subject. Now no way, I believe, is so good for to-night's purpose as to take some two or three churches for examination, and, so to speak, dissect them. Probably, of all the French churches, there are none in which such dissection is more profitable than it is in the case of Notre Dame, Paris, Reims Cathedral, Ameins, and Chartres. And if I take the last first, it is mainly because it is so perfect in all its parts, and so completely the work of one period and the effort of one man's skill and genius, that it presents an admirable subject for your study.

The original cathedral at Chartres was built in the 11th century, and a vast crypt still remains of this period. Then, in 1115, a west front was commenced, and in 1194 the whole church was destroyed by fire. The new cathedral was at once commenced, but upon the old foundations. The contrivance of the new architect, who desired to plan a church suitable for the epoch, and therefore did not choose to follow strictly the lines of the early church, is well worth our consideration. At first sight, the church of Chartres has the look of being extremely original. It is, in fact, unlike any other that I know. The chapels round the outer aisle are alternately polygonal and segments of circles. This variation seems to me to be in itself very beautiful, as well as original; but when we descend to the crypt we find out at once how it has come to be contrived, and that it was, in fact, the happy result of a necessity made good use of. The original church was burnt, but the crypt sustained no damage. It extended the whole length of the church, and the architect was compelled, therefere, to build on the old lines. Compare the crypt as it was. and the church as it is, and you will say that the compulsion did not amount to so much, so different are the two. But compare the two plans and you will see how ingenious the adaptation was. Examining the crypt, we see that the old church had an apse, a single aisle round it, and three deep chapels with spaces between them of the same general outline as those other Early French churches which I have already described. The architect of the church saw that by making a slight corbelling forward from the old base it would be possible to build a choir with two aisles instead of one, with moderate chapels over the old chapels, and shallow ones in the spaces between them. All this could be done, and was done, without any additions to the old foundations, and certainly with the happiest result, and it would be difficult to give any better evidence of the skill of the architect. The groining of the new chevet is somewhat complicated; the inner aisle is all quadripartite; the outer one has quadripartite walls opposite the large chapels, and vaults of five divisions opposite and including the small intermediate chapels, whilst the three principal chapels are vaulted separately from the aisle. In some respects this plan is similar to many of later date, as may be seen at St. Pierre, Bourges, and St. Omer Cathedral, but I think the plan of Chartres is far finer than either of these, giving as it does a beautifully curved and varied outline to every part of the apse. I am the more particular in claiming this merit for Chartres, because no less an authority than M. Viollet le Duc speaks rather slightingly of it, evidently forgetting that the great merit of the plan is that the conditions were very difficult, and that an amazingly good result was obtained in spite of this fact. Nor am I, much as I admire the plan, able to praise everything without reserve in this great church. No doubt, there were many difficulties to be surmounted; not only the plan of the old church, but the people who had to be employed on the new one. Chartres had a great religious reputation. It had then, I believe, as it has now, a black Virgin, whose power of working miracles was supposed to be extraordinary. It was the epoch of the Crusades. Men were told that to work at Notre Dame, Chartres, was as good as to go to the Holy Land. And from distant places,—from Rouen among others,—crowds of people of all sorts went to aid the work at Chartres with their hands. Such is the story; and I am bound to say that there is much in the fabric which seems to confirm it. The whole scheme was a grand one. But the material,—a very coarse, calcareous limestone, full of holes,—did not admit of any delicate work, and nothing can well be rougher than the workmanship of all but certain delicate portions, as, *e.g.*, the two transept porches. The stones are put together in a clumsy and unworkmanlike manner. Things which are meant to fit do not do so. The cornices and galleries outside are so carelessly planned as to have to be fitted to their places by taking off and curving angles, or filling them up. The work all has the air of having been executed by men who were in a great hurry, who were not used to such work, and who were entirely careless as to the goodness of the execution as long as they could manage just to put it firmly together. This sort of execution happens also to tally with the architectural details of the general design.

These are comparatively few, and not too skilful. The main columns are needlessly heavy, being about 8·6 in diameter, though the intercolumniations are only 11·7. The capitals are not well planned to receive the groining-piers and main arches. All the members are rude in their section, and the flying buttresses are not only very irregular in their design, but far in excess of what such a vault as they support ought to require. In the columns the very common French plan of four columns surrounding a central drum is adopted; but the columns are all alternately circular and octagonal, and agreeably varied by being made into clusters of small columns both at the crossing and at the responds. It must be noted also that the columns are alternately circular with four octagonal, and octagonal with four circular, shafts surrounding them. The mouldings are very few and very simple, and the capitals very plain and rather coarsely carved. The windows, too, are very large and very plain (the great clerestory windows are no less than 8ft. 5in. wide in the clear, and their only moulding is a chamfer). Finally, there is very little variety. The same design is carried on all round the church, almost without any change. But you must understand that this was all done designedly. The architect had determined to make his work depend for its effect upon a magnificent *tout ensemble*, which should be above and beyond all questions of detail. He could not but know what good work was, for the old west end and the south-west steeple had escaped the fire, and each in its way was admirable in design and detail. The three western doorways have seldom been excelled for the finished beauty of their workmanship, and the steeple is a perfect example of delicate planning and design, and he shows his own sense of what was good, for his work depended for its effect partly upon the porches of the north and south transepts, in which he has shown such a mastery over delicate detail as has seldom been seen, and this with an originality of design and a fertility of invention which cannot be too much praised. Both porches are generally similar in outline, but extremely different in the detail of their planning, which, in the case of the northern one, is very varied and beautiful. Nowhere can be seen better than here the love of variety which so much marks Gothic work. It is as if the architect had felt himself tied and bound in his scheme for the church, and found himself breathing freely again when he had to complete the porches. There is so charming and endless a variety of canopies, of shafts, of clusters of them, of figures, of subjects, that I am at a loss to find terms warm enough for my sense of their beauty. But this will, I hope, be illustrated more fully if I am ever able, as I hope, to lecture to you on the connection of architecture and sculpture, nowhere better seen than at Chartres. So far I have spoken of this typical cathedral of the thirteenth century without a word about its colour. This was not only internal. There is still evidence in the northern porch that, six centuries ago, the whole was covered with rich colour. No more strange departure from our present ideas of what is suitable can be conceived. Yet we must always remember that the thirteenth-century architect agreed herein intuitively with the Greek before him, and that both felt that the best architecture could not be the best until it had been beautifully coloured. But it is the profusion of colour in stained glass which is the most striking feature of the church. It is that by which almost everyone must be most struck, and by which, after all, they must remember Chartres. Evidently it formed part of the original scheme. The windows are all of vast size, and, in spite of this, and of their great number, they are absolutely filled with glass of extremely rich and solid colour, all of the same age as the church, and all arranged in a generally uniform scheme, though it is varied in detail in every part. The architectural features of this portion of the work which most deserve to be noted are (1) the general arrangement in the upper windows of large figures under canopies, and in the lower windows of subjects in panels; (2) the beauty of all the drawings of foliage and ornament; and (3) the fact that all the windows, rich as they are in colour, have their leading lines marked with a white line, so that if you are in the church when light is failing, you find all the openings filled with geometrical figures or tracery. The architect of Chartres was not far from using regular tracery. In the porch he does it in a small degree, and in the great circles over the clerestory he leads the way naturally for similar figures in the glass, and finally he culminates in a magnificent rose-window of geometrical tracery in the west-front. His work as it stands is perhaps the most perfect and least altered great French work of the period. It was begun, as we have seen, in 1194, and finished in 1260, and there is no evidence anywhere of a change from the first scheme during the long progress of the work. Time has dealt very tenderly with it. Few and generally unimportant alterations have been made since the dedication of the church. The whole scheme was carried out exactly on the lines dictated at the first, and nothing was left for a subsequent age to do. Compared with the puny architectural works of our own time, such an effort is simply amazing. During the same period the cathedrals of Paris, Troyes, Soissons, Reims, Amiens, Auxerre, Mantes, Beauvais, Le Mans, Bourges, Clermont, Limoges, Laon, Bayeux, Coutances, Seez, and Rouen, together with an endless array of abbeys, of castles, of churches, of hospitals, were being built. Each great cathedral must have been built by its own diocese or district, for every diocese was engaged on the same work. Yet at Chartres there is no evidence of economy or straitened means. Too great haste, indeed, is the only fault I can find evident in the execution of the work. But it was the venial fault of a city which refused to see its cathedral in ruins a day longer than was absolutely necessary.

At Notre Dame, Paris, we see the work of a very different artist, and are able to trace distinctly the great changes which have been made in the work since its first commencement. I have told you of the ground-plan already. After this, the most interesting feature is the triforium. Here, in order to resist the thrust of the main vault, the first architect constructed it with pointed barrel vaults, at right angles to the length of the church; and it is difficult to suggest a stronger form of construction. It was in this way that the 12th-century builders of the cathedral at Tournes had vaulted their aisles, and their example was copied in one church in England, *i.e.*, by the Cistercians at Fountains. At Notre Dame it was soon destroyed in favour of flying buttresses, but at Mantes Cathedral, said to have been designed by Eudes de Montreuil, not far from Paris, much of the similar construction is still perfect. It was convenient enough, and very strong in the nave, but singularly inconvenient in its application to the irregular bays of an apse; it was probably bad for sound, and expensive and troublesome in construction. It is not to be wondered at that it was soon abandoned in favour of cross-vaults spanned by light flying buttresses. There was an immediate temptation also to reduce its strength by making openings between the vaults to a dangerous extent. At Mantes these cross-vaults are carried on slight columns, on which a flat lintel is placed, from which the cross-vaults spring. The failure of one of these columns might, therefore, involve the ruin of the clerestory which the vaults buttressed. Eudes de Montreuil, I suppose, introduced this mode of supporting the central vault, and if he was also the first architect of Notre Dame, Paris, he combined it there with a second triforium arrangement, the circular windows to light which still remain here and there. This second triforium was almost necessary when the main gallery was used by the congregation, as it still is in Notre Dame. The flying buttresses at Notre Dame are of enormous projection, sloping very slightly on the upper side, and seen in perspective give an extremely ungainly outline to this otherwise noble work. At St. Remi, Reims, at a slightly earlier date, the same fault is seen, but it was at once felt to be a fault, and as we see, both in Reims Cathedral and at Amiens, was immediately corrected. At Notre Dame the error committed at Chartres, of making them enormously heavy, was carefully avoided. In many respects Notre Dame affords a singularly good subject for study. It shows us as completely as any one building the vast strides made during the century. The church generally dates from quite the commencement of the century; the west front from 1214, south transept from 1257, the alteration of the choir by the addition of chapels from 1294. In this period the style had become greatly changed. In the earliest work, as in the columns of the nave, we have a stately simplicity, which imparts singular grandeur to the interior. The capitals are very large, and admirably carved with foliage arranged in architectural forms, but largely composed of natural leafage conventionalised. All the work is admirably executed. If you compare it with Chartres, you will see how admirably. The aisles are still, after the manner of Auvergne, covered with stone pavement for roofs, and the whole work has the air of being strong enough to last for ever, without being clumsy. There is nothing frittered away or small, and the western towers, each with an array of shafts in the belfry stage of unusual splendour, are, so far as complete, the finest works of the age. The change in the transepts and the chapels round the apse is great. The architect is not one jot less clever: perhaps he is even more so. His work is beautiful, and beautifully executed. But the grand feeling for simplicity which had reigned supreme is no longer so evident. The mouldings have become too fine and delicate; the carving is too much a mere imitation of natural forms; and there is a sensible want of substance in the look of all the larger features, as, e.g., the windows of the transepts, which look too weak to stand.

The cathedral at Reims is the next in order of date of those which I can touch upon, and is altogether, for our purpose this evening, of very singular value. Its architect was Robert de Coucy, who began it A.D. 1211, after a fire had nearly destroyed the older cathedral, leaving only portions of the two transept fronts in such a state as to allow of their being kept in the new work. The new cathedral was consecrated in 1241, but works were in progress during the whole century under a succession of architects, who must have been singularly loyal to the original design. When De Coucy began his work he had before him the great abbey church of San Remi, still standing at the other end of the town very much in the same state as it was then. It is necessary to say something about this great church; for a comparison of it with the cathedral shows extremely well the process by which developments of design are ordinarily achieved. San Remi was consecrated in 1049, and in its original state was of the severest and simplest Romanesque. In plan it had a nave about 50ft. wide, of twelve bays in length, with a clerestory, and over the groined aisles an enormous triforium gallery for the use of worshippers. The nave, doubtless, had a wooden ceiling, and though the plan of the eastern portion had the same general arrangement as the Auvergne churches, with apsidal chapels to the transepts, the whole church seems to me to have rather more connexion with German buildings than with French. Its two western steeples illustrate this, being, in fact, lofty turrets on each side of the west front. Reims still retains a grand fragment of a Roman gateway. This has three arches, and between them three-quarter engaged columns, fluted. The San Remi builders evidently initiated this work; they regarded the columns as buttresses, and placed similar buttresses to mark the bays of their church, and at the west end they fluted them. At St. Jacques, Reims, they repeated the same feature, and it is a very interesting example of the way in which Roman buildings on the spot led to Mediæval adaptation of their features. In 1182 the east end of San Remi was taken down, rebuilt, and completed in 1198, on a plan which is nearly identical with that of a church at Chalons-sur-Marne, which was finished fifteen years earlier. An extended choir was built, with five eastern chapels, and outer aisles to the west of them as far as the transepts. The great triforium galleries of the nave were repeated, and lighted with large windows, so as to produce a very fine internal effect. Above the triforium is a simple arcade, which answers to the ordinary Gothic triforium, and above this a clerestory. There are thus four divisions in height, instead of the usual three, though this additional stage is a common feature in this part of France, as we see still at Laon and Soissons, and, as I have told you, exists at Notre Dame, Paris. By far the most beautiful feature in the building is the plan of the eastern extension, and particularly the way in which the difficulty of the aisle-groining bays in the apse has been surmounted by opening the chapels to the aisle with three arches of unequal width resting on detached shafts. This plan enabled the architect to make the vaulting of the aisle

very regular in its arrangement,—a square compartment and two triangular ones to each bay, the vaulting of the chapels being octagonal, though the sides of the octagon are not all equal. The columns of the choir are all plain cylinders, with square capitals, very finely carved in a bold development from the lines of a Corinthian capital. The arches are all pointed. The choir, in spite of its vast width, is groined, as, too, are the triforium galleries. The exterior has been a good deal tampered with. But it is doubtful whether it can ever have been a really beautiful work. The proportions are low and ungainly, and the great width of the old church was a stumbling-block to the builder of the new choir. He got over the difficulties ingeniously, and in some respects, especially in the plan, certainly shows the hand of an accomplished architect.

Robert de Coucy, when he began the cathedral, had this building to study. It had been only finished thirteen years; and it is extremely interesting to see how much it affected him, and yet how immensely he improved upon it. Evidently he fully realised the beauty of the ground-plan, for his is almost an exact repetition of all its general lines,—the same number of bays in the choir and apse, the same number of chapels, and the same outer aisles between the chevet and the transepts. But he dismissed at once the triforium galleries, and then gave up the fourfold division in height, and increased immensely the proportions both of the main arcade and of the clerestory; though, unfortunately as I think, he repeated the upper triforium arcade of San Remi without much alteration. The only great departure from the original ground-plan was in the arches to the chapels, in which he gave up altogether the beautiful San Remi arrangement. He could not well help himself. His dimensions in width were the same, those of height more than twice those of San Remi (124ft. as compared with 53ft.), and the three arches, which are well proportioned in the one case, would have looked absurdly narrow and ill-proportioned in the other. On the exterior his scheme was entirely his own. The buttresses are admirably designed, and, in spite of the magnificent scale of the building, do not seem, as they sometimes do, to overwhelm the whole building. In short, though it is clear, if his work is attentively looked at, that he had carefully studied San Remi, it is equally clear that the alterations which he made in the proportions, in the external elevations, and in the details, were so great that few would ever be likely to discover the underlying evidence of similarity. It is this which seems to me to be so worthy of your notice. The great and accomplished architect of the cathedral had none of the conceit which prevented his seeing the good in what had been done before; but rather, with admirable skill, seized on the really fine points of the work before him, and showed how much more splendid the scheme might be made. This is the true spirit for an architect. It is the spirit in which you must work if you want to be regarded in the way in which we all think of Robert de Coucy and his work. This is the real lesson which a study of Reims Cathedral teaches. To tell you in detail anything about the cathedral would take much time. Its great virtue is its admirable simplicity throughout, save at the west end, where by the end of the century another architect showed in all its glory the latest development of the thirteenth century. Three enormous portals covered in every portion with sculpture, above them a splendid rose-window, and on either side two steeples of rare beauty of design,—these have an interest of the same kind as the rest of the church. The neighbouring cathedral of Laon is still famous for the six steeples of its three fronts, and the exquisite treatment of their angles, which have open arrangements of arcades and shafts, square in some and circular in others. Reims was to have had six steeples also; those to the transepts were begun before De Coucy's design was made, and were evidently to be of the same type as those at Laon. But at the end of the century the architect had come to dislike the Laon system, in which the open pinnacles were built up by a succession of columns and arches, piled one on another. He thought long continuous lines of moulding more effective, and though he retained the idea of open pinnacles, he constructed their piers entirely of clusters of mouldings corresponding with those of his belfry windows. I think the architect of Laon has the best of it in the result. But it is impossible not to see the influence he exercised, any more than it is not to admire the beautiful design of the Reims steeples. As in most great French churches the mouldings are few and simple. There are two features to which I take exception; these are the absence of a sufficient base moulding, and the overwhelming size of the great niches which crown the buttresses of the aisles, and almost conceal the clerestory from the exterior. The solidity of the whole church is much in excess of that of many later buildings; but its justification is its perfect condition structurally, and I may almost say the absence of a crack or settlement throughout its vast extent. I wish to see no finer sight than such an interior, as I saw it only yesterday hung all round with precious tapesteries of the fifteenth century, which set off and adorned its superb and dignified architecture in the very best way.

Fine as are such churches as Chartres, Notre Dame, Paris, and the Cathedral at Reims, I suppose that Amiens Cathedral is by common consent the greatest achievement of the century. It is difficult to say precisely why; for, not to mention others, the slightly earlier cathedral which I have just been speaking of, at Reims, is even more complete and more exactly what its first architect intended it to be. And for perfect beauty of plans and poetical inspiration of design I think Rouen goes near to excelling all. Probably the dimensions and the beautiful proportions of Amiens give it the position it has. Its columns are about 49ft. from centre to centre across the nave, and its total height is above 140ft., as against corresponding dimensions at Reims of 54ft. and 124ft. The points of support, and its glazed triforium, add to the airy lightness of effect which distinguishes it. Its proportions appear to have been regulated by the equilateral triangle. The church was for some time in progress, and the design was much modified during the erection, notably in the triforium and clerestory. What strikes one most here is the supreme constructive skill of the architect. No part of the building appears to be unduly heavy or unduly weighted. All the details are well designed and admirably fitted together. The glazed triforium, which is perhaps first seen here in a large church, is very conspicuous for its beauty and lightness, whilst the flying buttresses and pinnacles are beautiful in their outline, and contrast admirably with the heaviness of those at Chartres, the ungainliness of those at Paris, and the apparently overwhelming size and number of those at Le Mans and Köln. The vaulting at Amiens is unlike the common French mode. In order to get as much light and shade as possible, the horizontal section is everywhere very square, and to secure this, the diagonal vaulting-ribs are not semicircles, as is commonly the case in France at this time, but compound curves generated from the transverse arches, and giving a true horizontal line for all the ridges. The lines of such vaults near the eye always, I think, look crippled; but here, at the enormous height they are above the floor, it is very difficult to follow the lines of these curves, and, therefore, there is no sense of their not being exactly true curves, whilst the best possible effect of light and shade is secured. The effect of the original scheme of the nave has been much spoilt by the addition of chapels between the buttresses of the aisles. The effect of these is to remove the windows so far back between solid walls that in the internal perspective they are not at all seen, and so the lantern-like effect which was everywhere the aim of the architect has been lost. At Amiens, as at Chartres, Paris, and Reims, sculpture has its share in the success of the work. The three great western doorways are covered with it; and many of the small subjects illustrating the labours of the Months and the signs of the Zodiac, as well as subjects from the Bible, are full of interest, though not executed by quite so good a sculptor as that of the porches at Chartres and the doorways at Paris. Here, too, let me say that the whole of the masonry of this great church is finished with a claw tool, which gives it from the first a texture far superior to the smooth surface which we all affect so much now. I mention it to you in order to direct your attention to what may seem, but is not really, a very minor point. At the time Amiens was nearing completion, the effect produced by its magnificent scale and beautiful proportions was remarkable. At Beauvais, not much more than thirty miles distant, the bishop and people were so jealous that they resolved to erect a church whose glories should completely eclipse those of their rival. Their architect lent himself to the scheme with as much zest as any of us would now. His dimensions were considerably in excess of those of Robert de Luzarches at Amiens, but his ambitious schemes were too great for safety, and had to be, to a great extent, altered after a portion had given way, so that the building, as it now stands, does not fairly represent the impossible lightness of the first scheme. In addition to an imitator at Beauvais, Amiens undoubtedly gave all his lines and plans to the German architect of Köln Cathedral, as it did to men so far off as the architects of Clermont-Ferrand and Narbonne—perhaps, too, of Leon, in Spain. The later variations of the type are certainly no improvement on the original. We see the art gradually losing its freshness and force, and becoming, perhaps more scientific, but certainly more scholastic, and consequently far less artistic and interesting. The change can nowhere be seen better than at Köln, where, though the architect took his general scheme and his proportions from Amiens, he gave all his details so essentially hard and violent German a character as to destroy to a great extent the evidence of the parentage, without, I think, improving the effect.

I must now sum up in a few words the general characteristics of the thirteenth-century architecture of France. It was, then, a style which was always in the most rapid state of transition and development. The century begins with vast, noble, and solid erections, heavy in construction, very similar in general plan and design, and ends with works in which, though the construction was still solid, it was so scientific, so delicate in its adaptation to its requirements in every part, that it had become light and airy almost past belief. In these respects it has never been excelled before or since. In complete work of this period there is always a strict relation in every part of the plan to the work to be done. The thing to be supported dictated absolutely the shape of the support, and the nature of the material decided the character of the design. The details had all been developed and improved; the windows, from being plain and rude lancets, had become richly-moulded and splendidly-designed compositions of geometrical traceries, all arranged with careful adaptation to the proper subordination of parts, the mouldings and traceries following each other in their relations to the primary, secondary, and tertiary importance of the parts. The buttresses had come to be treated as the real framework of the building. To them all weights were conveyed, and by them on to the ground. The panels enclosed between them showed no waste of wall. They were reduced to mere screens to keep out the weather, which was indeed their main if not their sole office. The proportions of height to width were much greater and much better adjusted, and the study of perspective effect, both inside and outside, was carried to the greatest perfection. The same attention to what one may fairly term a brilliant beauty of detail was exhibited in every part of the work. In sculpture, the study of nature and of life had taken the place of a steady respect for ancient and conventional representations. Foliage came to be copied directly from nature, but with an instinctive sense of the necessity of adapting it to structural purposes which is very remarkable. In a capital, for instance, though the detail was natural, the arrangement of the natural forms was strictly architectural. In a spandrel, where it was simply meant for ornament, an absolute imitation of nature is allowable, and was freely indulged in. A string-course, as we see at Amiens, was made like a garland of gay flowers carried all round a building. In the representation of the human figure a still greater progress was made. Compare the west doors of Chartres with the southern doors, and the change is made very clear. The latter sculptors evidently studied from the life. They represent men in fashion of the day, and in their faces, their attitudes, and their grouping, there is a gay and tender sentiment which seem to me to be absolutely enchanting. You are impressed, whether you will or no, with a sense of an age unlike our own, with no misery, no misfortune, nothing to mar the charm of the pleasantest and purest life: and though, of course, some men's work is infinitely in advance of others, a general high level is reached and

sustained in a striking manner. Everywhere the work of the sculptor is called in to adorn the work of the architect, and so harmoniously is this done that no one can tell where the office of either began or ended. Then in all the subsidiary arts the same excellence is seen,—whether it is in the decoration of a manuscript, the painting of glass, the execution of elaborate work in all the metals, in enamelling, in embroidery, — everything was done with careful reference to the requirements of the material and the use to which the article to be manufactured had to be put. And though I am loyal to the art of my own country, I am obliged to admit that of France to be entitled to a sort of supremacy. In the previous century she had given an architect and a design to Canterbury and to Compostella; in this, she covered her own soil, stirred up the Germans to an imitation of her work at Köln, designed the great cathedrals of Toledo and Leon in Spain, and had a conspicuous influence in Italy at Genoa, Vercelli, and Assisis. In the brief space of a century the French architects had almost shown the limits of what was possible in the way of development, and left comparatively little, and that matter of detail rather than of principle, to their successors to achieve. They had a grand opportunity, and certainly availed themselves of it in the grandest way. The people seconded their efforts with a supply of means for building so large and extraordinary as to be well nigh incomprehensible. The drawbacks on their work are, generally, a want of completeness on the exterior, which has at the same time the attractiveness of the unexpected. If you build a church on the scale of Amiens it is impossible to add steeples to it which shall not either dwarf their mother church or themselves be dwarfed. A central steeple is impossible; and the examples of such a feature are very rare anywhere in France at this time, and then, generally, as at Coutances, they are an evidence of English influence. A multitude of steeples, two at each front, with a lantern occasionally in the centre, making it six or eight to one church, render it impossible to secure such effective grouping as we see in our English churches. And the enormous height certainly goes far to diminish the apparent length.

It is fortunate for you students that you are within such easy reach of those great masterpieces of art as are the monuments of French art. The young architect may, indeed, well be advised to study first of all the art of his own country, to which that of Normandy may be considered simply as supplementary, so closely allied is it to English art. But to the sculptor students I appeal with all my strength not to neglect this vast field for study. Far be it from me ever to advise any one merely to copy what has been done before; but not to avail yourselves of it in your studies is blindly to refuse to make use of one of the many paths which lead to real knowledge and mastery of your art. Remember what Flaxman told you about Wells, and believe me that if, as he said, you may learn much there, it is as nothing to what you may learn in France, where the examples are manifold more numerous, of all dates, and of even greater value.

This evening I have tried to give you some faint idea of the way in which the thirteenth-century architects regarded and treated their art. This seems to me to be at least as valuable a subject for your study as are mere questions of detail; for I want to see you all working in the same spirit as those great men, and not merely trying to reproduce exactly what they have already done so well.

"BUILDING NEWS" DESIGNING CLUB.

REVIEW OF DESIGNS FOR CRICKET PAVILION.

MANY ingenious plans and cleverly-drawn sketches have been sent to us for review, though several of the competitors have lost sight of the purpose and characteristics of a building of this class. (1) "Jack" we place first, as he has furnished a sensibly-treated elevation with verandah and look-out over. An assembly-room 30ft. by 20ft., with bay window at one corner opening into a verandah, forms one end of the block. There is a wide entrance with dressing-room and a bar 20ft. by 15ft. 6in. on the other side, with lavatory and conveniences in the rear. A staircase in the centre of block leads to the open balcony or look-out and ladies' room, and there is another staircase from kitchen to bar. The verandah is certainly too small for a number of visitors, and the assembly-hall larger than need be. The sketch is artistically shaded, and the elevation is conceived in a half-timbered and characteristic style. (2) "Cui Bono" is clever; the verandah and open balcony afford ample room for visitors, and the half-timbered upper story is well treated. On the ground-floor is a club-room with dressing-rooms in the rear placed as a wing at right angles to the refreshment-bar and kitchen; a central staircase is shown leading to ladies' cloak-room, smoking-room, and balcony; but the kitchen is shut-off from the main staircase, and has a separate stair communication with the refreshment-bar below. This arrangement is better than making only one stairs available, as many have done. The club-room and entrance-hall are small and rather awkwardly managed. (3) "Ephraim" is treated with much freedom and expressiveness. The verandah and large flat over the bar are good features, and the tower over staircase forms a picturesque object. The bar is, however, wasteful in area, and the assembly-room not approached as it might have been from the verandah. The lead flat is approached by a staircase, and the ladies' retiring-room is also in communication with it. (4) "Beta." This is a freely-treated half-timbered and brick building, with a rather fantastic corner balcony and verandah below. The assembly-hall, 30ft. by 20ft., has too much the appearance of a schoolroom, and the movable platform suggests the master's desk. The entrance and the refreshment-bar are not convenient in their position or connection. Upstairs is a ladies' retiring-room, with oriel window and balcony, and the kitchen, scullery, and pantry are provided on this floor. The staircase and general treatment of open pavilion over it are pleasing. (5) "Veronese" sends a cleverly grouped and effective sketch, showing a brick structure half-timbered in gables and a verandah, the chief feature being a bold projecting octagon end to the refreshment-room, and a turret-staircase to ladies' room, balcony, and kitchen above. There is nothing in the sketch suggestive of the purpose; the building looks too solid and permanent for a cricket pavilion. The planning consists of a large hall, 25ft. by 16ft., the main entrance to which is under the verandah. It opens at one end into a refreshment-room, lighted by a projecting bay, and it communicates also with the dressing-rooms, &c., in the rear. The kitchens, ladies' retiring and gentlemen's smoking-rooms, are on the first floor. (6), "Fidelis" is a design which approaches in character to the requirement. The assembly-room forms a prominent and central feature; on one side the refreshment-bar is placed, and on the other a gentleman's dressing-room, with lockers, and a staircase to first floor. At the back are arranged stores, lavatory, &c. The ladies' retiring room and kitchen are above the assembly-room. The conveniences are rather clumsily managed, and the elevation, suitable in style, is rather too high-pitched. There is no balcony, but a verandah along the front. (7) "Eclipse" makes a large assembly-room, 30ft. by 22ft. with a bayed window end, entered from verandah. The refreshment and dressing-rooms, planned as a cross-wing, are tolerably convenient and well-fitted with lockers, lavatory, basins, &c., and above this cross-range are the ladies' room, kitchen, &c., but no balcony. We do not think the elevation equal to the plan; the projecting refreshment block is chopped up, and the junction of octagon-ended hall with main building awkwardly managed. The ladies' w.c. is obtrusive, and badly ventilated and lighted. The drawings are neat. (8) "Pupil J" covers too large an area; an assembly-room 40ft. by 26ft. is shown. The dressing-room and lavatory are unnecessarily spacious, and the entrance and bar inconvenient in relation to each other. There is a wide verandah with a balcony, in connection with ladies' room, but the arrangement lacks skill, and the elevation is heavy and clumsily grouped. (9) "Nitor." There is something characteristic in this design as regards external treatment. A verandah, with balcony over, is carried round two sides, and a scoring-box, carried up as a corner turret, forms a pleasing feature. There is an assembly-room, 18ft. by 16ft., a refreshment-room, and dressing-room below, with ladies' room, kitchen, and conveniences above; these are approached by an outer flight of steps at one end. The building is compact, though scarcely worked out satisfactorily in detail. (10) "Bonus Hominus" is ingenious in idea; a verandah extends along the whole front, and the assembly-room forms one end of the block and the refreshment-bar the other; a centre stairs from lobby leads to the ladies' retiring-room, and another external stair connects the bar with the kitchen. The upper plan of the rooms partakes of an octagon, with windows in each face, roofed by a steep-tiled roof. The entrance lobby is contracted, and the external offices are awkwardly arranged. The ladies' retiring-room appears useless unless in connection with a balcony, and the kitchen windows command the best views. (11) "That's My Idea" is a little too fanciful; the timbering is overdone; but the plan has a good general distribution, though the balcony and ladies' room are very cramped. (12) "Ambition" has also a notion. The assembly-hall is placed between two projecting wings with verandah between, but the proportions are not good. The elevation is rather feebly drawn, though suitable in style; no indication of a balcony is shown. "Merit" has a similar arrangement, though capable of improvement, the wings containing dressing-room, ladies' room, kitchen, and offices, but the elevation is more suitable for a villa as it is. "Alpha" has also made the assembly-room the centre feature, with refreshment-bar behind and dressing-rooms on each side, but the roofing looks lumpy, and the details and staircases are awkwardly managed. "T. A. H., in circle," adopts a like arrangement to the last; the ladies' retiring-room and kitchen, approached by a side-stairs, are too large; the elevation is suitable, and the balcony and verandah are good points. Less satisfactory are the designs of "Cambria" "Squib," "Lancaster," "En Avant," though they are not without merit. "Endymion" is a well-conceived elevation; the verandah is emphasised and made to flank the assembly-room; the least satisfactory part of plan are the bar and dressing-rooms. There is a balcony and stairs at one end. "Per" is novel at least; the assembly-room and bar is carried up with a steep hollow roof with wings at a lower level. There is a balcony over entrance, a retiring-room for ladies, and a gallery for visitors, with seats; the planning is, however, crude and unsatisfactory. We can only generally allude to "Fred," "Trial," "Nil Desperandum No. 2," "Ernest," "Hexagon in circle," and "Always Bottom, né Belteshazzar." This time, at all events, the result scarcely justifies his change of motto. The others are too fanciful, and there is little to suggest a cricket pavilion, in spite of the exercise of much ingenuity.

AN OAK BEDSTEAD.

For the oak bedstead we have received a number of sketches, but these are not up to the mark. "Nemo" is the best drawn, but the design is lost in hangings, and the elevations only show heavy bottom posts filling in at the foot, and a heavy cornice with deep fringe. The details are coarse. "Cui Bono" is more original. It shows a Japanese treatment of the head, or tester, of open trellis-work, scarcely suitable. The small bracket is useful. Pitch-pine with gold panels is proposed, with curtains of grey-green ground with white pattern. "En Avant," "Quid," "Squib," "G. W. W.," "Con in circle," and "Rex," are the mottoes of the other designs. These all indicate crudity in the detail, and the treatment and ornamentation are not suitable. The first is the best.

It is proposed to add a chancel to St. Andrew's Church, Waterloo-street, Hove, at a probable cost of about £2,500. Mr. Charles Barry, whose father was the architect of the church, has prepared the plans, and Messrs. Lynn and Sons, builders, of Brighton, have been requested to send in rough estimates of cost.

At a meeting held at Chard last week, it was resolved to take steps for restoring the fine Perpendicular Church of St. Mary the Virgin. The proposed works include the removal of the galleries, box-pews, and pulpit, erected in 1820, the re-seating of the building, the raising of the roof to its original pitch, and the raising of the tower; and they are estimated to cost £4,200.

The town council of Chester last week adopted plans by Mr. Lynn, architect, for increasing the accommodation in the public market.

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ILLUSTRATIONS.

R.I.B.A. SOANE MEDALLION DESIGN FOR A COUNTY COURT —THE GRANGE, LITTLE TEW.—DESIGN FOR VILLAGE INN AND SHOPS.—PROPOSED BUILDINGS IN NORTHUMBERLAND AVENUE.—THE PRIORY CHURCH OF ST. MARY, BLYTH, NOTTINGHAMSHIRE.

OUR LITHOGRAPHIC ILLUSTRATIONS.

SOANE MEDALLION PRIZE DRAWINGS.

The Soane Medallion has this year been awarded by the Institute to Mr. Roger T. Conder, of 2, Wyndham-crescent, Junction-road, N., for the design, as illustrated, for a county-court for a provincial town of 30,000 inhabitants. In the preparation of this design special attention has been given to the directions to competitors to "aim at dignity and breadth of design rather than at merely picturesque effect." The external treatment of the design is a severe Renaissance brick and stone building, having a plain and solid stone ground-story; the upper part of the design, except cornices, strings and piers and lintels of windows, being in red brick. The plans have been adopted after a careful study of existing county-courts, and an attempt has been made to provide the necessary accommodation in as compact and convenient a form as possible. The plan of the ground-story consists of two entrances, one for the public and the other for the judge; two staircases, semicircular on plan, rising above the roof into conical turrets; the registrar's public and private offices, a safe room, waiting room, bailiff's public and private rooms, and a robing-room; the last four rooms opening out of a wide corridor which runs through the building from staircase to staircase. The height of this story is 15ft. The public staircase is carried down to the basement, in which is placed the heating apparatus, fuel, &c. The first-floor contains the two staircases—a corridor connecting the staircases and giving access to the witnesses' rooms, the public vestibule to court, the court itself, which measures 40ft. by 30ft. 6in., and is lighted by windows in the front wall of the building; the registrar's court; rooms for witnesses, with lavatories, &c., attached; a room for the use of juries and other purposes; and the judge's retiring room, with lavatory, &c., attached. The height of the court-room is 22ft., and of the corridor and rooms adjoining, 15ft. The court-room has a flat ceiling of moulded beams, supported by cupids. A gallery is provided for the public, in addition to seats on the floor of the court. The caretaker's rooms have been placed on the third floor, and are accessible by both the staircases. The lantern placed on the main roof is intended to act as a ventilator for the court-room.

THE GRANGE, LITTLE TEW, OXON.

This building was originally a vicarage house designed by Mr. G. E. Street, R.A., and subsequently enlarged by the late Mr. C. Buckeridge. It has since been purchased by the Rev. C. F. Garratt, and another house has become the vicarage. This house, now "The Grange," has been enlarged, as shown in our illustration, by the addition of the parts tinted black in the plan; Mr. Edward G. Bruton, F.R.I.B.A., diocesan surveyor for Oxon, being the architect.

"BUILDING NEWS" DESIGNING CLUB—A VILLAGE INN, AND SHOPS.

Two village shops and a country inn at the corner, form the subject of our "Building News" Designing Club to-day, and "Veronese" is the author of the selected design which we have published. His plan is not good, as we have already said, when reviewing the whole of the designs; but his elevations have much to recommend them, and, any way, his was the most suitable design for the first place of those contributed. More care in the drawing of his design would have been an advantage.

NORTHUMBERLAND MANSIONS, CHARING-CROSS.

Our illustration shows a block of residential chambers proposed to be erected at the corner of Northumberland-avenue. It is intended to construct the floors of fireproof materials, Portland stone front with granite dressings. The interior will be specially arranged for residences, with hydraulic lift in centre of building. Numerous applications have already been made to take various portions of the premises. The designs, which have been approved by the R.I.B.A. and the Metropolitan Board of Works, are by Messrs. Ingram and Hollands, of Gresham-street, E.C.

THE PRIORY CHURCH OF ST. MARY, BLYTH, NOTTINGHAMSHIRE.

Mr. C. C. Hodges, of Hexham, is publishing a most interesting monograph of the fine Benedictine Priory Church of the Blessed Virgin Mary at Blyth, and we can recommend the book to all who value thoroughly reliable drawings of our old English churches. The nave of Blyth church (which was 158ft. long) is among the earliest examples of Norman work in England, while a splendid example of Late Fourteenth architecture is found in the western tower. The nave was vaulted in 1230 with the plain quadripartite vault, as seen in our interior view, which we have reproduced with the exterior view and plan from the original drawings which Mr. Hodges has lent us. The ribs of the vaulting are richly moulded, and have boldly-carved bosses at the intersections of the diagonal ribs. The Norman vaulting shafts are incorporated in this vault, and a moulding carried round them, above which the vaulting ribs spring. On the inner face of the nave walls, above the vault, are still to be seen the mural decorations of the Norman period, in the form of dark red lines about ¾in. wide, dividing the surface into parallelograms averaging 21in. long and 8in. high, thus representing ashlar work on a ground of dull yellow in distemper. In order to form a parish-church, the south aisle wall of the nave was taken down in 1287, and the aisle extended laterally as far as the south wall of the south transept, and so was settled the endless disputes between the vicar of the parish and the prior of the convent. This enlargement of the church was admirably carried out, and when the building was complete the internal effect must have been very grand indeed. Now the choir is gone, as will be seen by the plan; for the ruins of this part of the church were swept away by Edward Mellish in 1684, when he rebuilt Blyth Hall. The eastern bay of the nave and the north aisle are now walled off from the rest of the church, and are used by the proprietors of Blyth Hall at their pleasure, in connection with their garden, for an aviary and other purposes. The next bay westward is used as a vestry, and the next two bays are occupied by the Blyth Hall gallery and the staircase to it. The domestic buildings of the priory have been entirely destroyed by the erection of Blyth Hall, the only remnant being a small crypt with a plain barrel vault. The rood-screens of the conventual and parish churches are in a line; the former is the earlier of the two as it has also been the richer, but it is now only in a mutilated condition. Its lower panels remain on the south side forming the front to the pews, and a portion of the upper tracery on the north side is incorporated in the Blyth Hall gallery. The 16th-century parish rood-screen has been restored, and has six painted panels in good preservation. Originally the choir terminated with an apse 60ft. east of A on plan. B is the S.W. angle of the south transept. Mr. Hodges gives several other detailed particulars, and he has carefully shown in his sections, elevations, and details, the various peculiar characteristics of this once most noble but now sadly desecrated building. His plates are all lithographed by himself, and are 20in. by 14in. in size, the details being to inch scale, and the general drawings to 3-16th of an inch to the foot. Only 50 copies have been struck off, and these have been privately printed.

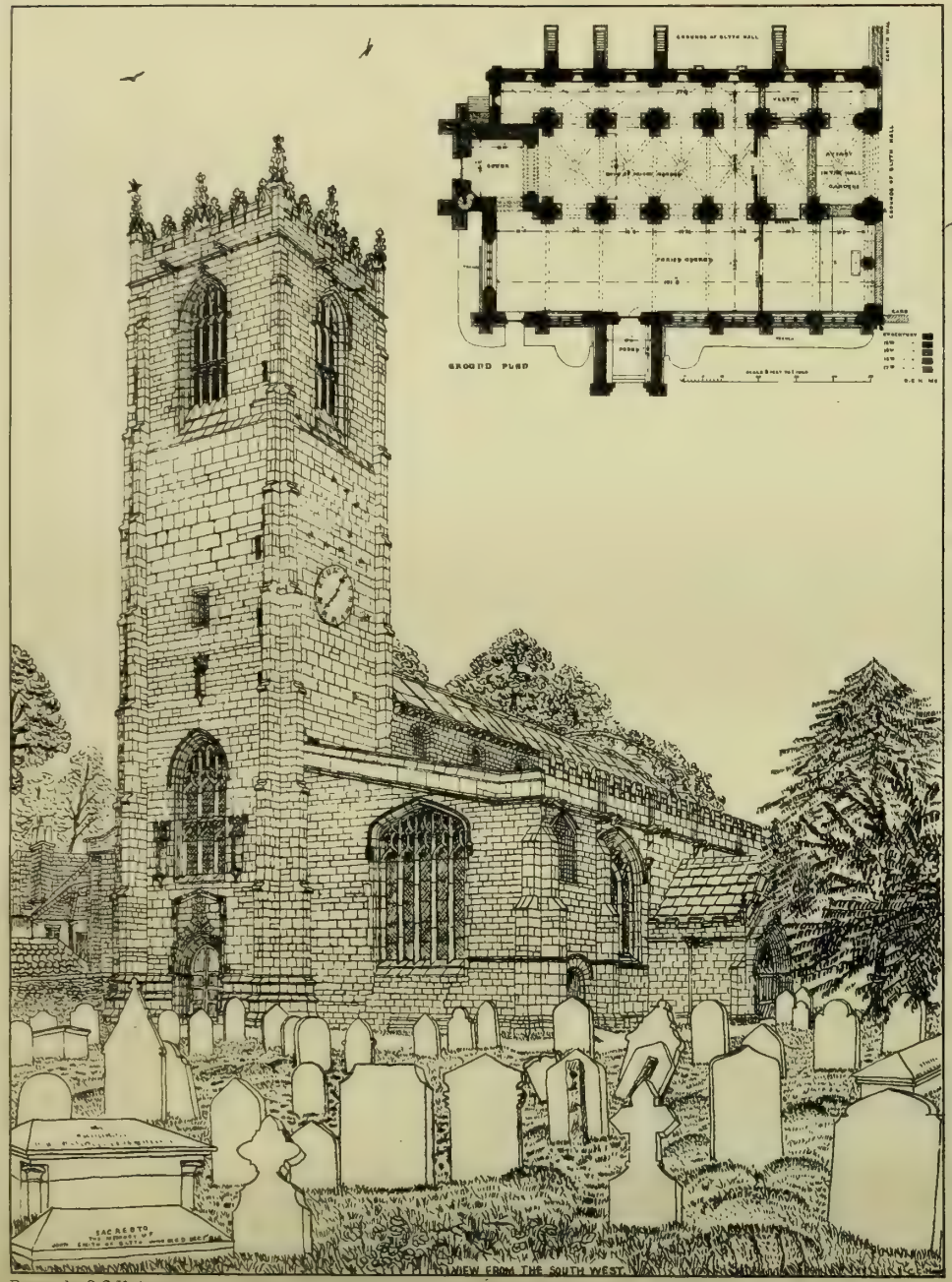
THE GLASGOW MUNICIPAL BUILDINGS.

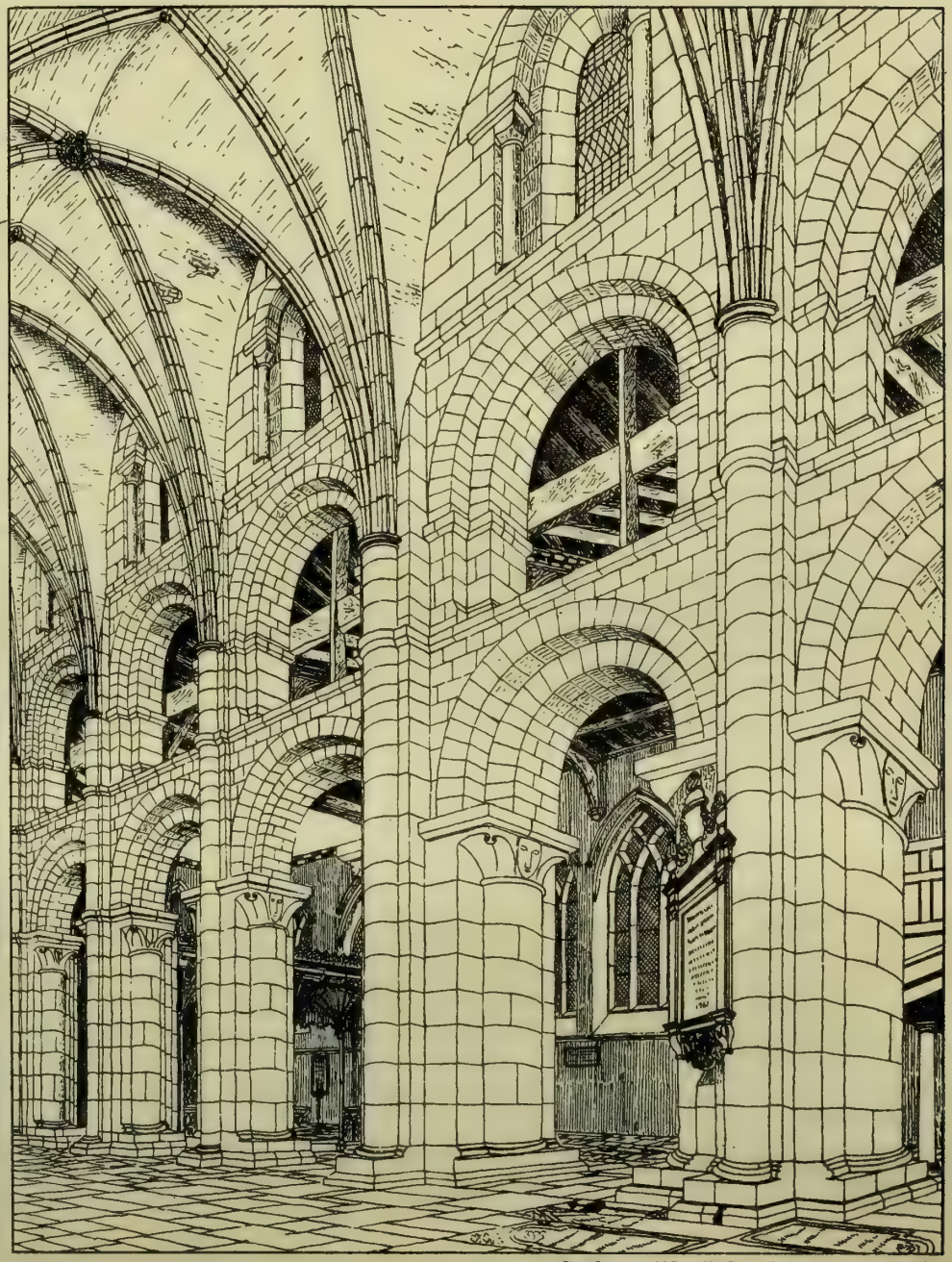
The members of the Glasgow Town-council are travelling, in the new municipal buildings scheme, in the slow and uncertain fashion which has marked their movements in the past. At a meeting held on the 14th inst., the committee in charge of this important undertaking recommended that Mr. Carrick, the city architect, should be instructed to prepare new sketch plans, showing accommodation for an art-gallery. This proposal to combine a picture-gallery with the municipal buildings gave rise to an animated discussion. Those who favoured the recommendation of the committee said that it was not intended to provide an art-gallery, properly so called; but only in the plentitude of space to associate with the corporation rooms a kind of superfluous gallery, if the city architect should see his way to furnish such a superfluity, in which works of art might be displayed. It was admitted that municipal requirements must first of all be fully satisfied; that even the most ardent supporters of the committee's recommendation were not sure that Mr. Carrick would find the art-gallery to be a feasible project; but there could be no harm, so they argued, in allowing that gentleman to exercise his ingenuity in the direction indicated. There were other members of the council, however, who were altogether opposed to what was proposed, even if it were possible (and in their opinion it was not possible) to provide a picture-gallery without dwarfing the apartments for municipal use—it was not desirable to do so. The future necessities of the case could not be met in any such partial and niggardly way; the taste for art, the Lord-Provost and his colleagues were reminded, had largely extended in Glasgow and the west of Scotland of late years, and they might naturally expect to receive donations of pictures in the coming years, the proper housing of which would imply the erection of galleries devoted to art alone, and worthy of the city. Having thus discussed the art-bearings of the question, one or two councillors called attention to the obvious fact that the town-council of Glasgow is frittering away a great deal of time in connection with this scheme, and they urged that in the present depressed state of the building trade matters should be expedited as much as possible in the interests of tradespeople as well as of the ratepayers. In the end, however, the recommendation of the committee was agreed to, and it may be said, with all due respect for the town-council of Glasgow, that that does not seem to be the way to expedite matters. The city architect's sketch-plans are almost certain to be unsatisfactory, for the reason that he is obliged to attempt too much, and the work will all require to be done over again with the so-called picture-gallery left out.

The foundation-stone of the new church of St. Chad was laid at Derby on Tuesday. The style is Early Lancet, and the church consists of a nave, 83ft. by 31ft. 6in.; aisles, 14ft. wide; chancel, 27½ft. long by 24ft. 6in. wide, having apsidal east end, and choir and clergy vestries. The walls will be faced with Little Eaton stone, and the woodwork will be of deal. Upon the east end of nave will be a bell-turret. Mr. Turner, of New Court Chambers, Chancery-lane, W.C., is the architect; Mr. G. Hewitt, London-road, Derby, the builder; and Mr. James Drummond the clerk of works. The heating apparatus is by Messrs. Haden and Sons, Trowbridge.

When St. Jude's church, Tothill-lane, Bristol, was built a few years ago, from the designs of Mr. James Hine, F.R.I.B.A., architect, of Plymouth, funds were so low that the execution of the carved work was left until another time. The decorative sculpture just completed has been carried out by artists belonging to the staff of Mr. Harry Hems, of Exeter, acting under the directions of Mr. Hine, the architect.

New schools and lecture-hall for the Presbyterian Church, at Longsight, Manchester, were opened this week. The architect is Mr. J. M. MacLaren, King William-street, Strand, London.

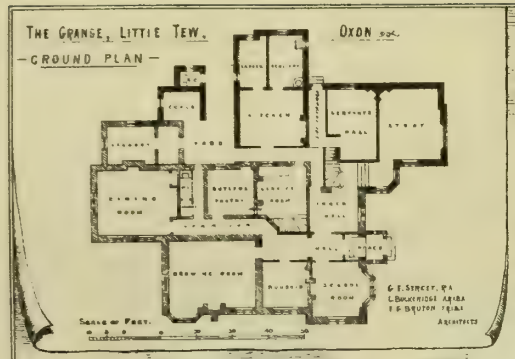




Drawn by C C Hodges.

Photo Lithographed & Printed by James Akerman, 6, Queen Square, W C

The Priory Church of S. Mary, Blyth, Nottinghamshire.



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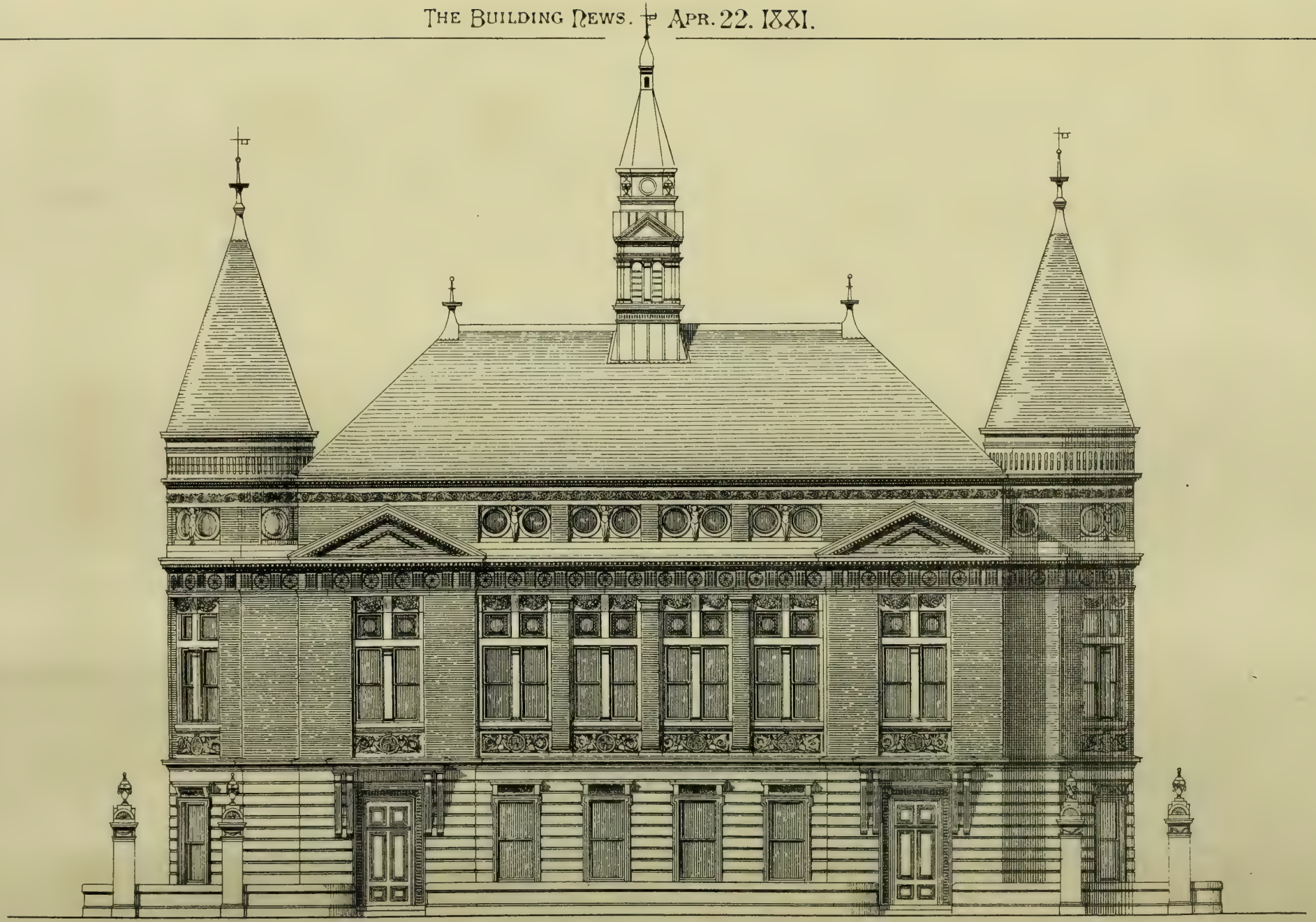
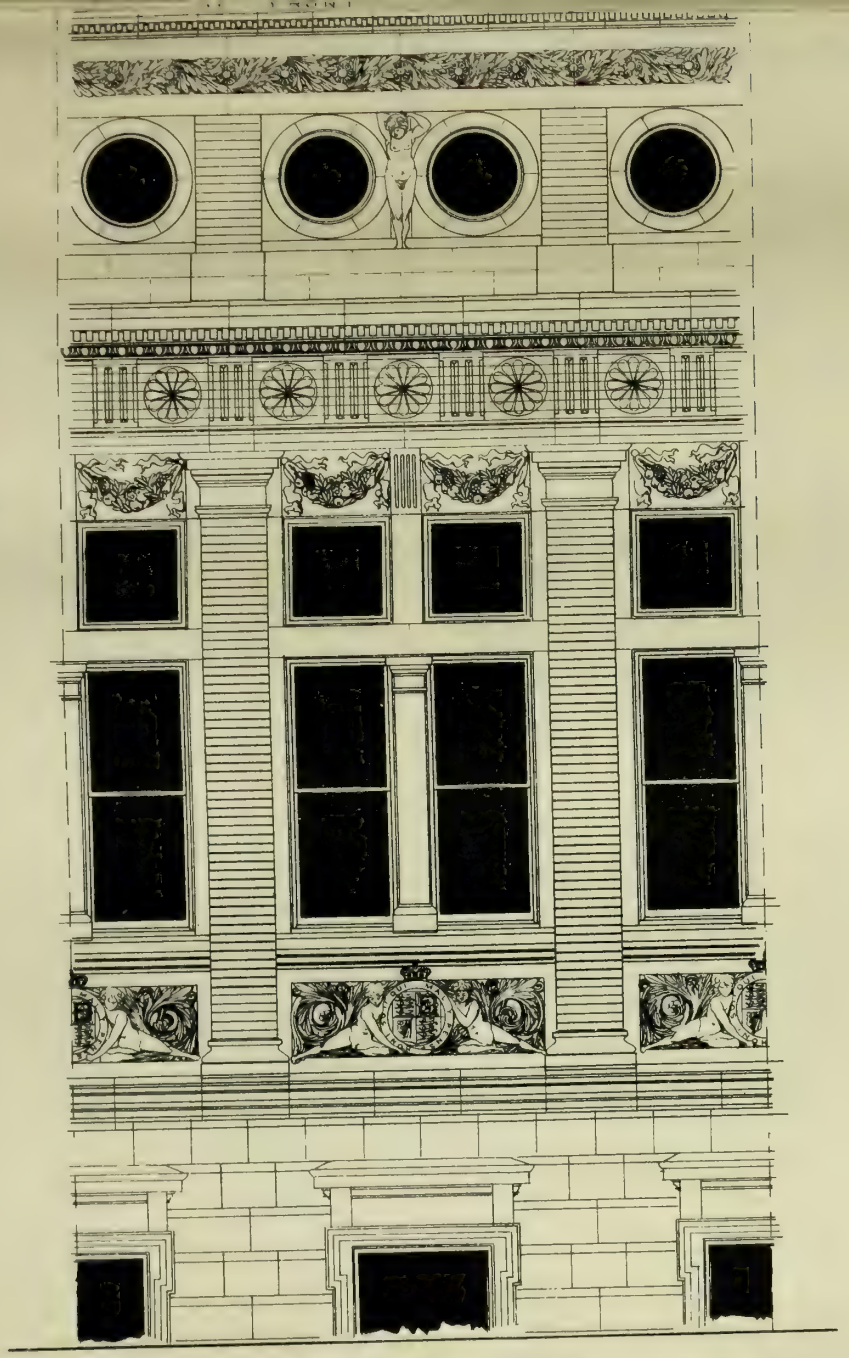
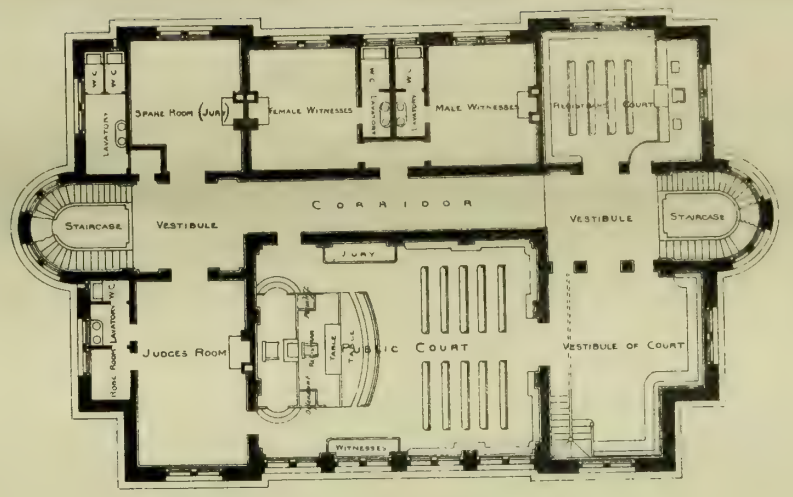
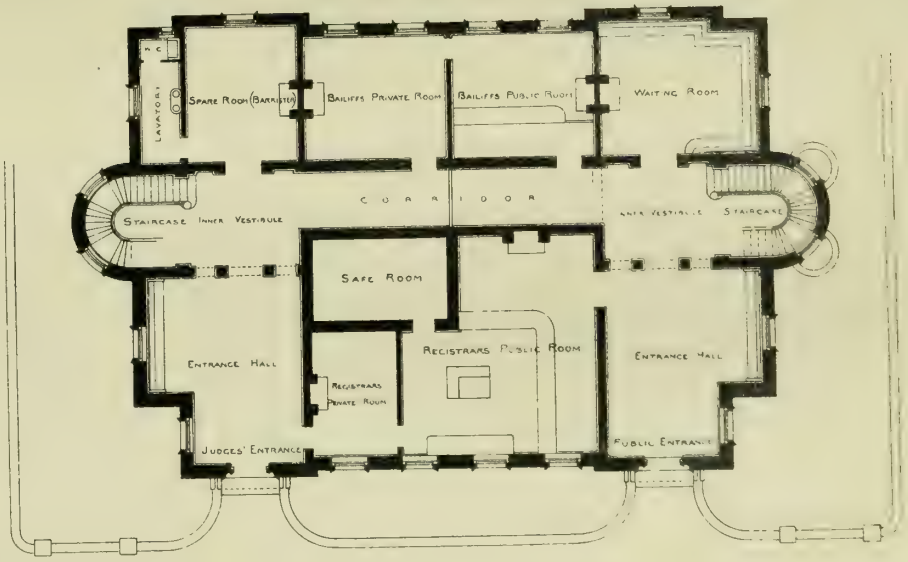


FRONT ELEVATION

Scale of 10 5 0 10 20 30 40 50 feet







Ground Floor Plan

THE PRIZE DESIGN BY
ROGER T. CONDER

Photo-Lithographed & Printed by James Akerman, 6, Queen Square W.C.

R.I.B.A. Soane Medallion Competition

Design for a Provincial County Court

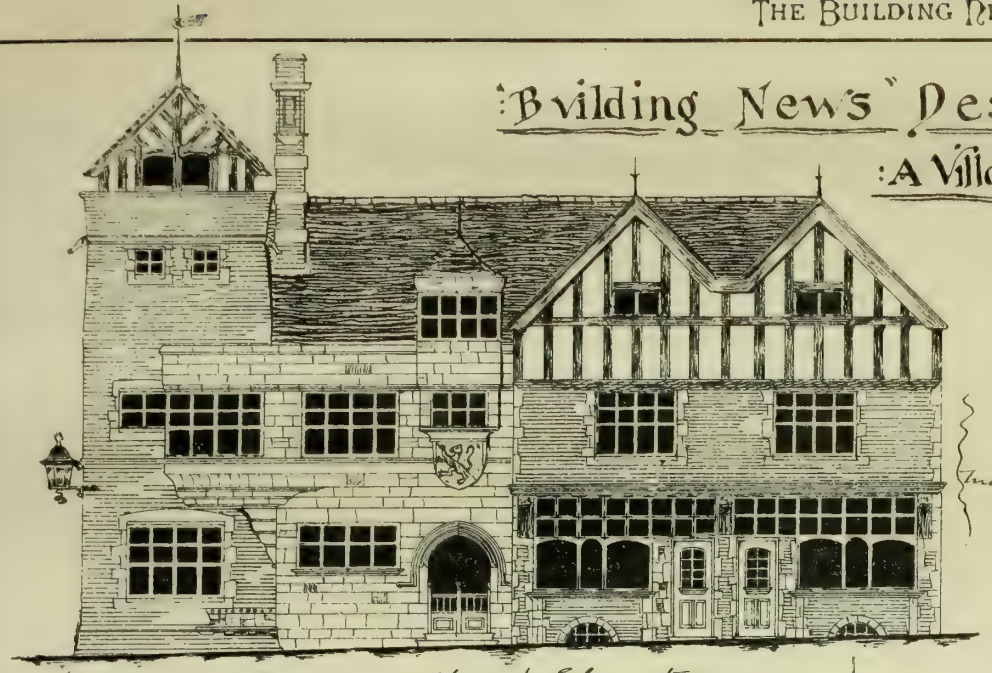
"Building News" Designing Club:

A Village Inn and Shops:

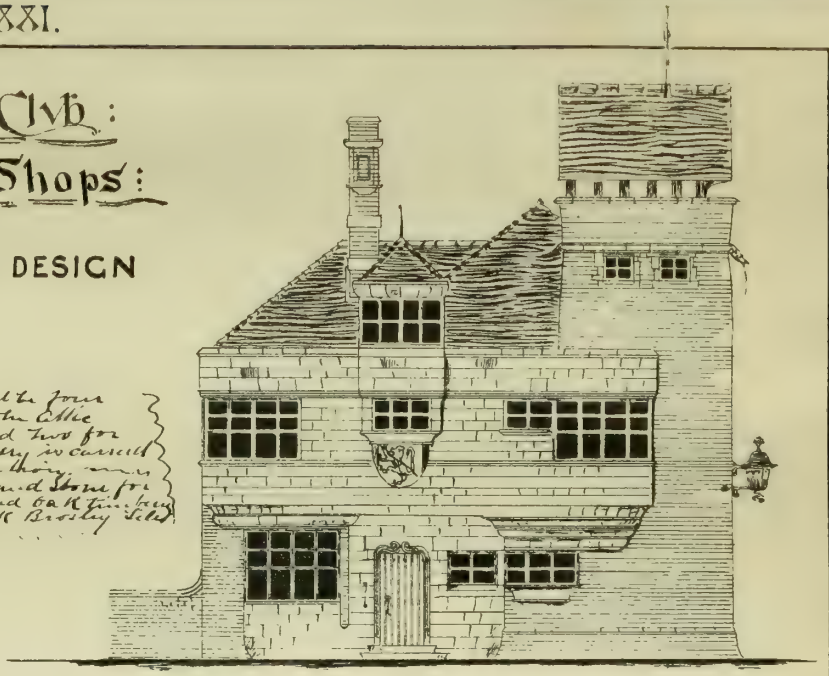
SELECTED DESIGN

Note. There will be four Bed Rooms on the Attic floor of Inn, and two for Shops, the smoothing is carried up on the Elevation.

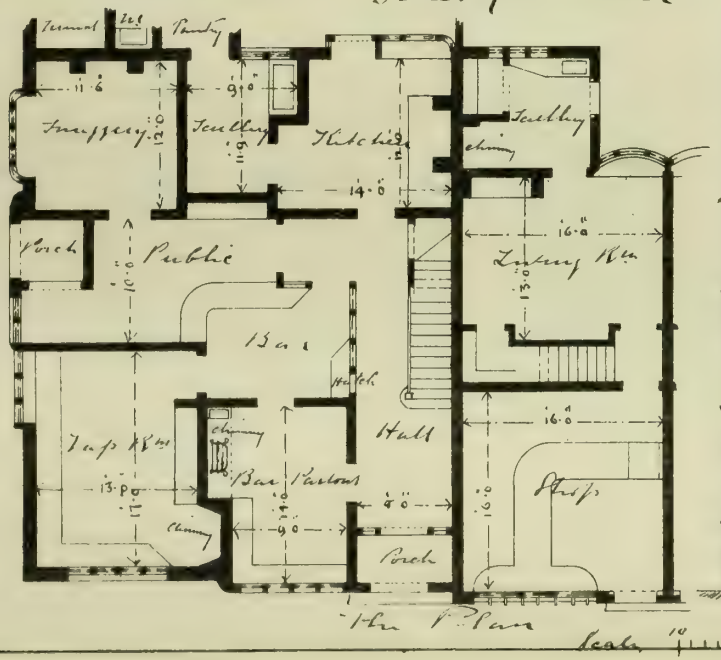
Material.— Brick and Stone for walls with red oak timbers for Gables. Park Brosley Tiles for roof



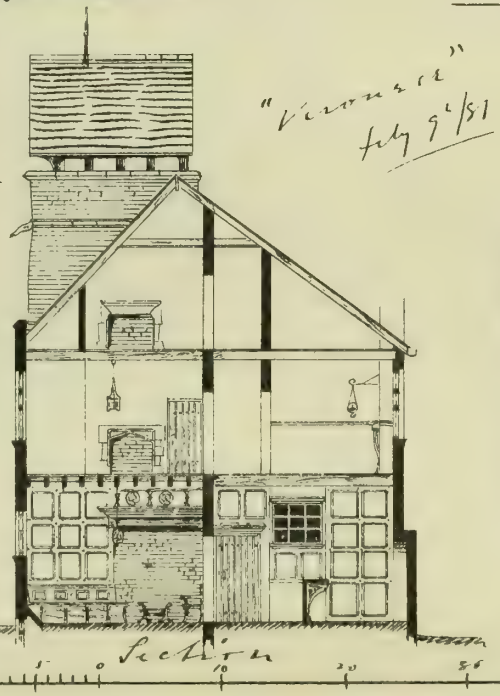
Front Elevation



Side Elevation



The Plan



"Viewed" July 9th/81

Section

The Upper Plan

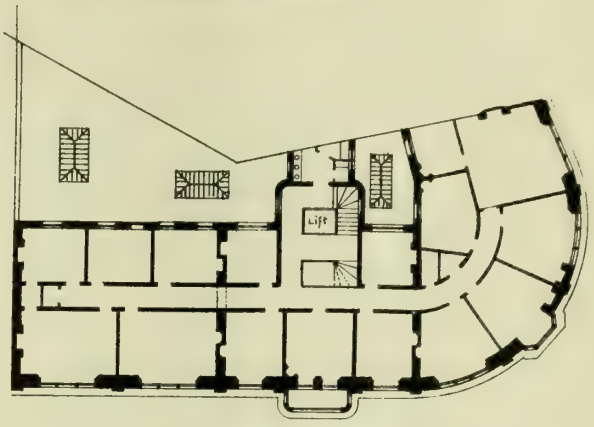
Scale 10 5 0 10 20 30 40 ft

Photo Lithographed & Printed by James Akerman 6 Queen Square W C

Proposed Buildings Northumberland Avenue Charing Cross SW

Ingram and Hollands Architects 85 Gresham Street EC

PLAN OF GROUND FLOOR



PLAN OF FIRST FLOOR

Photo Lithographed & Printed by James Akerman 6, Queen Square W.C.

GRAPHICAL DETERMINATION OF FORCES.*

MR. JAMES B. CHALMERS, C.E., has published a treatise in which the graphical method of Professor Culmann, of Zurich, is expounded, and the author observes, "were a preference for this method once established, it might then in England, as now in Germany and Italy, be built up into a systematic discipline, remarkably fitted to exercise the intellectual powers." It is singular to remark that the Continental schools of engineering are vastly superior to our own in the methods of teaching mathematics, or rather that portion of it concerned with engineering structures. As the author very justly observes, geometric methods possess a much higher value than analytical in expanding the mind, and it is on this account we can trace the superior discipline of engineers in Switzerland, Germany, Austria, Italy, and Russia. The engineers' structures are geometric conceptions, and the forces act along the lines of the figures employed; therefore, it is reasonable that the geometric conception of statical principles is the only rational one to follow. While analysis arranges problems in equations, in transforming and combining symbols, the geometric method presents the proposition under a sensible form to the mind. Poncelet, in his projection of figures, was the founder of modern geometry; Möbius, too, in Germany, followed up the geometric view of statics, and Rankine and Clerk-Maxwell's reciprocal figures and force diagrams in this country led the way to this treatment of statics. It was by the funicular polygon that Poncelet determined geometrically the centre of gravity, and others the stability and equilibrium of roofs and arches. Culmann's method, exemplified by the author in the work before us, was an improvement on the reciprocal frame diagrams of Clerk-Maxwell, as it determined the two reacting forces in the case of ordinary frames. But, though Culmann applied geometry to engineering problems generally, his system has not here met with the reception it did on the Continent, where the students were more prepared by previous teachers to receive this method of finding forces.

Mr. Chalmers' work is thoroughly practical; the application of the method is made the principal feature. A chapter on projective geometry is added. In the first chapters parallel forces in one place are treated, and should be thoroughly mastered at the onset by the student; and the older graphical methods for finding bending moment and shearing forces, as founded upon analysis, are given. Open frame-work is made the subject of another chapter, and some very interesting and elegant properties are explained. Thus the demonstration of reciprocal quadrilaterals is a very instructive one. The nature of this demonstration is that: given a figure formed of six lines joining four points in a plane, it is possible to construct a second figure composed of six lines joining four points, and such that each side of the one figure corresponds to a side of the other parallel or perpendicular to, or making a given angle with, the first. The two figures are called reciprocal. Methods of obtaining force-diagrams by sections, independently of line of action of resultant, are explained; simplifications that can be introduced are discussed; and the examples of finding the force diagrams of girders with booms, and of roofs of various forms, will be studied with much interest. Reciprocal force diagrams are fully discussed, and their application to wind-pressure and other requirements are made the subject of investigation. Hinged arch-work has various valuable applications in construction, and the author proceeds to apply Heuser's problem to such conditions of structure. Arches loaded in any manner can be treated by the graphical method. Various forms of bow-and-string girder, moments of inertia of the cross-sections of beams, are among the numerous examples given to which the method is applicable. The arch is fully considered in Chapter V.; the lines of resistance and pressure are all to be found graphically by diagram, and M. Durand Claye's method of finding the admissible lines of pressure is given by an example of a stone arch. For investigating the stresses, Heuser's method may be used, an example of which follows. Retaining-walls form a useful chapter, after which projective geometry, including harmonic ratios and conics, are treated. The examples are fully illustrated with neatly-engraved diagrams; and, though some of these look rather complex, the student will quickly begin to appreciate a method which shortens tedious labour, and gives results by a quicker and less irksome mode of procedure.

We are sorry the introductory part of Mr. Chalmer's treatise is not a little less mixed up with symbols than it is, and a little clearer explanation of graphical principles would have been welcomed by a large number of students who enter upon the subject for the first time. The notation also is somewhat elaborate and intricate in parts, and may deter many from commencing the study. In discussing the methods of sections and that of reciprocal figures, it appears to us the author has not very clearly defined the differences between the two, and perhaps on the whole a briefer treatment of the subject would have facilitated the study. The work, however, will be found of great use to those who have mastered the elements and are desirous of prosecuting their study of practical examples by the most approved means within their reach. Mr. Chalmers' book shows that the most complex structure can be investigated, and that the graphical determination of forces is not confined to any work subject to stress.

* Graphical Determination of Forces in Engineering Structures. By JAMES B. CHALMERS, C.E. London: Macmillan and Co.

SANITARY SCIENCE IN AMERICA.

AS in other scientific directions, American engineers can boast of having accomplished a great deal during the last few years with regard to the sanitary improvement of their towns. In many instances, it is true, sanitary reconstruction has been forced upon the authorities of towns, as in the case of Memphis, where the epidemic of 1878 compelled the local authorities to do something. A rather interesting paper and discussion are reported in the American Society of Civil Engineers' *Transactions*, relating to this town. It would seem that previous to 1878 no public sewers existed, and the refuse and filth were delivered into cesspools, not a little finding its way into gutters of the streets, vaults, &c. Nicholson's pavement, it is said, had been put down, and had become decayed, and so absorbed much of the liquid, making matters still worse, as the surface became so permeated that it was a constant source of poisonous exhalations. Mr. G. E. Waring, sanitary engineer, was consulted by the Commission. The "separate system" of sewerage was proposed, the surface and subsoil drainage being excluded from the sewers proper—a principle adopted in many English towns, as at Oxford and Reading. Rainfall was not necessarily entirely excluded from the sewers, and Mr. Waring has advocated the introduction of rain-water occasionally. By the adoption of the automatic flush-tank of Mr. Rogers Field, C.E., in connection with the head of each branch sewer, and filling these from the water-mains, all difficulty in flushing the sewers was overcome, and the estimated cost of the system was only one-tenth that of a storm-water system. Small sewers without manholes were recommended, and a flush-tank of 112 gallons was to be placed at the head of every branch. After much delay, occasioned by opposition, the work was sanctioned, and Mr. E. C. Metcalf was the engineer in charge, and Mr. F. S. Odell, C.E., the writer of the paper describing the works, undertook the place of assistant engineer.

We may quote here from the description given:—"The main sewers were located along the bayou, and ran in a general direction parallel therewith. For about 4,000ft. from the outlet, one main sewer was built of brick of 20in. diameter to the junction of the two main pipe sewers that ran on opposite sides of the bayou, that on the west side being 15in. and that on the east side 12in. diameter; these decreased in size to 10 and then to 8in. diameter at the upper end." The lateral sewers were generally of 6in. pipe, and the size was regulated by allowing a carrying capacity of about 280 gallons per day for each city lot of 25ft. front, the sewers to run from two-thirds to three-quarters full. For the subsoil drainage, ordinary agricultural drain-tiles, with open joints, were laid in the trenches with the sewers. The grades were slight; in some parts a grade of 1 in 600 was allowed. Two outlets, one for high and one for low water, are provided, and the sewage can be turned into either at pleasure by means of a swinging section working in a brick chamber. The sewers were laid on an average of about 6½ft. below the surface, as few of the buildings have cellars.

Many useful details are furnished by Mr. Odell as to the methods of laying, the difficulties experienced, and the manner Field's flushing-tanks were built. A section of the tank is illustrated. The many advantages of the system are enumerated by the author. Among these are the greater cleanliness and cheapness, as the pipes are kept constantly flushed and a large brick sewer is saved, with its manholes and other appliances. The discussion which followed the paper shows clearly that, notwithstanding the clear gains of the separate system, sanitary opinion is not unanimous in its adoption. As Mr. Philbrick said, there were certain limitations to the general adoption of the plan, and he pointed to Albany and Boston, where the surface water cannot be ignored; and the cheapness of the "separate system" necessarily depends upon local conditions. In New York and large towns also, the surface water becomes as filthy as the sewage, and is better conveyed away at once. Other engineers think the omission of manholes a great defect in the system. At any rate, the system as carried out at Memphis seems to be attracting attention, and the results of the experiment will be looked for with much interest. Without pre-judging the merits of the case, we are inclined to think the underground removal of storm-water is almost imperative in many large towns where the rainfall is abundant and the levels not conducive to a speedy clearance; but there are numerous cases where the separate system can be carried out with manifest advantages. An important question was raised by one speaker as to the effect of the flushing-tanks: whether the initial velocity is not soon lost, so as to become of little use at points situated at some distance from the tanks. The flushing tank must be largely depended on in doing the work of storm-water cleansing, and there is this element in the question which must be settled before any town will be warranted in adopting a system which, in every other respect, appears a very reasonable and the least costly one. The objections raised against the Memphis sewerage, and answered in detail by Mr. Waring, may be profitably read by all engineers and surveyors.

GOTHIC ARCHITECTURE.*

A SEVENTH edition, with additions, has been published of the late Thomas Rickman's well-known "Attempt to Discriminate the Styles of Architecture in England, from the Conquest to the Reformation." The new edition has been again revised by Mr. John Henry Parker, M.A., F.S.A., than whom probably no one more fitted for such a task could have been found. The original text, as left by Rickman, has been retained, and the additional matter is distinguished by being placed between brackets, or introduced as foot-notes. Comparing this edition with the last, few alterations or additional paragraphs appear on first sight; and except that the sheets of the new edition have received the benefit of supervision by the late Sir Gilbert Scott, the work is practically the same. One omission has been made, and that is the short appendix of Rickman, which had served as an introduction to the Mediæval styles, and which, to give room for other matter, has been transferred to another work, to be issued as an appendix. This last volume is intended to treat the style to which Rickman had applied the term "Anglo-Saxon," as a whole.

Any attempt to discriminate the styles of English Mediæval architecture will probably now be thought superfluous by many, as other and more scientific methods of classifying examples will suggest themselves to the student. But whatever may be said on this question, Rickman's work has withstood adverse criticism throughout a most eventful era in the history of revived styles. Its classification, at once simple and popularly understood, does not appear likely to fall into disrepute with the profession, while the practical and original remarks of the author,

*An Attempt to Discriminate the Styles of Architecture in England. By the late THOMAS RICKMAN, F.S.A. Seventh edition, with considerable Additions by JOHN HENRY PARKER, F.S.A. Parker and Co., Southampton-street.

and the exceedingly well selected wood engravings and plates with which it is illustrated have made Rickman a standard text-book on Gothic architecture.

As in the former editions, the work begins with an introductory essay on Classical architecture, in which the Five Orders are detailed. The historical appendices of records of buildings which follow the various periods will be found of value, and the plan and sketches of Canterbury crypts, and the introduction of the plates illustrating the parts of cathedrals, are useful additions to the work as formerly published. The work is handsomely got up, and has a comprehensive glossarial as well as topographical index.

KERAMIC ART OF JAPAN.*

MANY of those who have seen the two superb volumes by Mr. G. A. Audsley, architect, and Mr. J. L. Bowes, entitled the "Keramic Art of Japan," will be pleased to hear that the authors have been induced to publish a second edition of their great folio work in one volume at the very moderate price of £2 2s There were not very many students who could afford to become the purchasers of the original work, and we think the authors have done a great service for art by bringing out the present handsome volume at so reasonable a price. The volume of imperial 8vo, published by Messrs Sotheran and Co., is handsomely bound in red cloth, suitably enriched, and contains thirty-two plates, sixteen of them being in gold and colour, besides all the text of the folio edition and numerous wood-engravings. The work has been printed and illustrated in the same magnificent style by the same artists, and contains additional matter relating to the potters of Japan, and a collection of marks and monograms. We can say little more than we have already done when reviewing the original work in praise of the surpassing beauty of the exquisitely-printed chromo-lithographic illustrations, the work of MM. Firmin Didot et Cie, of Paris; and no artistic work of modern times has surpassed these almost perfect copies of the originals. The introductory essay on Japanese art, well illustrated by photo-lithographs, autotypes, and wood-engravings, is a valuable and interesting contribution, and may be read with profit by all students and artists. We have, on a previous occasion, referred to the essay. The methods of dividing surfaces into unsymmetrical and irregular spaces, so peculiar to the art of Japan, are well explained. Several illustrations of geometrical diapers—some broken so as to produce detached and irregular masses of diaper, will be found; and the subject of spacing and repetition, which the English artist so likes, but which the Japanese tries to avoid on every occasion, is well treated. Other elements of decoration, such as foliage and flowers, fabulous animals, dragons, tortoises, birds, &c., are to be found discussed and illustrated, after which the Keramic Art of Japan forms the subject of another section. The several provinces, beginning with Hizen, are superbly illustrated by specimens in full colours and gold. We need only mention the beautiful triple gourd-shaped bottle of Arita porcelain, and its lovely ornamentation and colours; the manner the middle and upper bulbs are treated, one with spiral sprays, and the top with light-spray of red *ume* pendent from the neck. Some circular blue dishes, painted with diaper-work in four compartments radiating from the centre, are remarkable fine instances of the Japanese taste in treating surfaces of this kind. A tea-bowl of Satsuma ware, Plate XVII., shows a similar principle applied to the lower surface, the diapers being arranged in six compartments, these bounded by spiral radiating lines from the base. The patterns are all varied, both in design and colour, and are executed in red and green enamels, richly gilded. Kaga ware is also instructive as affording examples of varied artistic treatments; red and gold are, however, the favourite modes of decoration. Overlapping medallions with figure subjects, landscapes, &c., belts, coiled dragons, fish, and seaweed, on reticulated grounds, are frequently met with. Plate XXI., a basin of red and gold-ware with tortoises, and other animals, is a magnificent example of this style. The deep solid red ground, and the gold frets and figures, are particularly noteworthy features of this fine example in the possession of the Duke of Edinburgh.

The Hizen ware on Plates XIII. and XIV. are also fine examples; and the Satsuma tray, and dish, and vases on Plate XVI., and the bowls on Plate XVII., and the Kaga basin are alone full of suggestion to the decorative artist. No less than 32 plates are given, chiefly in colours, and we know of no other work of the same price which furnishes illustrative examples of such beauty. The colours and delicacy of surface ornamentation of many of these selected specimens, whose transcripts are so perfect themselves, constitute a school of decoration for our younger ornamentists that cannot be prized too highly.

* Keramic Art of Japan. By George A. Audsley and James L. Bowes. London: Henry Sotheran and Co.

STONEHENGE.

DURING the Congress of the British Archæological Association, at Devizes, in August last, Dr. J. S. Phené, F.G.S., read a paper on the subject of Stonehenge. This led to a wish being expressed that Dr. Phené should act as guide on another occasion, and personally explain and point out the various interesting features of Stonehenge. Accordingly the Geologists' Association arranged for a visit, with Dr. Phené as director, and on Monday they visited the ancient monument. After examining every portion of the remains, Dr. Phené said:—The sublime in which we are assembled consists of monuments of, I think, two eras, with a vast lapse of ages between, and while the more recent is hoary with almost decades of centuries, the older indicates a multiple of the date of the more modern by a figure the magnitude of which it is difficult to fix. There must have been ancient examples of circular temples from which the Greeks and Romans copied. But if no such examples had been known before, the Romans would have found them abundantly in Britain. But in my address at Devizes I mentioned that in my recent examination of monuments in the Mediterranean islands I found similar lithic arrangements still existing in some of them, notably in that of Minorca. Not only are there circular walls, inclosing areas, like the external fosse we see here, not only circles of upright monoliths, like the circle of the more ancient stones of this structure, but stones superimposed on upright stones, forming bilithons, trilithons, and pentalithons; the two latter evidently being solemn ways of ingress to some sacred rite or position, as was the doorway of a temple. Trilithons are found in Africa, in the Balearic Islands, and along the route of an unknown people who, probably even before the foundation of Rome, conveyed overland, through Gaul, the metallic products of Britain and its isles, and they apparently terminate northwards where we now stand, and in the adjoining district of Marlborough. They seem the evidences of a distinct and peculiar race, as in one route only (*i.e.*, the route of the tin traffic through Gaul from Britain to the mouth of the Rhone and thence to Africa) is this peculiar indication of a temple found. I think the suggestions of former antiquaries, that there existed here an oval arrangement of trilithons of the older stones, were correct. There are so many traditions of the conveyance of sacred stones from place to place, and even to these islands, that it is at least no new idea that they may have been imported by holders of a faith conveyed to these islands by, or as, new settlers, and if so they would have had a special reverence; but it is evident they are foreign to this locality, and if their local origin be Wales or Cornwall, that will answer all I propose for your consideration In the time of Cæsar, the whole Channel Fleet, British and Continental—a fleet of magnificent ships, as Cæsar himself testifies—was summoned to join the naval force of the Veneti off the coast, where the other great lithic monument of Europe—Carnac—overlooks the sea. Cæsar destroyed the fleet. I have shown in the *British Archæological Journal* for the March quarter of 1878, vol. xxxiv., the consequences of the destruction of this fleet, and I now submit to you this further point. I have shown that Cæsar really came to Britain to re-establish the traffic in and the transit of tin, which he had destroyed with that fleet, as an evidence of which a new route for that material through northern Gaul was established. Cæsar states that he levied a tribute on the Britons, and Strabo asserts that he returned from Britain with "great booty." Now we know that the natives had nothing to pay in but *tin*, for his ships could not have taken flocks and herds or grain, and Strabo says tin and lead were their articles of exchange for what was required from the Continent. In this state of things a place of rendezvous became indispensable—a sacred spot where the oaths of the contracting parties would be effective. For the people of the south and east Avebury would suffice as a place for solemn contract. But the people of the far west must equally engage and swear on their sacred stones or in one of their own temples. To do this a temple, probably the most, or one of the most, sacred, must be transported. And here—as was the old Phœnician custom—they could deposit their tin ore, and the other side could bring their flocks or corn, and leave them in payment. This Phœnician custom still exists in some of the trade ports of the Erythrean Sea, now the Indian Ocean. If we may assume such a case as this, and that these smaller stones were so transported here, we can readily understand that when the Romans came to settle in the island, and whether or not they became acquainted with the cause of the institution, this would become the great spot for communication with the people of the east and west, and that here the Romans would do honour to the country by instituting games, and raising as an honorary edifice a grand imitation of what they found existing, in which both the people of the plain and hill country might from time to time swear fealty and renew their pledges of good faith. No other spot in Britain contains such evidences of Roman public assemblage as this, shown by the cursus, a magnificent work to honour the use of the British chariot, and much larger than the Roman stadium, and in selecting a spot they would have chosen that one of all others where the greatest assemblage of the different tribes took place, which Avebury on the one hand and this apparently Phœnician temple on the other indicate would be the locality.

DISTEMPER.

CEILINGS and walls are often finished in distemper, but very often turn out unsatisfactory from the want of knowledge in the mixing and laying on. Absorption in the wall should be checked or stopped, or one part will absorb more colour than another, and an uneven or spotty appearance results. Various preparations are used for preparing walls and to stop absorption. One of these is to mix about a dozen pounds of the best whiting with water, adding thereto enough parchment or other size to bind the colour, about 2oz. of alum, and the same weight of soft-soap dissolved in water; mix well and strain through a screen or coarse cloth. In mixing the distemper, one writer says, "two things are essentially necessary, clean and well-washed whiting and pure jellied size." The whiting should be put to soak with sufficient soft water to cover it well and penetrate its bulk. When soaked sufficiently, the water should be poured off, which will remove dust from the whiting. It may then be beaten up to a stiff paste by the hand or spatula. Size is next added and mixed together. Care should be taken not to break the jelly of the size any more than can be avoided. Another caution is that distemper should be mixed with jellied size to lay on well; the colour then works cool and floats nicely, but when the size is used hot it drags and gathers and works dry, producing a rough wall. A little alum added to the distemper hardens it and helps to dry out solid and even. The best size is made from parchment clippings, which are put into an iron kettle filled with water and allowed to stand 24 hours till the pieces are thoroughly soaked, then they are boiled for 5 hours, and the scum removed. The liquid is then strained through a cloth. For mixing colours the whiting and the colour required, finely ground, are dissolved separately and then mixed to the required tint. For example, lamp-black mixed with whiting makes grey, and the most delicate to the darkest shades may be obtained. For French grey the whiting required is taken and soaked in water, and Prussian blue and lake finely ground in water are added to produce the necessary shade or tint. Buff may be made by dissolving in like manner, separately, whiting and yellow ochre. A little Venetian red gives a warm tone. A good salmon tint is produced by adding to the dissolved whiting a little of the same red, just sufficient to tinge. Drabs of various tints can be easily made by grinding up finely a little burnt umber and mixing it with the dissolved whiting. The sooner the distemper colour dries after being laid on the better, and the best plan is to close windows and doors during laying and throw them open afterwards.

Building Intelligence.

Narberth.—The parish-church of Narberth, Pembrokeshire, was reopened on Tuesday, April 19th, after being entirely remodelled and in great measure rebuilt from the designs of Mr. T. G. Jackson, of London. The present church, though some of the walls of the preceding building have been kept, is practically a new one with the exception of the tower. This is one of the so-called Flemish towers of the type common in Pembrokeshire, combining the features and functions of a campanile, and a "peel tower" or border fortress. It has the peculiarity of a second vault near the top as well as the usual vault to the lowest stage which opens into the nave as a transept. A turret stair is cleverly contrived in the S.W. angle, the lower part of which, with the original door, had been disused and blocked, but was discovered and restored during the present works. The plan of the new church consists of a chancel with narrow aisles extended considerably eastward of the former building, and a nave of unusual span equal to the width of both chancel and chancel aisles, with which it communicates by a triple chancel arch, the middle arch being wider than the other two, and the three disposed on a polygonal plan. The nave is lighted by a series of long two-light windows on the south, and on the north opens into the tower about midway of its length, and by a wide arch into a north aisle, occupying the space eastward of the tower, and containing still further to the east an organ-chamber and vestry. The floor-tiles were supplied and laid by Mr. Godwin, of Lugwardine. The number of sittings provided by the new church is 398. Forest of Dean stone has been used for all exterior, and Bath stone for interior masonry, and the rubble walling is of grey mountain limestone mixed with various agglomerates and sandstones found in the vicinity.

Weston Beggard.—The work of restoring and improving Weston Beggard Church is in active progress, at an outlay of £1,000 or £1,100. The new work consists mainly of a new roof to the chancel; the roof of the nave to be restored; tower and porch to be restored, and the whole fabric to be restored wherever it is wanted. The restoration is to be carried out from the plans of Mr. T. Nicholson, the diocesan architect. The tender of Mr. W. Cullis, builder, Victoria-street, Hereford, has been accepted to carry out the work.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Birmingham Architectural Association.—An ordinary meeting was held on Tuesday evening (the 12th inst) at the rooms, Queen's College. An apology for non-attendance was received from Mr. R. B. Morgan, the Chairman, and in his absence Mr. H. H. McConnal presided. A vote of thanks was passed to Mr. John L. Pearson, R.A., F.R.I.B.A., of London, architect of the new church of St. Alban, Conybere-street, Birmingham, for permitting the members to visit that building on Saturday, the 2nd inst. A vote of thanks was also passed to Mr. N. W. Vickers, clerk of the works, for meeting the party. A paper on "Bricks and Terra-Cotta" was read by Mr. Enoch Wood, of West Bromwich, and was followed by a discussion, after which a very hearty vote of thanks was accorded to Mr. Wood.

Norfolk and Norwich Archæological Society.—The 36th annual meeting of this society was recently held at Norwich, Archdeacon Perowne presiding. The annual report was of an encouraging character, and mentioned that in the excursion of last year to the neighbourhood of Bungay, the little-known earthworks at Darrow-wood were investigated and found to belong to the class of pre-Norman castles, with a circular mound and ditch and base-court at the foot, so that another, although small example, has been added to the list of Norfolk Saxon castles. The cash account showed a balance in hand of £413 5s. 3d. The Dean of Norwich, Dr. Goulburn, was re-elected president, and Sir Thos. Beevor was added to the list of vice-presidents. Papers were read by the Rev. W. F. Creeny on "Foreign Brasses"; by the Rev. C. R. Manning, "Notes on a Brass Shield at Pulham St. Mary"; by Mr. John Gunn on "A Stone Cross at Sidestrand"; and by Dr. Jessop on "Celibacy of the Clergy." It was announced by the secretary that the Lincoln and Northampton Archæological Societies will hold a combined meeting in West Norfolk on the 13th and 14th of June next.

The Glasgow Institute of Architects.—A general meeting of the Institute was held within the writing chambers of Messrs. William and C. J. MacLean, St. Vincent-street, on the 12th inst. Mr. John Honeyman, the President, occupied the chair. Messrs. Alexander John Williamson, architect, 196, St. Vincent-street, and James Archibald Morris, architect, 46, Newmarket-street, Ayr, were admitted as members of the Institute. Messrs. John Burnet, I.A., 167, St. Vincent-street, and James Thomson, I.A., 88, Bath-street, were reappointed trustees of Haldane's Academy of the Fine Arts for 1881-82. Mr. Honeyman, President, and Mr. Sellars, Vice-President, were appointed delegates from the Institute to attend the general conference of architects to be held in London next month. Thereafter some other business of a formal character was transacted.

CHIPS.

A drinking-fountain has just been completed in Boscawen-street, Truro, by Messrs. Freeman. It stands about 9ft. high, and is constructed of polished Mabe granite, except the basin, which is of Penzance granite.

A new Free Church was opened at Queen's Cross, Aberdeen, on Sunday. It is built of grey granite, and has a tower and spire rising to a height of 145ft. Sitting accommodation has been provided for 800 persons at a cost for erection of £7,000. Messrs. Pirie and Clyne, of Aberdeen, are the architects.

Mr. F. Charlton, C.E., for many years county surveyor of Northumberland, died suddenly on Saturday week at his residence in Tynemouth. Mr. Charlton was articled to the late Mr. T. E. Harrison, railway engineer, of South Shields, and whilst in that office assisted in preparing plans for the formation of the Stanhope and Tyne Railway, one of the earliest lines constructed in the United Kingdom.

The parish-church of Freston, near Ipswich, has just received a new reredos of three panels, carved with the Agnus Dei, the Alpha and Omega. The carving has been executed by Mr. Stopher, of Ipswich, who has in hand oak benches and choir-stalls for the same church.

The Lambeth board of guardians last week received the award of Mr. Stevenson, the arbitrator, in the dispute that arose between Mr. Taylor, the contractor, and the board, as to "extras" with reference to the building of the new infirmary. Mr. Taylor claimed £6,000, and the matter was referred to arbitration, but has been long delayed owing to the illness of Mr. Stevenson. The award was taken up last week, and proved to be to the effect that the contractor was entitled to £13 1s. 1d. for extra work.

New board schools are in course of erection at Swadlincote, Leicestershire. Accommodation is provided for 123 boys and 123 girls, and 160 infants, at a cost, including site, of £4,107 11s. Mr. John Slater, of Swadlincote, is the contractor, and Mr. Josias Wells the clerk of works.

An extensive sea-wall is about to be built for the protection of Seaford, near Newhaven. Messrs. Lee are the engineers, and Mr. William W. Turner is the resident engineer. Mr. Seed, of Seaford, has contracted for the labour and plant required, and Messrs. Elphick, of Alciston, for the line.

The board of guardians for St. Saviour, Southwark, last week sealed a contract for the purchase of a site adjoining Champion-hill railway station, Dulwich, on which they propose to erect a new workhouse.

Mr. Yeo, builder, of Torquay, on Wednesday week broke his arm by falling from a scaffold, while superintending building operations.

A loan exhibition of works of industry and art, for the county of Kincardineshire, is to be opened at Stonehaven on the 20th prox.

The Wigton board of guardians last week approved plans prepared by Mr. J. S. Mark, architect, for the erection of new vagrant wards, and other alterations at the Wigton workhouse.

A new reredos at Bickleigh Church, Devon, and a new chancel screen in Butterleigh church, in the same county, were uncovered on Easter-day. Both have been executed by Mr. Hems, of Exeter.

The chancel-roof of Stowmarket parish-church is being rebuilt, and boarding will be substituted for the present plaster ceiling. Mr. Gibbons, of Ipswich, is the builder.

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[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

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Correspondence.

ELECTION OF PRESIDENT, R.I.B.A.

To the Editor of the Building News.

Sir,—There appears to be much misapprehension as to the working of By-law 26, in the nomination of candidates, for the office of President of the R.I.B.A. Many seem to believe that the nominee of the council, if not deliberately chosen, at least carries the general vote and sympathy of that body, and that to oppose his election by nominating some one else is to run counter to their express advice and wishes; now so far from this being necessarily the case, the exact reverse may happen under the present system. The council are compelled by the By-law to nominate the senior Vice-President, and failing him the next, and so on in rotation. Whatever may be their opinion as to the superior claims and fitness of any one else, however strong and unanimous that opinion may be, and however exceptional and peculiar the circumstances, they are absolutely powerless, and have no means or opportunity of conveying their views to the general body of the Institute. Under these circumstances, and in the firm belief that a by-law imposing such restrictions is directly opposed to "the true intent and meaning" of the Charter of the Institute, I have taken care in the present instance to assert my right openly to express an independent opinion. I do not hesitate, therefore, to say, publicly, that although a member of the council which has, under the compulsory terms of this by-law, nominated Mr. Horace Jones, I do not

think him at the present juncture the fittest candidate for the office of President. Personally, I have no feeling but what is friendly towards Mr. Jones; I fully recognise his claims (under the by-law), and his position in the profession; but, apart from all personal feelings, claims, and interests, which surely ought not to enter into a question of this kind, I think that the Institute would make a very grave mistake were it any longer to pass over Mr. Street, who is universally admitted to be the first architect of the day, and as such the proper man, in my opinion, to be our next President. I hear rumours of his being asked to withdraw: I hope, and confidently expect, he will do nothing of the kind. He is pledged to his supporters (to myself among the number) to stand if nominated, and to serve if elected, as I sincerely trust, for the interests of the Institute and of the profession, he may be. If every one will vote according to his honest conviction of what will be most conducive to those interests, no one can quarrel with the result.—I am, &c.,

Arthur W. Blomfield.

6, Montagu-place, W.C., April 19.

Sir,—I am sorry Mr. Roger Smith should fail to discover any *principle* to justify the promotion of Mr. Street's election.

Truly, it is no question of petty differences of opinion as to styles of architecture. It is no mere question even of meritorious desert.

If no principle were at stake, I, for one, should be extremely sorry to seem even to cast a slight upon Mr. Horace Jones's deserving position, or upon what he has done in the cause of technical examinations for the Institute, although I may question whether he has done so much in this direction as even Mr. Spiers. But it is entirely in spite of, and not because of, Mr. Jones's position and what he has done that the apparent opposition has been raised.

On the other hand, for myself, and for many others also, I wholly repudiate being influenced by any merely personal feeling in favour of my friend Mr. Street, or by any merely personal desire to give recognition to his services, highly and deeply as I appreciate them, in the revival of Pointed architecture; conscious as I am of their having materially and widely influenced for good the development of all art in the present generation—far more than those of any other individual member of the Institute. Nor is it upon such grounds as these that I would ask my own friends to further the movement, by casting the ballot in his favour, when the time shall arrive.

Mr. Roger Smith thinks that the Institute will stultify itself by making an alteration in the order of rotation by seniority, in accordance with the arrangement arrived at a few years ago, if it shall set aside the nomination of the council and elect an outsider. I would, on the contrary, most emphatically deny that it will be possible for the Institute to stultify itself more than it has already done by that arrangement. It has bound itself hand and foot, heart and conscience, to make it impossible, under any circumstances, not only for a few years, but for ever, for the council to nominate a rising or distinguished man as their President, or indeed new members of council, unless they shall have been years before preordained to the office by a rule which is calculated to crush out the expression of all liberty, whether of action or of opinion, in the election. On this ground alone the council ought to rejoice in, rather than deprecate, the opportunity of submitting a new name for election, and I sincerly trust that all who desire a *free* constitution in the Institute will combine to give effect to a movement which, if it gain no other good purpose, may serve to establish a precedent, and may make it possible for the Institute to elect a President, and indeed new members of council, and not merely to acquiesce in the acceptance of those promoted years ago, by a foregone conclusion, in a manner never contemplated by the original charter, or by many who recorded their vote on that occasion.

Let it not be supposed that this is a new plea put forth to cover an advance movement. When I first joined the Institute the mode of nomination by the council of an equal number of men from the Classic and Gothic ranks respectively, was tacitly accepted as a safe and prudent compromise. It is well known that, except under the most exceptional circumstances, no one put forward by the general body has the ghost of a chance against the "house list" put forth by the council. New names are not even put forward in any way *pari passu* with the members of the "house list"; but with the invidious distinction of proposer and seconder, and in an apparently self-constituted opposition to the powers that be.

Several unsuccessful attempts were made from time to time to introduce greater freedom of election, which, through a misconception, ended in a more hopeless bondage than ever.

The appointment of successors by a governing body is in some respects a source of strength and prestige; and an external move which may imply a want of confidence is to be deprecated. But if self-perpetuity of that sort is carried too far, it is very likely to result in the occasional exclusion of those who are capable of putting new life into it.

In the present instance, happily, the nomination ceases to be a case of opposing or of questioning the views of the council. Each member of the council may presumably be indifferent to the election of the one placed at the head of the list; for, as members of the council, they have at present no opportunity of expressing their own personal predilection, if they have any. The only interested motive they might be supposed to have in the matter would be that of maintaining the integrity of the charmed circle drawn round them by their vote of a few years ago.

Fellows are asked to spare the Institute the scandal and inconvenience of a contest. I am not afraid or ashamed to take my part in it. Only by those who make it a personal matter, and call up to their aid injured hopes and embittered feelings, can harm to the Institute be done. There is nothing like a good case, a well fought contest, and it may be a defeat, to bring out truth, and to establish an institution on a firm basis.

I have had no communication of any sort with Mr. Street upon the matter, but I am sure he would scorn to come forward upon any supposed ground of personal superiority, merit, or position, or indeed otherwise than in support of a *principle*, the recognition of which, will, I hope, enable every member of the council to record a vote in his favour, and to show that in the "conservation" of a great institution it is not necessary to conserve modern accretions and abuses.—I am, &c.,

William White.

30A, Wimpole-street, April 20.

R.I.B.A. CONFERENCE.

Sir,—As the sub-committee having charge of the arrangements for the meetings set apart for the discussion of architectural competitions, may we, through the valuable medium of your paper, inform your readers that we shall be glad to receive suggestions for discussion, and also the names of gentlemen desirous of taking part in the same.

Any communications addressed to us will receive careful consideration.—We are, &c.

Cole A. Adams, Fellow,
14, Holden-terrace, Grosvenor-gardens, S.W.
Thomas Porter, Fellow,
8, Victoria-chambers, Victoria-street, S.W.

BARINGS' BANK.

Sir,—In your issue of the 8th inst., Mr. William Woodward asks, What is architecture? and proceeds to criticise the above buildings in such language that, after reading it, one is tempted to ask, What is criticism? Were it not for certain practical directions in his last paragraph, we might be at a loss for an answer. In it he appeals to the voice of reason (his own, I presume), and implores all interested in true architecture to go and study the National Provincial Bank of England, and "that splendid specimen of Gothic architecture, Crosby House," and then go back to No. 8, Bishopsgate-street, and think; and if they do not come away with clear notions as to what is art and what is not, he will be very much surprised. Well, Sir, I have done as advised: I have gone during the holidays, and looked at the three buildings, and thought; and the first conclusion that forces itself on the mind is that many of Mr. Woodward's strictures on Barings' Bank are conceived in the most carping and prejudiced spirit possible; and the second, that he is not very fortunate in the specimens of art he has pitted against it.

To begin with No. 8: I found an inexpensive building, treated in an honest, simple, and effective manner; well marked from the adjoining houses by pilasters, with courses of stone and rubbed brick alternately, and crowned by a remarkably good main cornice perfectly in keeping with the style of the rest of the work. The roof would certainly have been better without the "spandrel-pieces" cut out at each end, as, though probably effective on a drawing, they are lost here in the narrow street, and the holes for the snow would have been better away; but the dormers seem all right, even though they may not come exactly over any of the openings below. The windows are, though plain, generally well proportioned, and give quite a character to the work. Mr. Woodward objects that the labels over those on first floor will allow the water to drip from the ends of the mouldings. I always thought the object of any mouldings over the heads of windows in either Classic or Gothic was, in the first instance, to protect them from the weather. Classic pediments and Gothic labels would alike throw the water off the window. Would Mr. Woodward condemn the lot "because," as he says, "they will thus obtain all the effect of architraves without the cost"? Really, he is quite *intense!* But this is a type of the spirit of the whole criticism.

Then he "goes for" the ground-floor, and particularly the principal entrance. I went inside and looked for the reason why this doorway should be so low and wide as it is, and found it had to be made to suit the walls of the old passage behind, and low because of the old floor-level above. The little side-entrance leads to the stair to the caretaker's house; and yet this self-constituted critic, disclaiming all knowledge of the interior, "takes it that the principal entrance must lead to some stables." I always thought one of the attributes of good architecture to be that it should accommodate itself to the requirements of the plan; and yet here is a critic condemning before he takes the trouble to inquire! Another specimen of the animus of the critique: given the wide and low doorway required by the exigencies of the plan, and interior arrangement—the entrance itself is exceedingly well designed, the window in the broken pediment being charmingly treated; the mouldings are also very carefully drawn, the intermixture of the stone and brick most effective; and mark how its designer has taken care that all the most exposed parts shall be in the more durable material. The jambs of the principal entrance, the side doorway, the sills of the first-floor windows, and all the wall-surface below the ground-floor windows is in stone. The "inconsistent visionaries" Mr. Woodward sneers at would probably have made all this in brick, to the disadvantage of the work accordingly. Fitness for its purpose, again, Mr. Critic, and so another attribute of good architecture.

Mr. Woodward regrets, as anyone would, that the whole face of the brickwork is not rubbed and gauged, and assumes (without knowledge again, as most people wouldn't) that the "architect was not cramped for expenditure" (that is fine English for having plenty of money at his disposal), and contends that all this "plainness" is the result of affectation. When we think of what Mr. Shaw has done in the way of richness at Queen's Gate and New Zealand Chambers, it is very unlikely he would have contented himself with such a plain building when designing a bank for the Barings, had he not been "cramped for expenditure," as our critic's phrase is; indeed, this is self-evident in several features, and in none more so than the use of ordinary brick walling for gauged work; while the fact that the pediment over the principal entrance is left plain on each side of the little window, instead of being enriched with the swags and other ornaments familiar in Mr. Shaw's work seems conclusive proof that here in Bishopsgate-street there must have been a want of funds for such purposes.

We are told to go from this bank to the National Provincial, and what do we find there? A Classic building almost monumental in design, with a range of attached Corinthian columns going the full height of the façade. Such columns must always produce a good effect, but after them there are no other features (except

perhaps the sculptured panels) that can be held up as paragons of excellence. The windows are not at all the proportions one expects in such a Classic example. The entrance doorway is even much worse in this respect, while the design of the inner-door, with the circle above it to fill up the space, is feeble in the extreme; the detail of the architraves of these openings is anything but Classic in feeling, rather suggesting picture-frames than otherwise, while the constant frittering away of the plain surfaces, as in the pedestals of the columns, &c., with a trellis-work pattern, and in little panels over the sculptures, and in the spandrels of the window-heads, goes far to destroy all the breadth of effect such a building requires. Indeed, the whole design, even to such details as the volutes of the capitals, looks more like the work of a clever decorator than that of an accomplished Classic architect. The façade is weakly treated above the main cornice; the statues look thin against the sky-line, and by contrast with the massive columns below, and to my thinking they, as well as the whole design as a composition, would have been materially improved by an attic behind these figures. Surely a much better example of Classic can be found than this, which is certainly not the work of "a Wren, a Barry, or a Smirke."

We are asked to contrast it with No. 8, Bishopsgate. In the one case we have a grandiose Classic design, the motive of which is a large banking-room, evidently built regardless of cost; on the other, a simple street-front, not of a banking-room at all, but a lot of offices of various sizes, built—as evidently—with a due regard to economy. I submit that, compared in this manner, Barings' is the better art of the two.

If Mr. Woodward has been somewhat unhappy in his type of Classic, what shall be said of his beau-ideal of Gothic—Crosby House? Perhaps the less the better. Neo-Gothic has never taken very kindly to the City, and certainly this specimen is not above the average. I commend to his careful study the top story of this building, with its row of miserable windows, hipped roofs, and wretched iron cresting against the sky-line, and the striking feature of the four chimney-shafts—none of them sham, it is to be hoped, though they look suspiciously like it—the whole business is about as lifeless as it possibly could be; indeed, the first-floor windows are about the only passable features in the whole front. "The entrance-door, sir; the entrance-door!" as Mr. Woodward would exclaim, is a singular instance of ornament misapplied and proportion neglected, worse even than the National Provincial.

If this is to be selected as a "splendid specimen of street Gothic architecture," we may well ask, What is architecture? Crosby House may be architecture of a sort. I'm afraid it is not *art*. I wonder what Mr. Woodward's friend, Raphael, would have said to it; perhaps he would have set it down to Whistler!

I went back from Crosby House, and thought that, of all the architectural criticisms lately published, this ignorant squib on Barings' Bank is about the most quite too consummately utter nonsense that has yet appeared.—I am, &c.,

April 20. J. M. Brydon.

Sir,—I entertain so miserable an opinion of such writers as "J. S.," whose letter appeared in your last issue, that I hesitate to occupy space in endeavouring to meet his talk (one cannot call it argument), because persons of his class, who probably have not the ability to particularise, can only indulge in generalities which nobody can attack, and which they themselves probably do not understand, and so on they go safely and contemptibly. "J. S." says that he wishes to "record a protest" against my "wild criticism of the front of the building," and all he does is to present your readers with a wretched *précis* of my letter, and proceeds to deliver the result, I suppose, of his "experience" (which I am happy to say is not mine), that a pure Classicist cannot admire a Gothic structure, as cannot a Goth admire St. Paul's Cathedral, and that a surveyor pure and simple cannot have reverence for Queen Anne, and then concludes his masterly composition by the telling words that "criticism to be just should be *decent* and done with knowledge."

Now it would have given us some better idea of the "experience" and "knowledge" of "J. S." if he had, instead of mangling my words, pointed out the errors of my architectural criticism, and noted the beauties which I failed to discover; for however wrong my opinions may be, it will, I think, be admitted, that I attacked the building in detail as an *architectural work*, and left it for others to refute or acquiesce in my remarks. For "J. S." to merely call attention to the "choice phrases" of my letter does nothing, except to render them *indecent* by making them his own, and to talk of "inexperience" he lays himself open to the retort that he may be an old man without the benefit of experience, and that what he has given us is from the impotence of his age, or the peevishness of his disease.

As regards the letter of "Spruce Affectation" I hardly know how to take it. I don't pretend to understand it, but I mean as to whether he intends it as a joke or as a serious exposition of his views. I must, however, at the outset disclaim altogether the manner in which "Spruce Affectation" has fastened on Mr. Norman Shaw particularly the observations which I applied generally. I did not intend, nor did I express it, that those observations were to apply to Mr. Shaw personally. I have far too much regard for him, and for the many excellent buildings he has carried out; but I attacked, and I do attack, the many monstrosities which are springing up under the name of architecture; above all I repudiate the suggestion that I accused Mr. Shaw of having "pandered to ignorant patrons." Such a sentence is not to be found in my letter. And I could not bring myself to make such an observation on so worthy a gentleman.

Well, Mr. "Spruce Affectation" divesting your letter of real or affected maudlin sentimentalism, what have you shown? That you do not understand the meaning of "True Principles of Architecture." I will tell you that they are as applicable to Queen Anne as to any other style: and if you know anything of the best examples in any and every style, you will find in them all the true principles, and none of the deceit. What is there in "Queen Anne" architecture (not the stuff now called Queen Anne) inconsistent with "reason, symmetry, unity, proportion, and beauty," and why don't you give us them? I will tell you. Because they are not *ugly*, not *intense*, not commendable to the set of fools who are now understood to belong to the family of the Maudles and Postlethwaites, because they are founded on reason, and are the positive outgrowth of refined culture; because they contain the essence of *real* life, and are not spurious growths, catching the sun of a summer, and drooping ill-begotten on a bad soil.

You make the greatest mistake possible if you think that "true principles" will "bind us in with huge columns and restored old buildings." Did I not invite attention to "Mr. Gibson's Bank," and to the Gothic building, "Crosby House?" These have not huge columns, and are not restored old buildings, but they contain all the true principles of architecture; and I leave you to choose between them and Barings' Bank, which latter is, I say, devoid of all the true principles, and *therefore* unutterably ugly. Get rid of your lily and your peacock; look at the three buildings I mention with the elements of that reasonable taste which I hope you possess, and honestly say which is the "cold statue," and which "breathing with life!"

One of the most amusing passages, however, in "Spruce Affectation's" letter is the odd mixture of names he gives us as "the greatest who are still with us;" "than whom none living are greater," viz., "John Ruskin, George Edmund Street, R.A., Richard Norman Shaw, R.A., Alfred Tennyson, E. W. Godwin, and Whistler."

Oh! "S. A.," you *are* a joker—you sly dog; but you are *very young*, and all the harm I wish you is that "your incomprehensible soul forms part of yourself, and that that soul has clothed its meaning, when it has longed to express itself, in as true, chaste, refined, and earnest way as it may be able to." *There's* a burst of "human nature" for you! Is it not *utter?*

"Spruce Affectation" mentions "human nature," and seems to imply that the Dead Revivalists, as I shall term them, follow its lessons in their works. Do they? Has not experience alone guided us in the discovery of relations most agreeable to the eye? If, for example, a man is disproportionately tall, we know it, and the effect is not agreeable; or if a man is disproportionately short, the result is the same. It is the medium between the two extremes which gives us the pleasant sensation of perfect proportion. You do not find in *nature* much that is not beautiful, but why should you not select the most beautiful of her productions? And if you do, you will find symmetry, proportion, unity, and beauty. Deviate from nature, and you get ugliness; try to improve on nature, and the result is the sort of *art* we get from the æsthetic school, which I say is bringing architecture into ridicule. I repeat, Don't be led away by these butterfly artists; don't think that they have acquired superior intelligence or refined taste; remember that taste is "not wholly the gift of nature, nor wholly the effect of art"; but it requires for true appreciation judgment and discernment. The drivellers who I trust have nearly had their day—who have filled houses with abominable, most falsely so-called, *art furniture*—who have gulled and taught that plates are to be hung up and looked at—not eaten off—men, and *women* forsooth, who have written bosh, and called it "Art in the Drawing-room," or some other catchy title; the *honest* architects who show you the *construction* of the chair, its nails and its glue, the dado and frieze children, the lily-gazers, the dreamers, the angular-shouldered ladies—they are all grossly ignorant, but unfortunately they don't know it. They will some day, when the public refuse to take houses where the porticoes and entrance-halls are not higher than an ordinary-sized man; when correct taste re-asserts itself, and "unmitigated ugliness" in houses will not be tolerated; when speculative builders find their money sunk in mansions which gentlemen will not occupy, and which will have to be converted into workhouses, or baths and wash-houses—which they more resemble than abodes of men of culture—then the day will come for "Historical *documents*" (absurd term); then the Stevensons of the future can put them under glass cases, because their duty will be "to preserve them and hand them on to posterity." "We may not like them—we may think them ugly; but that is a consideration which has no place in regard to an historical document."

I do hope, Sir, that the set of Maudles and Postlethwaites who have infested London long enough will begin to see that common-sense and reason will not tolerate them; and, I may add, that I trust when any "inconsistent visionary" again essays to teach practical people from his dream-book, he will meet with a castigation equal to that which Sir Edmund Beckett recently gave Mr. Stevenson. The dreamers require a kick now and then even to make them know that they live.—I am, &c., Wm. Woodward.

SUFFOLK COUNTY ASYLUM COMPETITION.

Sir,—According to the advertisement for designs, intending competitors were to apply for information to Dr. Eager, and the conditions describe "new blocks," and specify all requirements for the same, including kitchen and recreation-hall, &c.

On applying at the asylum, I was told that Dr. Eager was away, *in London*, where he had been for some time, and that competitors had full particulars given them in the "conditions" which were issued to them.

The site was shown divided from the present asylum buildings by a road, and competitors were instructed to make a connection between the two by a bridge or tunnel.

On my asking to see the old plans of the asylum, I was informed that none of the competitors were to be allowed to see them.

By the description of the premiated design in the Building News, an entire departure from the conditions of the competition is shown. The proposed buildings are *not even on the site* shown to the competitors; and instead of the design providing "new blocks," the old buildings are simply altered.

Surely this is another instance of the unfairness with which competitions are carried out and are decided without the slightest regard being given to the expenses which necessarily have to be incurred by competing architects. Had the magistrates simply intended altering the old buildings, why advertise for designs for "new blocks, &c.," and issue conditions minutely describing the same?

The question must naturally arise: Had the

successful competitor special instructions issued to him alone?—I am, &c.,

A Disappointed Competitor.

P. S.—I may also mention that the plans had to be delivered on the night of Friday, the 1st inst., and the decision was known in Ipswich on the following Wednesday, so that four days was considered by the committee sufficient to decide on the merits of 10 sets of plans.

LATERAL PRESSURE OF EARTH-WORK.

Sir,—In your notice of the paper on this subject by Mr. B. Baker (Building News, April 15), it is stated that "the author dealt with the lateral pressure of earthwork, as distinguished from the text-book pressures"; and also that, "as a result of his own experience, the author made the thickness of retaining-walls in ground of an average character equal to one-third of the height from the top of the footings."

If you will refer to the "Science of Building," published in 1870, you will find that in ground whose natural slope is 30°, the thickness of the retaining-wall (when the earth is level with top of wall) is calculated to be ·3444 of the height, and when the natural slope is 45° the thickness is ·2473 of the height, which agrees very nearly with the results obtained by Mr. Baker in his long practical experience.

In making these calculations the factor of safety is allowed for by taking the moments of forces about a point one-eighth of the wall's thickness within its base, instead of the extreme outside edge. The only practical data required are the natural slopes which different kinds of earth assume, and when these are determined with accuracy there can be no difficulty in applying the laws of mechanics to the calculation of the proper thickness of retaining-walls.—I am, &c.,

E. Wyndham Tarn.

31, Mornington-road, N.W., April 18.

ST. PETER'S CHURCH, DROGHEDA, COMPETITION.

Sir,—It was only on this day I commenced to examine the plans for new church, and the award will not be pronounced before the end of the week. I have selected one of the leading architects, who is not competing, to adjudicate, and hope his selection will give satisfaction to all parties. Some of the competitors forwarded designs without giving the necessary instructions or motto, so that I have no means of knowing their address or plans. They may have forwarded them, but I have not received them. If any of them from London who have sent in plans call at your office, I would be obliged if they will send their address, so that their plans can be returned in case they are not successful.

I have received plans from twenty-seven competitors, and as soon as the award will be declared you will get due notice.—I am, &c.,

R. Murphy, P.P.

St. Peter's, Drogheda, April 18.

HALTWHISTLE WESLEYAN CHAPEL COMPETITION.

Sir,—We are mentioned in a paragraph in your last issue as being competitors for a Wesleyan chapel at Haltwhistle. Be good enough to contradict this statement. We were professionally consulted in this matter, and prepared geometrical plans explaining our views. We afterwards heard that our plans were considered too costly, and that several architects had been invited to submit designs in competition, in which we did not engage. —We are, &c., Hetherington and Oliver.

Bank Chambers, Carlisle, April 19.

THE TOWER OF ST. JOHN'S, CHESTER.

Sir,—The tower of the ancient cathedral church of St. John, Chester, has fallen down, and buried the magnificent Early English porch in its ruins. No one with any love or admiration for what our forefathers have done before us, but will deplore the loss that we have sustained; but is not our sorrow tempered with anger when we think that had ordinary precautions been taken, the tower and porch might be now standing amongst us?

When I visited Chester last year, I was alarmed at the visible signs of decay and danger that the tower presented, and yet no effectual remedies were applied to keep it together—no restoration of any sort. By restoration I do not mean to recase it with new stone, to put new mouldings or carvings where old ones once existed, to so transform it as to completely take away all archæological interest in it; but to prop it up, to put substantial brick buttresses where required, to do everything in our power to prevent losing such a fine relic of the past.

As Mr. Ruskin says:—"Watch an old building with an anxious care. . . . Count its stones as you would jewels of a crown . . . bind it together with iron where it loosens; stay it with timber where it declines; do not care about the unsightliness of the aid; better a crutch than a lost limb."

And yet in all England, among all our societies, architectural or archæological, there was no one to do this; and we have the crime on our heads, to our shame be it said, of having suffered an ancient tower to fall to the ground without holding out a helping hand to save it.—I am, &c,

Lewin Sharp.

84, Cornwall-gardens, Queen's-gate, S.W., April 16.

SEWER VENTILATION AND EXTERNAL SOIL-PIPES.

Sir,—First, as regards the plan of Mr. Read, C.E., to ventilate the public sewers up the soil-pipes, which he says is "the only natural, safe, and efficient point of ventilation above the roof," I have to point out that about eight years ago, in the Building News, page 156, August 8th, 1873, a much more sensible and safer plan, and also quite as "efficient," so far as the public sewers are concerned, was published and illustrated by me.

In this plan the foul air of the sewers was not to discharge "at the street level," as Mr. Read states; but the gratings in the middle of the street were to admit the fresh air, while the foul air was to be continually discharging above the roof as far from vents and windows as possible, the upward current being assisted by a ventilator. Since 1873 I have repeatedly referred to and illustrated this plan in various ways. If, therefore, private drains, pipes, or buildings are to be used to assist in ventilating the public sewers, there is a right and a wrong way of doing the work, and certainly this A.D. 1881 way of Mr. Read is not the right way.

Mr. Read says that with good sewers well ventilated, "no sewer-gas could accumulate" in them. Now, suppose we admit this, still that would not prevent either sewer-gas being generated in them, or dislodge germs being conveyed along them; hence, to prevent these getting into our houses, and accumulating in some of the apartments in them, disconnecting traps are necessary between every house and the sewer; the sewer to be ventilated, if wished, by a special pipe connected beyond the disconnecting trap I refer to. This is the really "natural and safe" plan from a hygienic point of view, and as I have said, can be made equally efficient for the sewer, so far as answering the purpose is concerned, if induced-current ventilators are placed upon the outlets.

As to the "experience of the recent frost" justifying soil-pipes being placed inside, I do not see it. This experience, to my mind, simply exposed bad planning, and bad appliances and workmanship. We know that it is only the water that freezes: hence stop the leakages that caused the freezing—*e.g.*, keep the cistern overflows out of the soil-pipe, as is the law in many cases; also, do not use cisterns with valves that leak, but use cisterns that have no valves that can leak. This would seem to be a new idea to Mr. Read and many others; but the sooner it is understood the better for all concerned—except, indeed, the makers of some valve appliances that often do not do what they are said to do.

As to Dr. Buchanan's report, I have again looked it over, and find I have not "misunderstood the facts" contained in it.

At page 46, Dr. Buchanan states that in a number of the Croydon houses that have had fever, drain-air, charged with infection from the common sewers, had entered. At page 59 he says, "the direct connection of houses with sewers must be interrupted, and an efficient independent system of ventilation be applied to every house-drain." At page 70, Dr. Buchanan does indeed show an illustration of the plan of ventilating the sewer up the soil-pipe as Mr. Read desires, but it is only to show its absurdity and to condemn it; for immediately after he illustrates a style of trapping and ventilation (similar to that previously patented by me in April, 1875), which he recommends, and he does so with all the data in connection with his examinations at Croydon fresh in his mind.

I now turn my attention to Mr. White, F.S.A., architect. His remark about the 2,000 per cent. contains a bit of a quirk. I admit having stated that the emanations from an inside soil-pipe at 400 feet per minute, especially if a long one, would often be more foul than those from an exterior pipe at only 20 feet per minute; I also stated and uphold that the air from the former would be more dangerous to the inmates than that from the latter; but take the 2,000 per cent. as I meant it to apply, to each pipe *per se*, then if the 400 feet speed were increased to 2,000 per cent. more, or 8,000 feet, then there would be no danger to the inmates from holes in the inside soil-pipe, as the great speed of the current upwards within it would suck air from the house, instead of allowing air to blow into the house!

The emanations from the interior of a vertical inside soil-pipe, all "splashed" with filthy matter, are more dangerous often than wet deposits in a horizontal drain, because, in the process of drying, particles of foul or possibly disease-impregnated matter may be more easily dislodged and carried along with the air-current, whereas these foul particles often lie amongst water, and do no appreciable harm so long as they are amongst the water; *e.g.*, the doctors say that, notwithstanding the thousands of gallons of sewage lying continually in the harbour and along the banks of the Clyde, yet they cannot point to appreciable increase of disease from that cause, the protection being from the particles of sewage being soaked with the water and not rising into the air; but let the water be run off and the sewage exposed to dry, then disease would soon appear, I would expect.

At the Philosophical Society of Glasgow, on 30th March—this week—Dr. Ebenezer Duncan referred to the danger of disease-breeding particles being conveyed into the air from the sides of sewage-wet pipes or sewers in the process of drying. I believe he based this remark on his own experience or ideas, and that he had not seen my remarks to the same purpose on page 217 of the Building News for February 25th, 1881.

I may here remark that supposing the doctors are right as to "danger" from the sewage in the Clyde, yet, to my senses, it is often most offensive and disgusting, especially in the summer-time. Moreover, at Helensburgh, where the tide ebbs and flows and leaves the beach exposed at the ebb, we have been hearing lately of complaints of a new style of disease that has arisen, and which is ascribed to the sewage. Now, take this in connection with the "drain-air," which Dr. Buchanan speaks of as being the carrier of specific infection, and we will see that all this supports what I said on page 217 *ante* as to the danger from the current of air in an inside soil-pipe drying up the sewage, and so disloging diseased particles, and if there are holes in the soil-pipe carrying these into the atmosphere of the house. Dr. Carmichael says, as the result of his late experiments, that a hole in a soil-pipe no larger than a pin-point is dangerous, and also far more dangerous, than any sewage-gas passing through the water-traps.

Now I must not be supposed to say that there is no danger from liquid deposits left lying in a badly-laid drain, for I condemn that. My object is to point out the danger from aërial emanations from vertical soil and waste-pipes; many people seeming to think that because the pipe is vertical that therefore nothing harmful can come from it; but that is a serious mistake, especially with long pipes. As to Mr. White slighting the danger of leakage "in a thoroughly ventilated isolating shaft," he is now leaving *terra firma* and away to the imaginary, and there I will leave him, as there will not be found one out of every thousand inside soil-pipes so fitted up.

Mr. E. G. Banner asserts that, in and previous to 1874, "all that anybody then thought it necessary to prevent was the ingress into the house of gas from the sewer." The past pages of the Building News, however, flatly contradict him, for *inter alia*, page 197, September 13th, 1872, says:—"A great deal has lately been said about keeping back the foul gas of common sewer from getting into house-drains, which is very well; but this is not all, for it must be remembered that foul air gathers in the house-drains and pipes themselves, independently altogether of the common sewer." To cure this ventilation was recommended in connection with a disconnecting trap between the house and the sewer. Again, in 1868, Mr. John Honeyman, architect, patented his ventilating-trap, while in 1866 I trapped and ventilated the soil-pipe with low-level inlet and high-level outlet, all which was long before Mr. Banner appeared on the scene with his unpractical fancies, which, to use his own words, I, in 1875, told him would prove "delusions and snares" to those who adopted them. Mr. Banner mentions the name of "Seddon" at page 375, and also gives out that Major Seddon, R.E., supports him in his promulgated notions. The following from Major Seddon, written only a few days since, rather disproves that, however:—

"That at first Mr. Banner thought his cowl would render traps unnecessary on baths, sinks, &c., I am quite aware, and always told him he was in error; that point, of course, he had to give up."

Now, I have been stating, too, that Mr. Banner was "in error"; but I never remember him stating publicly that he had "to give up" his erroneous views. I think we owe a vote of thanks to Major Seddon for telling us that.

Mr. Banner's small inlets and outlets are perpetually so. My small inlet was only an auxiliary one, seldom in use, and then only in cold weather, when a large inlet was not so much needed. A small outlet, however, sometimes allows of siphon

action, and is not so good as carrying up the soil-pipe the full size, especially when the soil-pipe is inside of the house; and more especially still, if, as Mr. Buchan so often shows it, baths, basins, and sinks all enter into it, as well as closets. An inside soil-pipe carried up full size is often as cheap as one diminished to 2½in., the price of 2½in. cowl being included in the latter, while the former style, with no cowl, will often be better than the latter with the *small* cowl.

As to his close traps, Mr. Banner tells us that "it is not necessary *now* to unscrew bolts," &c. I am glad to see Mr. Banner acknowledging he has been making improvements of late. I got one of his large iron traps sent me from London lately, from, I think, the residence of Mr. Henry Mitchell, M.P., and it is screwed and bolted up, and weighs about 3cwt. It looks more like a large smith's anvil than a sewage-trap. An open fireclay trap has been, I understand, put in where it was: the fireclay one would cost about one-sixth the price of the iron one, and would be better by far for the purpose, and cleaner. In some cases it is not advisable to place the ventilating-grating right over the trap. In this case an easily-movable plate may be placed right over the trap, and the fresh air admitted by a pipe led off the side, which may be carried where wished; *e.g.*, at some schools where I am at present improving the drainage, the air-pipe to trap is 6in. diameter, and is carried through a wall, with the grating set vertically in the wall, a little above the ground. The outlet is to be a 4½in. diameter strong iron pipe, carried up on the outside of one of the gables, and surmounted by a fixed induced-current ventilator.—I am, &c., W. P. Buchan, S.E.

P.S.—As above referred to, an extracting ventilator on top of soil-pipe, pulling air out of it at 8,000ft. per minute, would draw air from the house. A ventilating-pump blowing air in at the bottom would push air out at holes in soil-pipe into the house, as does the ordinary cold atmospheric pressure at the fresh-air inlet. 8,000ft. speed per minute is, however, imaginary in general practice, as I refer to at page 281. W. P. B.

Intercommunication.

QUESTIONS.

[6477.]—**Turnpike Roads.**—Will any reader kindly inform me, 1st, what is meant by a turnpike road? 2nd. Under what Act were turnpikes abolished; for what reasons, and when? 3rd. The origin of the word turnpike? 4th. Any other information on the subject likely to be of service?—Strathmore.

[6478.]—**Etching.**—Will any of your readers tell me of a manual on this subject, and inform me where to obtain it, and the necessary tools and plates?—T.

[6479.]—**Board Schools.**—Will some person kindly say if the Educational Department has issued any recent instructions, giving particulars of requirements in Board Schools, and, if so, where same can be obtained?—Nemo.

[6480.]—**Light and Air.**—The windows of some tenements have enjoyed an uninterrupted view over adjoining property for considerably over twenty years. Can the owner of the property now erect premises to interfere with the view or the access of light to the windows? Does not the enjoyment of the view, and access of light for so long a time, make the right absolute? Has distance between the new premises and the windows anything to do with the matter? If the light in the living-rooms is sensibly diminished, cannot damages be obtained for the injury? Does the question of dwellings and business premises affect the matter?—Perplexed.

[6481.]—**Brick Stains.**—I have been using some red Bridgwater bricks as dressings to cottages, but recently a sort of white stain like salt appears on the surface, and quite spoils their appearance. They have been rubbed and washed twice, but it again appears. Can any of your readers suggest a remedy or preparation to prevent same, which would not spoil or alter the natural colour of the bricks?—J. H. H.

[6482.]—**Building Construction.**—Wanted, name of a book on "Building Construction." The South Kensington book on same subject is a very good one, but there may be one or more in same style—perhaps Tarn's.—J. W. C. Haldane.

[6483.]—**Ancient Lights.**—Can one of your readers kindly inform me what term of years is now sufficient to confer the privilege of "ancient lights," and what decisions have been recently given on this point?—C.

REPLIES.

[6407.]—**Cubing a Building.**—Hugh McLachlan has clearly misunderstood my reply in thinking I did not include the footings in the cubing. I always take the height from the bottom of footing to midway up the roof. If this be followed, I do not think it necessary to price out the trenching and concrete, unless the latter are of considerable depth, when such a course would be more correct. I agree with Hugh McLachlan that concrete should be taken in all important buildings, but I think it better to allow something in the cubing.—G. H. G.

[6427.]—**Perspective of Shadows.**—The most obtainable work referring to this subject is Gwilt's "Encyclopædia of Architecture." Mr. Gwilt also wrote a separate work on the subject, but does not commend it in his encyclopædia. "The Jesuit's Perspective," published in the seventeenth or eighteenth century, is an admirable work on the subject, also on perspective and reflections. It is, however, a rare work. Another, entitled "Sciography, or the Projection of Shadows," by, I believe, Mr. Packett, has been used as an authority by the Science and Art Department, but when I tried to obtain it a few years ago I could not succeed.—Hugh McLachlan.

[6428.]—**Oak Fittings.**—"H. R. B." gives "B." some good advice relative to oak. It is curious, however, that he did not know at how many different prices the material may be procured. In your issue of the 18th ult., I passingly remarked that I had bought dry oak in plank during the previous week at various sums varying from 2s. 2d. to 11s. a foot cube. To this "B." takes exception. He has attended many timber sales, he says, and never saw oak in the tree sold for less than 3s. to 5s. a foot cube. By the timber-merchant's letter and receipt that I inclose (not for publication, Mr. Editor) it will be seen that I not only bought my dry planks, averaging 16in. wide, and which had been down six years, and sawn up in 3 and 4in. planks for two years, for 2s. 2d., but had them delivered at the railway station, 2 miles off inclusive. "H. R. B." says such a price is hardly that of fir scantlings. I have been at sales more than once where the oak was sold for lower prices than the deals. A while since I was at the sale of a bankrupt's stock in the West-country. The competition for the deals and pitch-pine between the local builders was brisk, and they went high. Then the oak, of which there was a large quantity, was put up, with the result that scarcely a bid was offered. The few small wants of those present were soon satisfied, and then lot after lot was knocked down to me without opposition. I had it for a considerably lower price than the deals had fetched. It might pay "H. R. B." to run down one of these fine days from Staffordshire into the West. There are a few things he has yet to learn, which he might pick up advantageously.—Harry Hems.

[6428.]—**Oak Fittings.**—I am much obliged to your correspondents who have kindly answered my query. Their advice will be of service on other occasions. I must say that I did not know that architects were supposed to specify the precise locality of their timber nor the price of the wood in the rough, but I can very easily understand that a better definition of my requirement is needed than what I specified, viz., best English oak. I took the precaution to require a guarantee that the wood should come from a good place, and was assured that it was grown upon a nobleman's estate, and I had the authority of his lordship's steward that it was so. It is not of small hedgegrown size, for much of it is out of stuff 18in. wide. One great defect in it I omitted to name before is that it is badly stained with "ferric" stain or dark patches like ink. I had much of it rejected on that account, but I now find that a quantity of it has been subjected to some process of chemicals to remove the dark acid, and it now shows the doctoring, and looks simply horrible.—B.

[6439.]—**Damp Walls.**—The method given by "Old Silas" is certainly not to be recommended if the bricks themselves are porous, which all are in a greater or less degree, since it only protects the joints, and driving rains will penetrate any 9in. brickwork built of porous bricks, however good may be the joints. The answer of "G.H.G." is better. I believe Ransome's indurating solution to be one of the best, if not even the best; all solutions must, however, be occasionally repeated, like paint, since no solution protects more than the surface of the material to which it is applied, and so gets worn off or washed out of the pores. Paint, and, still better, Portland cement stucco, are both effectual, but, for appearance, should be avoided. Tile-hanging looks best, and answers well.—Hugh McLachlan.

[6441.]—**Roof-Tiles.**—The best plan is to have purpose-made tiles to suit the required curves. Another method is to select those which are most curved or bent from ordinary plain tiles, using them to fit the curves as nearly as they can, and, if necessary, to cut slightly the edges.—Hugh McLachlan.

[6447.]—**Stucco Plaster.**—The old plaster should not be used again, except as sound rubbish, or ground up for mortar. For the latter purpose lime must be used as usual.—Hugh McLachlan.

[6465.]—**By-Law of the Enfield Local Board.**—"W. K." tells us that the above Board determined to enforce the observance of their laws, and failed. I believe I am right when I say that in reference to such matters it would be a very difficult thing for any Board to enforce their rules or regulations, as in scarcely any instance have they got an Act of Parliament. Strengths of timbers, &c., cannot be made compulsory on any builder unless there be a special Act. They can refuse to certify a house as being fit for habitation, but only as a sanitary question, which must be proved. Take it for a fact that Boards have considerably less legal power than they assume.—R. F. Tolson.

[6465.]—**By-Law of the Enfield Local Board.**—From "W. H.'s" published sketch, I should conclude that the part in question is a bedroom in that portion of a small house termed amongst builders, the back additions, and cannot be considered a room in the roof, as generally understood in the building trade.—A Builder.

[6465.]—**By-Law of the Enfield Local Board.**—In the borough of Burton-on-Trent, a by-law similar to that at Enfield exists. It is the practice of the borough surveyor to interpret it so as to include rooms like that referred to by "W. K." My opinion is, however, against this interpretation, and I am sure your correspondent's appeal will be witnessed with interest by all sanitarians. The intention of the by-law is to prevent the erection of such buildings as that shown in the sketch. If it does not secure that intention, the sooner it is swept away and one substituted that does, the better.—G. R. S.

[6472.]—**Plain Tile Roofing.**—(1) 30° 0′ or, at least, be a long way on the acute side of square pitch. (2) To show either 3in. or 4in. on face. (3) Yes, if bedded close, but the operation will cause dampness if proper ventilation is not provided for on the underside of the tiles. (4) Bedding in hay is all "bosh." (5) No. (6.) If the proper pitch is adopted, and if the tiles are hung on oak split laths with galvanised iron hooks, the tiles can be laid dry, and it will be good work. (7) Read (6) again. Bed all tiles on the brows of roofs, and on other exposed parts in hydraulic mortar or cement, and hang on all the rest. Very often I find only half the tiles pegged, and not more than one third of them touching the lath. This is bad work. You may be told that if all the pegs rested on the laths the lower edges of the tiles would not form a straight line, because the perforations in the tiles are not gauged properly. This objection can be met by having a wooden horse to hang the tiles to in one, two, and three classes, so as to gauge them before taking them on to the roof.—Surveyor.

[6474.]—**Breweries.**—Your correspondent, "C. S.," will probably find "Breweries and Maltings," by Scammell, 2nd edition, 1880, a suitable book.—J. W. C. H.

[6475.]—**Advantages of Centrolineads.**—The advantage claimed in using this instrument is that when once adjusted there is no time lost in drawing the vanishing lines of the building; but the main advantage gained is that the difficulty of obtaining the "points of distance," which may be some feet away from the edge of drawing-board, is obviated. By two centrolineads, both sets of parallel lines in a drawing may be drawn to their points without trouble. Directions for using the instrument have been given several times in the Building News.—G. H. G.

[6475.]—**Advantages of Centrolineads.**—Read "Mathematical Instruments," by J. F. Heather, Lockwood and Co.—Surveyor.

WATER SUPPLY AND SANITARY MATTERS.

Walsall Sewerage Works.—An inquiry was held on Thursday, and by adjournment on Monday, before Captain Hildyard, R.E., one of the inspectors of the Local Government Board, into a request from the town council of Walsall, for issue of a provisional order to enable them to acquire lands at Bescot, in Wednesbury and Walsall, for sewage disposal. Mr. William J. Boys, A.M.I.C.E., borough surveyor of Walsall, explained the scheme, showing that it is proposed to take 170 acres of land in the Tame Valley, and that about 2,280,000 gallons will be dealt with per day. The present outfall sewer, constructed at a cost of £5,826, had been made in connection with this outfall, and with the sanction of an inspector of the Local Government Board. Mr. H. J. Martin, C.E., and Mr. W. Fowler, Member Inst. Surveyors, Mr. James Lemon, C.E., and Mr. J. Till, C.E., confirmed the opinion of Mr. Boys; the opposition of the local authorities of Wednesbury was subsequently withdrawn, on Walsall undertaking to agree to a clause in the provisional order empowering Wednesbury to join in a united drainage board within three months.

CHIPS.

A drinking-fountain is about to be erected at Swaffham, Norfolk, as a memorial of the late Sir Wm. Bagge. Mr. Street has been appointed as the architect of the fountain, and Mr. Thorneycroft as the sculptor of the bust.

The restoration-committee of North Currey Church, Somersetshire, have received a letter from Mr. Newman Marks, secretary of the Society for the Protection of Ancient Buildings, in which he states that the attention of that Society has been called to a paragraph in the Building News for February 25th, 1881, which suggests that the rebuilding of a large portion of the church may be under consideration, and offering a few cautions which experience has shown the committee to be useful in dealing with ancient buildings. These cautions are admittedly based alone on what appeared in the Building News, and relate to the bulging of walls and the superficial decay of stonework, neither of which, Mr. Marks remarks, are in themselves productive of serious harm, while he protests against the introduction of Modern-Mediæval tiles, stained and cathedral glass, ornamental brass-work, and other furnishings, than which "nothing," he says, "destroys so completely the original and dignified look of an old church."

Mr. Thomas Higgs, inspector of nuisances for the city of Worcester, committed suicide last week by cutting his throat.

A window has just been placed in the St. Michael's Church, Gloucester, to the memory of Mr. J. P. Kimberley, organist of the church for 20 years. Eight figure subjects, illustrative of Christ as the Good Shepherd, occupy the three lights. The work has been executed by Messrs. Clayton and Bell, of London.

The corporation of Worcester last week adopted a plan prepared by Mr. H. Rowe, for the rebuilding of the Music-hall, at a cost of £2,000, in addition to the sum to be paid by the Insurance Company. An amendment, proposing that architects be invited to send in plans, 30 guineas being offered for the one accepted, was lost by a large majority.

Plans by Mr. T. M. Lockwood, of Chester, have been adopted for the reconstruction of the Shirehall, Shrewsbury, recently destroyed by fire. The estimated cost is £35,000.

At the Lindsey quarter-sessions, held at Lincoln last week, it was decided to erect a bridge over the Bain at Donington, from plans by Mr. Thropp, county surveyor.

Our Office Table.

An interesting discovery has been made at Durkheim, in the Palatinate, in the course of some excavations necessary for the reconstruction of the baths. An enormous iron chest, containing the celebrated treasure of the Abbey of Limburg, which disappeared after the siege of the abbey in 1504, has been found by the workmen. The treasure is supposed to have been put in safety by the abbot out of fear of an attack. It is composed of a large number of vases and other objects of gold and silver, of precious stones, and a host of coins of the 15th century. There are also a number of articles for worship, dating from the commencement of the abbey, which was opened in 1030.

Some time last week—a local journal says 10 o'clock on Thursday night, and the *Times* and other London journals 4 o'clock on Good Friday morning—the north-west corner of the tower of St. John's Priory, Chester, from base to summit, fell with a tremendous crash, bringing down about 600 tons of masonry, and completely crushing the fine porch entrance to the church. The tower is said to be over 1,000 years old, and though of solid proportions, the decaying hand of time has told on the soft sandstone which has been used in construction. From time to time for many years past it has undergone repair, and similar work has been in progress during the past few days. To this, and probably to the rain which has fallen recently, may, in the mean time, be attributed the collapse. Some years ago the tower was practically condemned by an eminent architect, who forbad the ringing of the bells. The most serious loss is the entire destruction of the massive and beautiful Early English porch and gateway. Another fall from the ruins took place on Tuesday, and it is probable that the first gale of wind will bring more of the upper part of the tower down. A parishioners' meeting has since been held, at which the vicar stated that the foundations are utterly bad, not being carried into the solid rock. It is proposed to appeal to the whole country for funds to rebuild the tower from its base.

Miscellaneous and interesting gleanings abound in the current part of "Gloucestershire Notes and Queries," and we must congratulate its painstaking editor, Rev. B. H. Blacker, on the choice of quotations made. The extracts from the registers, notes on old traditions and customs, and a variety of local folklore make the parts very interesting reading. Those interested in church restoration will read with pleasure Mr. J. E. K. Cutts' contribution on "Notgrove Parish Church," (CCCLXII.), in which he describes the recent restoration of the chancel under his directions. A Norman arcade in the nave and numerous additions, dating down to the 16th-century, may be found; but the chancel of Late 14th-century work appears to be the most interesting feature. The chancel was without an east window, and the stripping of the walls has exposed a scheme of sculptured and coloured decoration, consisting of a series of figure subjects or panels above the altar painted in fine red lines, except the dark nimbi. These represent, Mr. Cutts says, the Crucifixion and other scenes in the life of Christ; above are three larger compartments or niches. One of these on the left hand had the mouldings painted with a coloured background, having a hand issuing from clouds with other outlines of angels in red. The south niche is wider, and is similarly painted, and it is thought contained figures of the Nativity or Epiphany, while the centre niche is a sculptured representation of two seated figures which stood out from the face of wall on a projecting base, and over it there is a canopy, groined beneath, with large finial above. The figures are thought to represent the enthronement of the Virgin. A series of six figures in red lines with nimbi and yellow hair appear above this row, occupying the wall-spaces between the three finials of niches. These are in trefoil-headed compartments. Besides this remarkable discovery, other details of interest are recorded; there was a running pattern in red colour on the inner order of nave arcading or voussoirs marked on the soffits; and Mr. Cutts mentions a Roman sepulchral urn with ashes in it, found at the west end of nave. The present part contains also many passages and quotations from out-of-the-way books more or less connected with Gloucestershire, that will be eagerly scanned for the light they throw on local names and customs.

A "Manufacturers' and Millowners' Mutual Aid Association" has been organised for the mutual assistance of manufacturers, millowners, and others, who are prohibited by the Rivers Pollution Prevention Act, 1876, from permitting their refuse material to flow into any watercourse; and also for the utilisation of waste products. The reports of her Majesty's River Pollution Commissioners have from time to time sufficiently indicated the necessity of stringent legislation for the protection of our water supply; and cases are occurring daily where enforcement of the Act threatens the existence of the business of papermakers and others altogether. Moreover, it has been shown by practical results that refuse materials can be utilised by a combination of chemical and mechanical processes, and converted into a source of considerable profit. A Bill has been introduced and read a first time, in the House of Lords, which offers a way of escape for those who care to seek it. The objects of the Bill are to provide the means for complying with the Act of 1876. The provisions of the Bill are analogous to those of the Land Improvement Act, furnishing a means of investment in the development of commerce and manufactories, and the improvement of mills and similar premises by outlay of capital to the mutual advantage of both landlord and tenant. The loans will be repaid over a period of years with interest, and the series of instalments will become a charge upon both land and premises thus improved, until final redemption.

A conference of magistrates and members of the Wilts Highway boards was held at Chippenham on Tuesday and Thursday in last week, when various questions relating to the maintenance and repairs of highways were discussed. The general expression of feeling appeared to be in favour of the contract system. The present system of accounts was discussed, and a resolution declaring the previous and more detailed method of making the financial statement to be preferable to that now in use was lost. It was resolved that the "extraordinary traffic" clause of the Highways Act, 1878, requires amendment, so as to cause those who actually damage the roads to contribute towards their amendment. A report is to be presented at the next Wiltshire quarter sessions, to be held at Warminster.

We do not know whether it comes within the jurisdiction of any authority to inspect the condition of the loose gutters, slates, tiles, and chimney-pots on houses; if not, the Board of Works might usefully inquire into the existence of many of these accidental sources of danger in our streets. Not many days ago we noticed in one of the crowded streets in Lambeth two loose lofty metal chimney-pots shaking in the wind, one of which has since fallen. The gales of the past week have, no doubt, loosened many of these fragile erections, which are sometimes stayed by an iron bar. Good earthenware, terra-cotta, or stoneware should be made compulsory for chimneys, as they are far more durable and have a better appearance, besides keeping cleaner, than metal. Loose slates and tiles, gutters, broken ornaments, finials, dangerous sign boards, and rotten outside shutters are a few of the many things to which the public are exposed in our streets in all boisterous weathers, and as such fittings come, as a rule, under the care of landlords, the tenants seldom trouble about them till they actually experience some inconvenience. There seems to be an authority needed to compel owners of houses in streets to keep them in a safe state of repair before they actually require to be complained against and propped up under the Dangerous Structures clauses of the Building Act. Prevention is better than cure; but somehow our legislation proceeds very often on the opposite principle.

We have received the Sixth Part of "Modern Architectural Designs and Details," published by Messrs. Bicknell and Comstock, of New York. This work will be completed in ten parts of one dollar each, and each contains eight finely-lithographed plates of designs in Queen Anne, Elizabethan, and other styles. When the first part was received we spoke of the work, and we may now simply notice the plates of the present number. One of the best designs is the small house at Short Hills (N.J.), Lamb and Wheeler architects. Large detailed elevations are furnished, and these add much to the value of the work. We cannot approve of the other design, the details of which are of a rather fussy and too elaborate a character to meet with admiration on this side of the Atlantic. The aim of the publishers is praiseworthy, and the only hope we express is that the selection will be confined to a few creditable works of moderate cost, avoiding as much as possible all extravagance of style. The parts comprise perspective views, plans, elevations, sections, and exterior and interior details of dwellings suitable for seaside and suburban localities. One advantage in the designs is that they are drawn to scale.

A loan exhibition of works of art was opened at Newton Abbot, on Wednesday, by the Earl of Devon. Amongst the pictures on view are two paintings of the Lagoon, Venice, by J. W. M. Turner, Millais' "Black Brunswicker," the auto-portrait of and by Northcote, R.A., lent by Sir Stafford Northcote, and others by Gainsborough, Reynolds, and more recent artists. The principal feature of the exhibition is, however, the display of terra-cotta, porcelain, and pottery, including not only South Devonshire examples, but also specimens of Limoges enamels; of Swansea, Dresden, Viennese, and Turkish china; Derby, Sèvres, and Japanese porcelain; Moorish, Chinese, and Japanese, Mexican, and New Guinea pottery. Mr. Harry Hems, of Exeter, shows portrait medallions in statuary marble of Archbishops Tait and Manning, of Canterbury and Westminster, and two carved panels in English oak. He also exhibits a collection of ancient tiles, comprising specimens from Nuneaton Abbey, Salisbury Cathedral, and many West of England churches, and others from Pompeii, Persia, Spain, and Holland. Amongst the other exhibits at Newton Abbot are mosaics, tapestry, and lace.

At a meeting of the Royal Scottish Society of Arts last week Mr. Alexander Frazer, M.A., optician, communicated a paper on "A Form of Ball and Socket Level," for which he claimed the advantage that it could be used either with or without the ball and socket. In the discussion which followed, a general opinion was expressed that many of the suggestions made by Mr. Frazer had already been adopted or tried and given up, and that the ball and socket level was generally used in preference to the common level. After some additional remarks from Mr. Sang, who spoke strongly in favour of the old English level, and who pointed out that a perfectly straight level could not be got, the communication was remitted to the committee.

A new clock has been erected at the Town Hall, Newbury. The clock shows the time on four external dials 7ft. in diameter, composed of skeleton cast-iron frames, the centres of which are glazed with polished plate glass, ground on one side and made opaque. There is also a small index dial inside, by which to set the outside hands. The clock is built on a solid horizontal cast-iron bed-frame, which is planed. The escapement is the double three-legged gravity, by Sir E. Beckett, Q.C., with phosphor-bronze pallets. This is the most accurate kind of escapement made, and is similar in construction to the large clock in the Houses of Parliament. The pendulum is compensated, and has a cylindrical bob of 2cwt. All the work has been finished by Messrs. Potts and Sons, of Guildford-street, Leeds, who have lately erected the large clock at Lincoln Cathedral, which strikes the hours on the famous Big Tom, and the Cambridge Chimes on four smaller bells. The same firm are now erecting a large clock for Mr. Horace Davey, Q.C., M.P., for the new pier at Bournemouth, each of them being from the design and plans of Sir. E. Beckett. The raising of the tower was carried out by Mr. Samuel Elliott, of the Albert Steam Joinery works, under the direction of Mr. J. H. Money, architect, at a cost of £600.

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The Irish National Eye and Ear Infirmary at Dublin is being enlarged at a cost of about £2,000. Mr. G. C. Henderson is the architect, and Messrs. Stubbs and Brodigan, Amiens-street, Dublin, are the contractors.

THE BUILDING NEWS.

LONDON, FRIDAY, APRIL 29, 1881.

THE LATE MR. WILLIAM BURGES, A.R.A.

MANY of our readers have, by this time, heard with mournful surprise of the death of Mr. William Burges. Few, probably, beyond his most intimate friends knew of his illness save from a brief announcement which appeared in our own columns on the 15th instant, and in which it was stated that he was recovering. This, indeed, at the time was the fact. Mr. Burges had been seized with paralysis at Cardiff, on the 1st of April—the very day on which his last published communication, penned not very many hours before, appeared in this journal; he was brought from Cardiff to his own house at Kensington, and there recovered—or appeared to recover—from his attack uninterruptedly up to the morning of the day on which he died. On Wednesday, the 20th instant, his illness took a very unfavourable turn; his left lung and heart became successively paralysed, and he passed away peacefully and apparently painlessly a few minutes before midnight. He was buried on Wednesday last at the South Metropolitan Cemetery at Lower Norwood.

Mr. William Burges was the son of Mr. Alfred Burges, of Worthing, a well-known civil engineer of the firm of Walker and Burges, Great George-street, Westminster, who survives his son. The deceased was born on December 2nd, 1827, and entered King's College in 1839, where he remained for five years. At the age of 17 he entered the office of the eminent Gothic architect, Mr. Edward Blore, to whom he was articled in 1844. His first sketching tour was made in his native county, Sussex, in the following year, and his holidays during the following two years were employed in measuring old buildings in Lincolnshire and Norfolk. In 1849 he went to assist Sir Digby Wyatt, with whom he remained some time. In the same year Mr. Burges visited Normandy, and in 1850 continued his Continental studies in Belgium and Germany. Four years later he made a more extended stay abroad for the purpose of measuring and drawing the principal architectural remains and buildings in France and Italy. The strong impressions he acquired during this time of the suitability of French Mediæval work for modern uses, never lost its influence on the mind of Mr. Burges.

During the latter part of 1855 and the beginning of 1856, Mr. Burges, in conjunction with Mr. Henry Clutton, prepared his first design of importance in competition for the erection of Lille Cathedral. On the 13th March, 1856, the designs were publicly exhibited, and on the 13th of April the award was made by a jury presided over by M. de Contencin and composed of M. de Caumont, M. d'Ainstang, L'Abbe Martin (whose subsequent conduct was justly reprobated), and Herr Reichensperger—all well-known archæologists. Messrs. Questal and Denjoy and Mr. Edward Pugin were subsequently added to the jury for the sake of their professional assistance; but the last-named gentleman had, we believe, no voice in the verdict. The jury awarded the first prize of £240 to Messrs. Burges and Clutton, and the second prize of £160 to Mr. G. E. Street. Of the remaining 17 prizes, six were awarded to English architects—among whom was Mr. R. Popplewell Pullan, Mr. Burges' brother-in-law—four were gained by Frenchmen, four by Germans, and three by a Belgian, Swiss, and Luxembourgeois respectively. The result was as creditable to English art as what followed was discreditable to French honesty. In spite of the manly independence of the majority of the jury, who refused to yield to the pressure brought to bear upon them, Messrs. Burges and Clutton were paid their premium, and their design was handed over to l'Abbé Martin and M. Leroy, a local architect, to be mauled and patchworked into a French edifice. M. Leroy, in the competition, had gained a silver medal and the tenth place! In those days we were comparatively unaccustomed to the uncongenial task of criticising unfair competitions. We have had, unfortunately, many times since to rebuke similar instances of shameless and audacious dishonesty on the part of committees and other bodies charged with the management of architectural competitions; but we have never seen reason to change the opinion we expressed in the BUILDING NEWS of April 16, 1858, that "the Lille Competition will stand out in bold relief amid all the modern iniquities of its kind for its injustice, bad faith, and intolerance—a warning to English architects, and a monument of French pretensions to world-wide sympathy and unselfish love of art."

During the year 1857, Mr. Burges, still in partnership with Mr. Clutton, restored the beautiful chapter-house at Salisbury Cathedral, executing, at the same time, the elaborate decorations. In the same year he obtained the first premium for a design submitted in his own name for an English church at Constantinople. Two years later he designed the cathedral for Brisbane, the capital of the colony of Queensland, and in the same year (1859) Fleet Church, near Winchfield, Hants.

The restoration of Waltham Abbey and reconstruction of the east end of that notable church was commenced about this time, and later on the side chapel, long used as a village school, was recast and thrown in to the church under Mr. Burges' supervision. Cork Cathedral was designed in 1862, and was won in a public competition, in which 63 architects took part. The motto of Mr. Burges' design was "Non Mortuus sed Virescit," and he was awarded the first premium of £100, the second, of £50, being given to "Let Us Arise and Build" by Mr. T. N. Deane, of Dublin. Great exception was taken to the chosen design, and Mr. Burges replied, defending his design, urging that no one contemplated the erection of a cathedral, towers, spires, and all complete for the stipulated sum of £15,000. The building, although it has been erected for some years, is only now being completed. About this time Mr. Burges undertook the design for Lord Carington's house—another important work—and in 1864 he was engaged in designing and supervising the decorations of Worcester College Chapel, Oxford, including the stalls, the alabaster lectern, and other important additions. At this time Mr. Burges delivered a series of Cantor lectures before the Society of Arts on the Applied Arts, of a characteristically original and practical kind. These were afterwards republished in complete form, and are still well worthy of study. About this time Mr. Burges made his two well-known Mediæval or Dürer-like drawings of St. Simon Stylites, illustrating Tennyson's poem, and the Market-square Fountain design, both pictures being admirable examples of the periods of Art of which their author was so devoted a student. Photographs of these two drawings decorate the offices of several Gothic architects, and we reproduced the former, with Mr. Burges' leave, in 1874. Among other restorations, about which Mr. Burges was consulted, the important church of Stratford-on-Avon was reported upon, and careful drawings made, but the work was held over for want of funds. Last year the work was placed in the hands of Mr. Butterfield, a new Vicar having been appointed. Mr. Butterfield has, however, during the past few days, declined to go on with the work on account of the divided state of public feeling in the town with regard to the matter.

In 1865 Mr. Burges began the work at Cardiff Castle for the Marquis of Bute, and to this task he has devoted a very considerable portion of his time from that time up to the day of the commencement of his last illness, when, as already stated, he was engaged in supervising works at the castle. The new Tower, as our readers well know, is a most important erection having elaborate and beautiful decorations throughout. The work executed by Mr. Burges also includes a quadrangle of new stables, and a picturesque timber bridge in connection with the castle-grounds. The grand staircase, another very important feature in the castle, is also entirely from Mr. Burges' design; a water-colour view of this work was exhibited at the Royal Academy a year or two since. Mr. M'Connochie's house in Park-lane, Cardiff, should also be mentioned. This was the work selected by Viollet-le-Duc for illustration of an example of an English house in his well-known "Habitations Modernes," and where, much to Mr. Burges' dismay, the celebrated French architect has not hesitated to show construction and details which in reality do not exist in Mr. Burges' work. Going back for a moment to 1866, we must record the Art School at Bombay, designed by Mr. Burges, and among various minor works, a warehouse in Thames-street, justly admired as a much-needed proof of the possibility of combining mercantile requirements with architectural effect, and a group of model lodging-houses in Soho. In 1870 Mr. Burges designed his most successful church at Studley Royal, for the Marquis of Ripon, a work respecting which many legal difficulties ensued subsequently with the contractor, Mr. Charles Barry acting as referee. This work, we have heard it stated, was designed at a moment's notice on the spot, by Mr. Burges, single-handed, the T-square and drawing-board having been provided by Lady Ripon, so that the design might be made, as she said, by her architect, and under her influence.

The competition for the New Law Courts brought Mr. Burges into the field with a design so admirable, so original, and so striking, that even those who are now witnessing the gradual realisation of Professor Street's noble structure, must always cast back some thoughts of regret to Mr. Burges' Strand front, which was, beyond all question, the most artistically conceived design submitted. It has been urged—by ourselves at the time among others—that the circular towers were wanting in connection with the lower parts of the building; but this defect could easily have been removed, and we confess, as we turn over the pages of our back volumes wherein are fortunately preserved the splendid and vigorous conception destined never to become a reality, we cannot help a comparison of what Fleet-street and the Strand might have looked like with Mr. Burges' bridge across the spot where the old bar stood, and its present appearance, with that queer creation of an inferior mind—the griffin and his belongings—dominating and obstructing the roadway. It is, perhaps, an additional reason for our gratification at the preservation of Mr. Burges' great design in our own pages, that at South Kensington the original drawings are still packed in an out-of-the way corner in as neglected and dusty a condition as may well be conceived.

In 1872, Castle Coch, Glamorganshire, was re-constructed after the strict Mediæval fashion, and Trinity College, at Hartford,

Connecticut, a year or two later, was commenced from Mr. Burges' design. The college comprises a series of buildings, having two quads, with a large hall and chapel. The yet unfinished church of St. Faith, Stoke Newington, is among Mr. Burges' London buildings, and his additions to the furniture of St. Andrew's, Wells-street, should be named. In 1872, Mr. Burges designed a cathedral for Edinburgh, in competition with Sir Gilbert Scott and Mr. Street. Mr. Burges also built the Ripon Grammar School, and the new speech-room at Harrow, and one of his last-executed works was his own remarkable house at Melbury-road, Holland-park, Kensington, where he died. This building we have more than once described, and a view and a plan formed the first of our "Artists' Homes" series, published April 25, 1880. Mr. Burges was still continuing —and probably would have been for ever continuing—the decorations and furnishings, which were on the most thorough and complete scale. So particular was the deceased architect to have every article of furniture in household use in harmony with the rest, that different spoons and vessels were designed by him for various purposes, all in silver, set with jewels, and all differently emblematical of the purposes to which they were to be applied.

Of Mr. Burges's other great unexecuted work—his design for the decoration of St. Paul's Cathedral—we gave our opinion at the time of its exhibition. We did not then, nor do we now, think either his own reputation or that of the cathedral suffered by its rejection; but it is only fair to add that no one, except the artist himself, could have fully realised the appearance the design would have presented in execution, from the inch scale models exhibited in 1872. Some idea, indeed, may have been gained of what might have been, from the perspective views of his scheme which Mr. Burges afterwards exhibited at the Royal Academy; but we still question, especially when we recall expressions we have heard him use years ago with regard to the character and value of the cathedral which he essayed to decorate, whether Mr. Burges sympathised sufficiently with its architectural spirit and purpose to fit him for the task.

As an author, Mr. Burges's ability was of a high order. He was a frequent and always welcome contributor to these pages. Among his signed articles, to which only we can specially allude, we may mention his review of Planché's last work, the "Encyclopædia of Costume," and other reviews of books. He also rendered considerable assistance to Sir Gilbert Scott, in that architect's "Gleanings from Westminster Abbey," and was more recently engaged, in conjunction with Baron de Cosson, in the preparation of a critical catalogue of the collection of antique and Mediæval helmets, which was exhibited last year at the rooms of the Royal Archæological Institute, in the New Burlington. He had promised to read a paper at the Architectural Association a fortnight from to-day—May 13th—on "Queen Anne Architecture." This lecture would probably have been of an unusually interesting character, and had occupied the mind of its author for some time—indeed, not many weeks since, Mr. Burges pleaded its preparation as an excuse for not undertaking a paper for this journal on a somewhat similar subject. Mr. Burges died unmarried. Of his professional and private character, it is sufficient here to say that none who knew him failed to remark the thoroughness and single-mindedness which especially marked all he did and attempted. The Bishop of Cork's remarks, which we reproduce below, will be re-echoed by all who knew Mr. Burges. Few architects have been more respected and loved than he was by his pupils and assistants. Among the latter were Mr. William Emerson, Mr. E. C. Lee, Mr. Deane, jun., of Dublin; Mr. W. H. Lonsdale, and Mr. Chapel, his confidential assistant. Mr. Burges was elected an Associate of the Royal Academy on the 28th of February last—an honour as well deserved as it was, in our opinion, unduly delayed.

In consequence of the death of Mr. Burges, of London, the architect of St. Finn Barre's Cathedral, no chimes were rung out on Sunday last in Cork Cathedral. There was a large congregation at the afternoon service, at which the Lord Bishop delivered a brief address. Special hymns were sung in place of the usual Easter ones.

His lordship selected as his text the 9th chap. of the Book of Ecclesiastes, and the 10th verse—"Whatsoever thy hand findeth to do, do it with thy might; for there is no work, nor device, nor knowledge, nor wisdom in the grave whither thou goest." In the course of his sermon he said they were told in the New Testament that the life in this world was merely a preparation for the greater, the higher, the nobler life, which by Christ's grace, blessing, and mercy they were to live beyond the grave. Having referred to the death of Lord Beaconsfield, his lordship said another life had passed away during the past week which they were all, perhaps, most intimately connected with. It was to him, personally, a great shock to receive into his hand the message of the death of that celebrated architect, Mr. Burges. As they looked at the noble building they were reminded of that gifted man. It was a solemn thought that the creating mind was now at rest, that no more work would be done by the genius who, before one stone of that magnificent cathedral was laid, planned it all, and saw it in his own mind. Many a criticism was passed in the early stage of his work on the skill and power of the architect, and he (his lordship) found that of the number of those who from time to time came from all parts of the world, and visited that church—he found that those who knew most of architecture, those who have seen the works of great men in other lands, it was they who most admired the proportions and the beauty of that cathedral. He (his lordship) never met a professional man more thoroughly conscientious in his work, or more anxious about the detail of every part, whether of the structure or ornamentation of the building, a conscientiousness which led him also—although his work was expensive, and at times very expensive—to tell beforehand the cost, so that he might not lead unwittingly those who trusted in him into any expense greater than was expected. The cathedral shows unity in all its parts and all its designs as the result of the work of one mind, and now that he was gone it would stand as a monument to his memory.

As the congregation left the sacred building Dr. Marks played the "Dead March" on the organ.

The following designs and drawings, by Mr. Burges, have appeared in the Building News:—St. Finn Barre's Cathedral, Cork (gen. view), July 17, 1863 (longitudinal section), June 3, 1864 (tympanum over north door), April 17, 1874 (mosaics), Dec. 19, 1879, Jan. 30 and Feb. 20, 1880. Brisbane Cathedral, Queensland (interior), Dec. 28, 1860. Competitive design for St. Mary's Cathedral, Edinburgh (west elevation), Feb. 14 (north do. and section), March 14 (three sections), Feb. 21, 1873. New tower, Cardiff Castle, for the Marquis of Bute, Dec. 9, 1870. Competition design for New Law Courts (Strand front), April 18 and May 3, 1867. Trinity College, Hartford, Conn., April 17, 1874. Warehouse, 46, Upper Thames-street, Nov. 23, 1866. Model lodging-houses, St. Anne's-court, Soho, Jan. 11, 1867. Door at Chalons-sur-Marne and Girouette, formerly at Tournai, July 7, 1865. Window furniture at Hotel de Ville, Rouen, Oct. 28, 1870. Litany desk, St. Andrew's Church, Wells-street, and alabaster lectern and candelabrum at Worcester College, Oxford, March 6, 1868; cabinet, November 11, 1870; decanters and drinking cup in silver, and escritoir, April 17, 1874. "St. Simon Stylites"—a pen-and-ink drawing illustrating Tennyson's poem—April 17, 1874.

ARCHITECTURE AT THE ROYAL ACADEMY.—No. I.

TAKING the collection generally, and confining ourselves this week as usual to a mere list, we cannot but perceive that there is a paucity of good subjects. Mr. Street sends four drawings, and Mr. Waterhouse has done his best; but we miss works from the hands of either Mr. Pearson or Mr. Norman Shaw, and the late Mr. Burges, A.R.A., does not seem to have sent anything. Such names, too, as Arthur Blomfield, W. Emerson, J. P. Seddon, J. D. Sedding, T. Graham Jackson, or John Gibson are either not represented or but indifferently. Neither is Mr. Gilbert Scott there, nor is Mr. Collcutt, Mr. J. J. Stevenson, Mr. E. C. Lee, nor Mr. E. R. Robson; indeed, we believe that one or more of these architects have this year had their works refused.

Taking Mr. Street's exhibits first, his own two drawings are of course the best, especially the cross view of "Bristol Cathedral Nave" (1109). The "Duncombe Monument in York Minster" (1093) is perhaps less happy. The water-colour view (1101) of "Kingston Church, Dorset," hardly does Mr. Street justice, as the drawing is in some respects very faulty, especially in the lines of the chancel arch. No. 1057, "The English Church at Rome," is this architect's fourth work. Mr. Waterhouse has trusted entirely to his own brush, and in No. 1010 has given us one of the best designs he has ever made, the subject being the "Liverpool Pier Head Clock-Tower," to be erected in memory of Mr. C. Turner, M.P. His second work (No. 1043) illustrates "The Library at Eaton Hall, Cheshire," but we like the detail less. The third drawing by the same hand will attract most attention, because it shows Mr. Waterhouse using the Free Classic details or the much-abused "Queen Anne." The subject, too, is a new and important one, providing, as it does, a Central Institution of the City and Guilds of London Institute for the Advancement of Technical Education, to be erected in the Exhibition-road, Kensington. Messrs. Bodley and Garner have only two drawings, and these are in pen-and-ink. The more important of the two is a west view of "St. Michael's Church," now building at Camden Town, showing the tower with which this building is to be finished. The west window seems out of harmony with the rest of the design. No. 1078 shows their second work, The "Master's Lodge, University College, Oxford," recently built in an Elizabethan style. Mr. James Brooks, in the "New Stables in Brick-street, Park-lane" (1085), indulges in the style of the hour, Queen Anne. We like far better his "Church of St. Mary Caynham, near Ludlow" (1111). "The Mission Church at Lewisham," by the same architect, No. 1047, is also a characteristic interior. Mr. John O. Scott's best work is an exterior by his own pen, of his "Church at Burton-on-Trent" (1115). His "Lahore Cathedral" suffers from the elevations, by means of which the building is shown. Close by is a nicely-treated country mansion, clearly drawn in brown ink, called "Nether Court," at Hendon (1121), by Mr. Coutts Stone, well placed on a raised terrace, and showing careful study of old houses of the period chosen. Just to the left we have Mr. F. C. Penrose's "St. Paul's Choir Schools, E.C." The work has been built some years, and is well known. Mr. Somers Clarke has this year contributed two views of a house in his favourite brick style, and called the "Warren, Hayes Common, Kent." We like the entrance-view (1086) the better of the two. No. 1108, just above, by Messrs. Ware and Stokes, the "Church of the Sacred Heart," at Exeter, is a boldly-treated building, also illustrated by other views, 1015 and 1019. Mr. Alexander Graham's "New Front in Regent-street" for Howell and James, is hung too high for close inspection (1107), but the executed building is certainly a striking one. The "New Grammar School," at Wellingborough (1102) is well hung, as it deserves, but the same architect's "Bank at Stamford," is skyed so as to be beyond all chance of examination. Mr. J. T. Micklethwaite is represented by his "Church of St. Hilda," Leeds, but the drawing is hung so high that, like the one next to it—"St. Cuthbert's Church, Ushaw College" (1105), by Messrs. Dunn and Hansom—we are only

able, with the greatest difficulty, to examine it. The "Lewisham Sunday-schools of the Congregationalists" is by Mr. Geo. Sherrin. The "Raikes Memorial Church" (1092) we hardly like, but Mr. H. J. Green's restoration, or rather, rebuilding of the demolished Church of Wells-next-Sea, Norfolk, is very interesting, and so is the dashed-in sketch of "St. Nicholas Tower, Caen" (1047), by Mr. W. R. Lethaby. Messrs. Goldie and Child's drawings this year are hardly up to the mark. No. 1075, a "Residence for Baron de Casson," is the best, perhaps. Mr. John Douglas has a view of "Barron Court, near Chester." "Haileybury, Branksome Park, Bournemouth," by Mr. Basil Champneys (1071) should not have been skyed as it is. Mr. Sherrin's "Master's House at Weybridge" is also cruelly hung (next to the last mentioned), and so is Mr. Ernest George's single exhibit, "The Coffee Tavern and Hostelry at Newark-on-Trent" (1082). Mr. Roger Smith's "Hospital at Hampstead" deserved a better drawing than No. 1072, and the same building has already been exhibited in the Royal Academy. Mr. Somers Clarke, jun., exhibits a practical drawing (1069) of a Pulpit in St. Martin's Church, Brighton, with plans arranged complete. The most charming interior water-colour in the room is Mr. Haigh's delightful "View of Mr. Alfred Hudson's Church (1055) at Southsea." The style of the design is mixed in character, but bold and effective. "The New R. C. Church and Schools at Bromley," by Mr. E. Ingress Bell, deserve notice, and so does Mr. J. M. Brydon's "St. Peter's Hospital, Covent-garden." Messrs. Hadfield's "Central Entrance to the Sheffield Corn Exchange" shows a late-in-date arched way in very good style well carried out. Mr. F. Kempson sends his "Hereford County College," a work of considerable size; and Mr. West Neve has a drawing giving some small offices at Cranbrook, Kent. "The Staircase Hall, St. Cloud, Paris" (1044), by Mr. Theodore Howard, is Japanese-like and clever; and we like Mr. Bell's "House at Brighton." Mr. John Pettie's "House at Hampstead," by Messrs. Flockhart and Wallace, is a painter's house; and so is "Hove House, Chiswick" (1040), by Mr. Maurice B. Adams, a work we have lately illustrated. Mr. Chisholm has an important work in the "Post and Telegraph Offices, Bombay" (1029), and Mr. E. J. May has a "Vicarage at Turnham Green," which is unfortunately skyed. "The Ivory Door" (1012) is by Mr. G. A. Storey, A.R.A., and gives a detail about full size.

THE INSTITUTE OF PAINTERS IN WATER-COLOURS.

THE gallery of this society at 53, Pall Mall, opens with a strong display of landscape. Harry Johnson, C. Vacher, Harry Hine, the late F. J. Skill, J. Aumonier, E. M. Wimperis, J. W. Whymper, J. Mogford, J. Fahey, H. G. Hine, and T. Collier, are well represented, and their works exhibit as great a variety of characteristics. Mrs. W. Oliver's "Lake of Como" is an unpretending sketch, though skilful in the light which is reflected in the quiet lake; and among the smaller unpretending subjects, Harry Hine contributes several in his clear luminous style. "Old Eastbourne" is full of softened light and air, transparent and granulated in the tints. His "Durham" is almost Turneresque, so soft and aërial are the colours; and "A Misty Evening" is equally broad and full of atmosphere. "A Mill on the Ivel" (136) is remarkable for its light and air. Harry Johnson, another well-known artist in this gallery, in his "Twilight on the Stour," gives us a pleasing summer river scene, granulated in its texture of colour; and the same artist's "View of Narni, with Roman and Mediæval Bridges" (169), is a well-finished drawing of a sunny scene, picturesque in the masses of structure and hilly landscape. Charles Vacher sends no less than seven pictures, remarkable for their delicate colouring and calmness. His "View of Esa, between Nice and Monaco" (8), is a large and highly-finished scene, painted in soft warm balmy tones, so characteristic of his work, and at first sight suggesting a chromo-litho effect. The lofty Maritime Alps rising in the background, bathed by the water of the placid bay, and the aërial colouring, take us into a Southern clime, and it is this sunny geniality which to English picture admirers has a somewhat fascinating effect. The "View near the Church of Monte Sacro, Lake Orta," is another Italian landscape, glowing in warm tones of sunlight. Scenes on the Nile, especially No. 170 "Temple of Kom Ombos, Upper Egypt," are fine renderings, the roseate hue on the temple reflecting the moonlight, and the softened glow gives an air of sleepy stillness to the scene. The late F. J. Skill's "Bexhill, Sussex," Marian Chase's lovely basket of primroses (10), and the drawing of the roadside bank; her "Grapes and Apples," Mrs. W. Duffield's fine flower piece, depicting "Pelargoniums," are all pictures that will bear close scrutiny, and draw admiration for their finished execution. E. H. Fahey, known as a disciple of the Impressionist school, is the contributor of one of those simple but intensely feeling studies of juvenile life, which is a favourite theme with modern artists. The light-haired little girl seated in a green-stuffed arm-chair of our grandfathers is more remarkable as a study of colour. Less satisfactory as a study of features is H. B. Roberts' No. 22, a peasant girl in a garden with a bundle of freshly-picked rhubarb. J. Aumonier, in 24, also an artist of the Impressionist school, sends a large picture of "Chelsea from Battersea Park." The figures in the Embankment promenade are as truthful and as free from the faults of many pictures of popular subjects as the drawing and colour of the Chelsea Hospital and houses in the distance. The colours are worked in tempera, and a pleasing atmosphere and natural tone pervades the work. In contrast to Mr. Vacher's serene landscapes are the rugged, breezy commons and fresh-looking moors E. M. Wimperis loves to dwell on. "The Ford near Criccieth" (29), an open moor, grey in its tones and looming in the distance, is drawn with a breadth and vigour characteristic of this artist, who gives us besides other spirited sketches of open landscape as in the wild bleak view of "Estuary near Portmadoc," "On the Shore" (72), "Shore at Exmouth" (76), and sketches of common and moor (131 and 200). G. Clausen, in "Gaywood Almshouses, King's Lynn" (31), shows clever handling in blends of colour, sharp and defined lights and shadows, rather impressionistic in manner; and in a totally different vein must be mentioned the ideal figure-studies of the late Augustus Bouvier, an artist who has acquired distinction for his graceful figure compositions of an emblematic kind. In the present collection, "The Lamp Seller" (34), "Repose" (47), "Saltatrix" (54), "The Fountain" (101), "Psyche" (162), and the "Wood Nymph" (189), are each in its way, the dainty and fanciful creation of a refined imagination. The Greek feeling in the pose and drapery of the figures in the "Lamp Seller," the symbolised expression of the dancing girl in "Saltatrix," and the airy and zephyr-like movement and drapery of the girl on a swing in the "Wood Nymph," are characteristic of this artist's work. We cannot be blind, however, to a certain stiffness in the limbs, and a rather artificial treatment of colour pervades many of these studies. Guido R. Bach, a well-known member of the Institute, contributes, in 35, "A Pastoral Symphony," one of those masterly figure groups which charm as much by the freedom and truthful drawing as by the purity of colour and genuine sentiment. The subject is simple—an Italian boy musily lying on a rock, piping, with his little sister by his side. W. Small sends a pleasing study, "Low Tide," the girl's face is charmingly real and well drawn, but the foreshore is rather hard in manner. A cleverly-finished drawing is C. Green's "Behind Time," an old gentleman in red tail-coat and knee-breeches seated in the shady corner of a garden. The costume and colouring, recalling a generation ago, are both good. The president, Louis Haghe, in 52, is conspicuously represented by a crowded christening scene in St. George's Chapel, Windsor, representing the christening of H.R.H. Albert Prince of Wales, but we are inclined to think the picture does not add to the reputation of this veteran painter. The incident itself is probably due to commission; whether it be or not, a royal ceremonial pageant is always a failure, and the body pigment used gives the picture, spite of some good drawing of architectural detail, a flashy and rather stagey look.

Boldness of handling and some solid colouring are to be found in J. W. Whymper's "Timber Clearing" (56), and other drawings, and the study of a girl with long chestnut hair with a cat on her lap, in "Enid" (60), may be noticed as a pleasing portrait-subject, if not properly an "arrangement in red and brown." Less conventional and modern is Towneley Green's "Talking Him Over"—a prim, old-fashioned kitchen wherein an elderly man with top boots is reclining in a chair, and his young daughter behind him is using her tongue rather persuasively. His small pieces on the screen, "A Fruit Seller" (195), and "Spring Flowers," are also feeling studies of figures, simple and delicate, quiet in dress and colouring. John A. Houston, Edwin Hayes, R.H.A., send too skilful studies (73 and 74), and John Fulleylove, in his ideal landscape from a passage in Morris's "Earthly Paradise," "The Ring given to Venus," shows a number of rather commonplace figures of lovers seated and reposing in a garden, whose terraces descend to a deep blue bay with rising palaces on one side. The colouring is better than the drawing. Emily Farmer's "The Doubt" (88) and W. W. May's "Misty Mount St. Michael's" (89), are worth notice, the latter for its radiant atmosphere, and the former for the sweetness of expression in the face of the veiled damsel. As a study of colour, "The Latest Novel" (90), by T. W. Wilson, will be admired, though there is little in the incident told.

L. J. Wood sends three contributions in his usual style. "A Desecrated Church at Senlis, Ile de France" (83) is one of his best small sketches, broader in handling than many by him, and the gray tone of the rich front is not over-laboured by the finical dotting which rather destroys the equally fine subjects of "Abbeville" (117) and the view at "Coblentz." Decision and purity of colour mark all three works.

A few imaginative subjects may be noticed. We may draw the attention to John Absolon's "Death of Juliet" (111), a drawing of much dramatic power, skilful in the glare of light thrown on the two figures; and especially to Henry J. Stock's "Death of Huldbrand (Undine)" (121), a work of skill both in composition and depth of tone. His "Margaret and the Evil Spirit" (142) is a powerful conception. The heroine of Göthe's "Faust" is seated in a dark cell, the light streaming through the window upon her. She is at her devotions, and behind her is Mephistopheles tempting. The composition, drawing, and execution are all clever, and the gloomy surroundings, depth of shade, and

treatment take it out of the commonplace. The study of "Gil Blas" (135), by John Absolon (135), is another interesting study by that artist, and J. D. Linton's "Amy Robsart" (152) is worthy of that gentleman's skill as a delineator of figures and costume. We may glance, too, at a pleasing landscape (126), by John Mogford, Mrs. E. Murray's "An Old Palace in Venice" (113), a charmingly clever drawing in the detail of the marble plinth, the transparent colouring and dexterous manipulation; Edward Hargitt's fresh heathery scene, "'Mang the Blooming Heather," Marian Chase's "Chrysanthemums," Lionel P. Smythe's "Carol Singers," a feeling and highly-finished drawing; "On the Lledwr, N. Wales," by J. Syer; Edward J. Gregory's skilfully-finished picture "Last Touches" (144), refined in colour and accessories; J. Collier's "Carting Gravel," H. G. Hine's clever, fresh and sunny landscapes (145 and 155); C. Cattermole's "Plea for Mercy" (165), and the "Page's Jest" (174), and a few others by J. H. Mole (179), J. Tenniel (178), Mary L. Gow (185). The screens are well filled with some sweetly-drawn studies. G. G. Kilburne's piece (209); J. Mogford's "Au Clair de la Lune" (206), and the clever drawings of Towneley Green, and Fulleylove are works of merit. Lady Lindsay sends a few choice specimens of her studies in still-life, &c., and the flower gems of Mrs. Duffield and Marian Chase cannot be passed over. There is, as usual, much of a slipshod kind on the walls, and the committee of selection will do well to exercise yearly greater discrimination.

In connection with the Institute, we may mention the proposal to erect in Piccadilly, on a site nearly opposite the Royal Academy, new Art Galleries, a public hall, restaurant, and shops, and the intention of the Institute of Painters to assist in the formation of the company, and to hold their annual exhibition in the new galleries. It is also intended by the Institute to throw open these exhibitions to all painters in water colours who are not members, but subject to selection on the principle of the Royal Academy; and arrangements will also be made for an exhibition of oil-paintings in the winter, under the management of distinguished artists. These galleries, we find, will also be available for scientific and art gatherings, and will have a large hall on the ground-floor at the back, suited for concerts, balls, and banquets; while above, the whole area will be devoted to the picture-galleries, so arranged that they can be use *en suite* or separately. The plans and design have been prepared by Mr. C. Henderson, architect, of Finsbury Pavement, and the elevation represents shops in front, with a central and two side entrances to galleries and hall, two mezzanine stories, and the art galleries at the top. The design is French Renaissance in style, and the estimated cost of building is £30,000.

HEAT IN ITS RELATIONS TO BUILDING APPLIANCES.

THE remarkable phenomenon which we call heat plays too important a part in the economy of nature to allow of its being overlooked by those who are engaged in the operations of building, since the strength, form, and utility of many substances are greatly affected by variations of temperature. In the present article we propose to consider some of the effects which these changes of temperature produce upon building materials and building operations generally, so far as they have been determined by careful and well authenticated experiments and investigations.

The first thing we have to consider is the method of measuring with accuracy the changes which occur in the temperature of a body. This is done for moderate degrees of heat by means of an instrument called a thermometer, in which the expansion or contraction of a fluid such as alcohol or mercury indicates an increase or diminution in the amount of heat which a body contains. In this country we have two standards in use for measuring variations of temperature, one of which, called the Fahrenheit scale, is in common use for every-day purposes, and has the temperature of melting ice, commonly called the freezing point of water, indicated by the arbitrary number 32°, that of boiling water being 212° when the barometer stands at 30in., the space between these two points being divided into 180 equal divisions called degrees. The other system, called the centigrade scale, which is now universally used for scientific purposes, takes the melting point of ice as the zero or 0°, and the boiling point of water as 100°, the space between them being divided into 100 equal parts or degrees. Thermometers made of glass, and containing either alcohol or mercury, are incapable of being employed for very high temperatures, since the former boils at 78° Centigrade, and the latter at 320°, so that we must use some other means for measuring higher temperatures than these; the same standard scales are, however, adopted, whatever the temperature may be. If we put F for any number of degrees on the Fahrenheit scale, and C for any number on the centigrade, we can find by the following equations the number of degrees Fahrenheit answering to any given number of Centigrade degrees, or of Centigrade corresponding to any number of degrees Fahrenheit.

$$F = \frac{9}{5}C + 32, \qquad C = \frac{5}{9}(F - 32)$$

The table given below will also show the relation between the two scales for some of the more important temperatures; but throughout the present article we shall always use the Centigrade scale in speaking of temperature, unless otherwise stated.

Fahr.	Cent.	
0°	−17·78°	
32	0	Ice melts.
39·2	4	Maximum density of water.
61	16	
172	78	Alcohol boils.
212	100	Water boils.
455	235	Tin melts.
608	320	Mercury boils.
633	334	Lead melts.
773	412	Zinc melts.
1652	900	Strong red heat.
1994	1090	Copper melts.
2372	1300	White heat.
2732	1500	Cast-iron melts.
3092	1700	Steel melts.
3452	1900	Wrought iron melts.

One of the most important phenomena to the builder is the effect produced upon water by change of temperature, since this is a substance that enters largely into many kinds of building materials. It is an *almost* universal law that bodies expand in volume as their temperature rises, and contract as it falls; and we find that water follows this law between the temperatures of 4° and 100°, so that the same weight of water which at 4° occupies exactly 1 cubic foot of space, or 1,728 cubic inches, will be found at 50° to occupy 1,749 cubic inches, and at 100° a space of 1,803in., the *rate* of expansion increasing with the rise of temperature. The contraction is also in an inverse ratio as the temperature falls, 1,728 cubic inches of water at 100° occupying only 1,656 inches at 4°. Here, however, the contraction ceases, for we find that as the temperature falls below 4° the water expands as much for each degree below as it did for each degree above 4°; consequently the temperature 4° is that at which water has its greatest density, and 1,728 cubic inches at 4° occupy 1,728¼ at 0° or zero of Centigrade scale. At this point, however, a sudden change occurs, the liquid water becoming solid ice, and at the same time expanding instantaneously about 10 per cent. in bulk, so that 1,728 cubic inches of water at 0° are converted into 1,904 cubic inches of ice at the same temperature. The force developed by this expansion at the moment of congelation is the same as would be required to compress a given quantity of water by 1-11th of its bulk. Now the pressure of 15lb. on a square inch of water is found to produce a compression of 1-20,000th of its bulk, therefore the force per square inch required to compress it by 1-11th must be equal to

$$\frac{20{,}000}{11} \times 15, \text{ or } 27{,}273\text{lb},$$

or about 12 tons for every square inch of surface. This, then, may be taken as the actual force exerted by the congelation of water, and as it takes place very suddenly, the effect produced by converting water in a closed vessel will resemble the blow of a hammer of 12 tons weight upon every square inch, so that we cease to wonder at the bursting of the strongest pipes if full of water when congelation takes place. Newly quarried blocks of stone, if exposed to frost, will be split to pieces by the freezing of the moisture which they contain. Blocks of slate are also rendered more fissile by the action of frost, and can be readily split into thin layers, but should a thaw follow the frost it will be found very difficult to split them until a new frost sets in and restores the faculty of splitting. If, however, the blocks of slate are exposed to a succession of frost and thaws, they become quite unsplittable. Mortar or cement joints which have been newly made, when a frost comes will be seriously affected by the freezing of the water they contain, and will fall to pieces.

The expansion and contraction of solid metals from an increase or diminution of their temperature is much less in quantity than in the case of liquids, being scarcely perceptible for moderate degrees of temperature. In some metals the change which takes place is much greater than in others, and is always more in proportion at high than at low temperatures; and if we increase the density of a metal by hammering or rolling, we find that its rate of expansion is also increased. The linear expansion of a rod of zinc 100ft. long, if heated from 0° to 100°, is 3·576in.; that of a rod of lead 100ft. long is 3·384in.; that of a copper rod 100ft. long is 2·064in.; while a bar of wrought iron 100ft. long expands only 1·464in., but if drawn into wire a 100ft. will expand 1·728in., and a bar of cast iron 100ft. long is increased by 1·356in.; one of untempered steel by 1·296in., but a bar of tempered steel is increased by 1·488in. A rod of glass expands about half as much as one of copper. The cubical or volumetric expansion of solids is in all cases three times the linear expansion. The force of expansion being equal to that necessary to compress the body to its original dimensions, we are able to calculate the thrust which a bar of iron exerts when it is heated through 100°, and find that it amounts to 15 tons in a bar 1 inch square, and therefore, to a proportionally greater force in a larger mass. From this we see how necessary it is that a certain amount of play should be always given to ironwork when employed in large quantities in a building, especially where it is exposed to considerable variations of temperatures, as in roofs, bridges, railway structures, &c., otherwise the supports may easily be overturned by the enormous force developed in the expansion and contraction of the metal.

When a bar of cast-iron has been exposed continually for several days to a temperature above 900°, it will be found that when allowed to cool again it has not contracted to its former length, but that it has become

permanently elongated, so that if its original length was 100 inches, it will now be found to have increased to about 101 inches.

Water is not the only liquid that expands on becoming solid, for we find that molten iron has the same peculiarity, and this enables us to cast it in moulds of the most delicate patterns, as in solidifying it expands and fills up every part of the mould. If we put a ball of solid iron, at any ordinary temperature, into a mass of the molten metal, we shall find that at first it will sink to the bottom from its greater density, but that as it becomes heated it will get lighter in specific gravity, and will eventually rise and float on the surface as soon as it has reached its plastic state, or about red-heat, showing that the solid metal is of less density than the liquid iron. As soon, however, as the iron has solidified it begins to contract with the lowering of its temperature, and this contraction has to be allowed for in making the patterns for castings. Thus in passing from the temperature of about 1500°, at which it melts or solidifies from the molten state, to the average temperature of the air, it is found that iron contracts in length from 1 to 2 per cent., according to the quality of the metal.

From experiments which have been made in order to test the resistance to strains of iron at various temperatures, it appears that cast-iron beams attain their maximum strength at the temperature of melting ice, or 0° of the Centigrade scale; and that if their temperature is reduced to — 9°, their strength is also reduced by about one-eighth. On the other hand, if a cast-iron beam is heated to 100°, or the temperature of boiling water, the strength is reduced by about one-eighth; but if heated to redness, or about 900°, it loses one-third of the strength it had at 0°. This result shows how little reliance is to be placed upon this metal as a material for fire-proof building, as in case of a fire occurring which would heat the metal above redness, the iron beams would give way under a load that they would easily support when cold.

Wrought-iron plates appear to attain their greatest tensile strength at the ordinary temperature, or about 16°, and to lose one-fortieth of their strength if the temperature is reduced to – 18°, or the zero of the Fahrenheit scale. If heated to 100°, the strength of a wrought-iron plate is reduced by about one-ninth, and by one-fourth when red-heat is reached. Wrought-iron rods, however, would seem to be strongest at the temperature of 160°, losing one-fourth of their tensile strength when it is reduced to 16°, whilst at red-heat they lose above half of their strength. The resistance of some kinds of iron to strains is, however, affected in a much less degree by changes of temperature than other kinds; but in all the loss of strength is very considerable, as they approach the temperature of red-heat, which may perhaps be partly accounted for by the density being reduced, since that is generally proportional to the cohesive force. When wrought iron is heated to about 1,300° or white heat, it becomes so soft that two pieces of it can be welded together by hammering, and the welded joint is then as strong as the metal itself when it becomes cold.

Steel is a variety of iron which owes most of its valuable qualities to the action of heat. When a piece of soft steel is heated to redness and then suddenly cooled by plunging it in cold water, it becomes very hard and possesses great power of resistance to a crushing force, but is at the same time too brittle for ordinary use, as it will fracture at the slightest blow; but on being reheated to redness and allowed to cool slowly it regains its original softness and malleability. If the metal is now reheated to a temperature much below redness and then cooled suddenly, it becomes softened to a degree inversely proportional to the temperature to which it has been raised, so that by carefully regulating this temperature we can give to steel any required amount of hardness or softness, this process being called "tempering" the steel. By hardening steel within certain limits of temperature we increase its tenacity, but if heated to bright redness the tenacity is reduced. The process of hardening steel has also the effect of diminishing its specific gravity or density, since the material becomes permanently expanded in its dimensions; thus we find that while the specific gravity of unhardened steel is 7·9288, that of hardened steel at 11° is 7·6578. If, however, the metal is remelted, the specific gravity of the unhardened steel is 8·0923, which is reduced by hardening to 7·7647. The dilatation by increase of temperature is also greater in tempered than in untempered steel.

We are generally apt to regard iron and steel as good conductors of heat, which undoubtedly they are as compared with non-metallic substances, their conductivity being about twenty times that of hard sandstone; but as compared with other metals, their conductivity is low, being only one-seventh that of copper and one-tenth that of silver. Their power of conducting heat is also less in proportion at high than at low temperatures.

Lead is a metal which has a very low fusing point as compared with iron, becoming liquid at 334°, and having a less density in the molten than in the solid condition, so that a piece of solid lead will not float in the molten metal, as happens in the case of iron. The expansion and contraction of lead by changes of temperature are considerable, for in being heated through 50° of temperature a sheet of lead 10ft. long will expand one-sixth of an inch in length, and will contract by the same amount in cooling, the force developed in this change of length being equal to 1,000lb. per square inch of section; hence arises the necessity of allowing it to have free play when laid as a covering of roofs, which are often exposed to quite as great a variation of temperature as that mentioned above.

The metal zinc has its character greatly modified by variations of temperature, an ingot of zinc being very brittle at ordinary temperatures, while if heated to 200° its brittleness is increased to such a degree that it may easily be reduced to powder. Between the temperatures of 100° and 150° it is, however, capable of being rolled into thin sheets or drawn out into fine wire. The degree of malleability which zinc possesses depends also on the temperature to which it has been raised when in the molten state, the metal being more malleable if cast at a temperature very little above 412°, its fusing point, than when it has been heated to a higher degree. The effect upon zinc of rolling it is to harden the metal, and in order to render sheet-zinc available for building purposes, it becomes necessary to have it annealed at a low temperature; for if it is heated to a temperature at all near that at which it melts, it will become brittle again. Zinc that has been cast at a temperature only just above the fusing point, and then cooled rapidly, is found to have a specific gravity of 7·178; but if cooled slowly it is less dense, and has a specific gravity of 7·145. A different result is, however, obtained if the metal has been heated to redness before casting, its specific gravity when cooled rapidly being in that case only 7·109, or, if cooled slowly, it is 7·12. Sheet-zinc expands and contracts by about the same amount as lead does for rise and fall of temperature; consequently, the same precautions must be taken to allow it free play when used as a covering for roofs.

The effects produced by heat upon wood are very different from those produced upon metals, as might be expected from its being an organic substance. When newly-cut or unseasoned wood is exposed to a moderate amount of dry heat its dimensions are found to contract, owing to the escape of some of the moisture which it contains in its natural state. At the same time, its power of resistance to strains is greatly increased after being kept for a considerable period in a dry and warm chamber. Thus, for example, we find that specimens of red deal have their crushing strength increased from 5,748lb. to 6,586lb. per square inch; of white deal from 6,780lb. to 7,293lb.; of Quebec oak from 4,230lb. to 5,982lb.; of English oak, from 6,484lb. to 10,058lb.; of red pine, from 5,395lb. to 7,518lb.; and of walnut, from 6,063lb. to 7,227lb. The process of boiling or steaming timber for the purpose of bending it does not appear to affect its strength in any material degree, provided it is only continued for a few hours; but if kept up for a long period the wood loses much of its resisting power. On the other hand, if timber is exposed for a long time to a high degree of dry heat, its strength is greatly diminished, and it becomes very brittle—a certain amount of moisture being essential to its strength.

When clay is burnt into bricks the effects produced by different degrees of heat are very conspicuous, the bricks which are nearest the fire being generally over-burnt and clinkered so as to render them unfit for building purposes, whilst those most remote from the fire are often insufficiently burnt, and are called place-bricks, from their being too soft to be used for outside walls, as they crumble when exposed to weather, and do not possess sufficient strength to stand any great crushing load.

When rays of heat fall upon clear glass one portion of them is reflected from its surface, another portion is absorbed by the material, and its temperature is thereby raised, while the greater part of the incident rays passes through the glass to the other side. The proportion of the transmitted rays depends somewhat on the thickness of the glass, since plate-glass ¼in. thick transmits 60 per cent. of the incident rays, while glass 1-16in. thick transmits 70 per cent. of them. About 10 per cent. of the incident rays are reflected from the surface of glass in the same manner, and according to the same law as those of light are reflected, and consequently about 30 per cent. are absorbed or dispersed by glass ¼in. thick, and 20 per cent. by glass 1-16 thick. Although the expansion of glass when heated is very small in quantity, yet it is sufficient sometimes to produce fracture in large sheets if too tightly fitted into frames formed of unyielding material. Thus a sheet of glass 10ft. long, will expand 1-10in. in length if raised through 100° of temperature, so that if fixed firmly in iron frames, which also expand when heated, it follows that fracture must necessarily ensue, especially where the glass is very thick, and will not readily bend. The low conducting power of glass also often causes the fracture of thick plates, for if they are heated to a considerable degree, and are then suddenly cooled on one side, the unequal shrinkage will produce a crack in the glass. The brittleness of glass can be much reduced by carefully annealing it, which is done by cooling it very slowly from a high temperature; plunging in boiling water or oil, and allowing it to cool gradually, adds much to the toughness of glass.

The absorbent power which materials possess for rays of heat differs widely in various substances, and depends a good deal on the nature of the surface exposed. If a surface is coated with lampblack, or with white-lead, the whole of the heat rays are absorbed, which causes the temperature of the body to rise rapidly, and the heat is then given off again by radiation, so that it is not advisable to use these materials on por-

tions of a building much exposed to the sun's rays. Metallic surfaces, such as those of iron, zinc, or lead, absorb only 13 per cent. of the incident rays of heat, and consequently do not become very rapidly heated by exposure to the sun or any hot body. Bright zinc reflects 80 per cent. of the incident rays, iron 75 per cent., and lead 56 per cent.; the difference between these quantities of heat reflected and the amount absorbed being dispersed or reflected in an irregular manner. Dark-coloured slates absorb much of the heat which fall upon them, which renders a room immediately under a slated roof very hot in summer; it is found that a coating of whitewash laid on the outside of the slates reduces very much their absorbent power, although a coating of white-lead paint would have, as we have noticed above, the opposite effect of increasing the absorption of heat.

In the construction of furnace chimneys it is of great importance to use such materials as are bad conductors of heat, so that the draught of the flue shall not be reduced by the lowering of the temperature through the escape of heat to the outside. A chimney built of stone will lose only one-twentieth of the heat that an iron flue would lose, since stone is a bad conductor as compared with metal, and one built of brick, which has still less conductivity than stone, will lose less heat in proportion. A great loss of heat, however, is occasioned when newly-built chimneys of stone or brick are used before being thoroughly dried, from the quantity of moisture they contain, the evaporation of which absorbs a large quantity of heat, which becomes latent in converting it into vapour. If a material is used which is pervious to rain, there will always be a difficulty in keeping up the draught of the flue, owing to the same cause, which renders a double casing desirable in such structures.

ROYAL ACADEMY LECTURES ON ARCHITECTURE.*

THIRTEENTH-CENTURY ARCHITECTURE—ENGLAND.

My concluding lecture is to be devoted to our own national architecture in one of its very best periods. No educated Englishman can be otherwise than proud when he thinks of the work his countrymen did all over England at this time. It was in almost all respects a truly national work, since its developments were distinct from and unlike those of all other countries—and, I think, little, if at all, inferior to the very best of them. Just as in dealing with Italy and France, we shall find it necessary to review shortly the state of architecture in England before the thirteenth century, and the changes consequent on the invention of the pointed arch. You know, probably, that we have in this country a number of buildings (churches) in various parts of England which have such distinct and marked characteristics that they perfectly admit of exact classification, and are in almost every particular unlike any of those which we know to have been built since the Norman Conquest. Their plans, with the one exception of the church at Brixworth, have square ends, not apsidal. Brixworth is probably a Roman work, and has all the evidences in plan and elevation that might be looked for in such a case, and is not really, therefore, an exception to the rule. These churches generally have masonry with long and short quoins alternately at the angles. Their walls have narrow pilaster-strips at intervals. Their doorways are generally enclosed with a narrow projecting line of stone, which rises from the ground and encloses the whole archway. Their towers are generally lofty, and have belfry windows divided by rude baluster-shafts; but where, as at Earl's Barton and Barton-on-Humber, the towers are enriched, it is with a system of arcading or panelling all over the walls, which is like that which I have described to you as existing at Ancona and elsewhere in Southern Italy—a system of unmeaning decorative stonework clapped on against the face of the walls, with no reference of any sort to their construction. I show you side by side a drawing of the arcading on Barton-on-Humber church, and on the front of Sta. Maria, Ancona; and you will see at once that the similarity in the system of decoration is so exact as to deserve special notice. In the same way, I have made two parallel elevations of a window from St. Mary Bishophill Junior, at York, and from the Cathedral of Ravello, near Amalfi. You will see here, again, that the elements of the design are all but identical. At the same time, it is to be observed that in the whole of these buildings there is hardly a trace of distinctly Roman influence on the design. The transept arches of Britford Church, near Salisbury, may perhaps be excepted, though even here, in combination with a singularly good and very perfect decorative panelled arch in stone and tile, the arches have the narrow outside stone border which I have learnt to regard as one of the most distinct marks of Saracenic architecture in the South of Europe, as it is one of the pre-Norman architecture of England. One thing at least is clear—viz., that English art at this time owed nothing, or next to nothing, to the Romans. At the same time, Ireland was rich in saints and in churches, and had the most intimate connection with the British Church before the coming of St. Augustine from Rome. And in Ireland, as in England, the churches were small, generally divided into two nearly equal parts, and always finished with square rather than apsidal terminations. In Scotland, under the same influence, we see the same effects, with the solitary exception of the circular church at Orphir, in Orkney, where the special circumstances of the case account for the variation.

Before the Norman Conquest England was, therefore, provided with churches which had, so far as we can see now, few marks of any sort of connection in style with those of France or Germany. At the time of the invasion, you know, from what I have already told you, that in almost all parts of France the apsidal east end was all but universally adopted; and what happens after the Conquest is equally significant and interesting. The Normans came over and evidently, as all conquering people do, brought their art and their architects with them. Then our English monasteries had a most intimate connection with French monasteries and nothing is more common than to find a monk sent from Cluny or some other great French convent to become head of an English house, such as Fountains Abbey, or others of almost equal importance. Each of these men, too, brought the latest fashions, and as far as the English prejudices would allow, imported them in some degree into his new work. In no respect is this more evident than in the substitution by the Norman builders of apsidal east ends for the original English square ones. The examples in which either these apses remain in part or in whole, or in which the foundations have been discovered, are the following among our cathedral churches: *Canterbury*, an apse with a circular chapel at the east end, built or rather begun on very much the same lines as Sens Cathedral by a French architect, William of Sens; *Winchester*, an apse with an aisle and chapels round it; the cathedral at *York*, built after the Conquest by its first Norman prelate, Thomas, had no doubt three or even five Eastern apses, a fragment of the wall of one of these under the transept being still *in situ*; *Lincoln* not only had three apses built by its first Norman bishop, Remigius, but, as far as can be made out from the small remains below the stalls and pavement, a second apse erected by St. Hugh, of Avalon, between 1186 and 1200, as well as the still remaining apsidal chapels to the eastern transepts; *Peterborough* had an apse and probably aisles finished in the same way; *Gloucester*, an apse with an aisle round it, three apsidal chapels, and one to each transept, the whole following exactly on the lines of Notre Dame du Port, Clermont-Ferrand, and the numerous similar French chevets; *Worcester*, an apse with an aisle round it, and doubtless chapels; *Norwich*, an apse with surrounding aisle and chapels, and two to the transepts, on the same lines as Canterbury; *Durham*, chapter-house apsidal, and choir in all probability so also; *Chester*, a short apsidal choir. With the exception of Canterbury, almost every one of these cathedrals has had its eastern end greatly greatly modified or wholly altered in the thirteenth and following centuries; and everywhere with the rarest exceptions, the later architects returned to what was the old and well-loved shape of the eastern limb of the cross before the Norman invasion. The apsidal termination to a church in England is, in fact, a distinct mark of foreign influence, and the universal objection to the form—for it is nothing short of this—on the part of the English at subsequent periods is, I believe, entirely due to the reviving national liking for what was consecrated in men's minds as their own national form. This was a perfectly natural thing if you consider for an instant the state of affairs. After the Conquest it is hardly too much to say that every bishopric and every abbey had forthwith imposed on it a French or Norman bishop or abbot. These, together with the foreign laymen entrusted with local commands, were the officers who were to keep the country in due order, and to take care that the Norman supremacy was not disturbed. Many of the bishops and abbots could not speak English. Everywhere they found the churches I have referred to existing. Usually these were insignificant, or, at any rate, not magnificent buildings. They had wooden roofs and ceilings. Sometimes they were thatched, sometimes built wholly of timber, and sometimes of wicker-work—as in the famous case of the chapel which stood on or close to the site now occupied by St. Joseph's Chapel at Glastonbury—which was a structure of twisted rods or hurdles, covered in the seventh century by Paulinus, archbishop of York, with boards on which he laid "lead from the top to the bottom."

The foreign bishops naturally introduced foreign architecture and foreign architects. Their churches had nothing whatever to do with those which had existed before, for these were a local development from, though with but little evidence of likeness to, the Roman buildings which had been scattered throughout the country during the Roman occupation, or else rude native copies of the basilicas which the British bishops had learnt to admire and venerate in their visits to Rome. The new churches were, in fact, almost complete repetitions of the churches which had come to be built in Normandy as the result of the long train of development in French architecture which had culminated in the art of the eleventh century.

In course of time the English began again to assert themselves. English bishops, English abbots, were appointed in place of foreigners, and with them English art made its first real mark in our country. Jocelin, bishop of Wells, and founder of the cathedral, and Hugh, the second bishop of the name, of Lincoln, were Englishmen and brothers, and commonly called Jocelin of Wells and Hugh of Wells after their birthplace. And it was at the end of the twelfth century, when Englishmen were again asserting themselves in their own country, that the invention of the pointed arch enabled them to throw off the architectural yoke of the Normans, and develop a style for themselves, one of the features of which was, in regard to the ground plan, a return to our own national form of square-ended church.

Whether I am right or not in my theory, the fact remains that with one grand exception, the whole of the great English churches of the thirteenth century were square-ended. This exception is, of course, Westminster Abbey. Here the evidence of the building itself seems to be complete that the king had resolved to build a church after the model of the great French churches, but employed an English architect to plan it, and he made his plan on lines which are distinct and different from those of any French church. Nothing is a more interesting subject for study than the adaptation of a foreign plan and design by an able Englishman devoted to his national art, but it is somewhat outside my subject to-night. All of us are proud of our beautiful minster; we all feel it is no dry repetition or copy of another building; but, at the same time, it is impossible to regard it as being a fair example of a purely English church. Some years ago, I believe that I proved to demonstration that the architect of Westminster built also, and at the same time, the beautiful church at Stone, in Kent. The arcades round the eastern portion of both churches, the detail of much of the ornament, and the character of

* By Professor G. E. Street, R.A., F.S.A. Sixth and concluding lecture of the course, delivered on Thursday, March 3.

the window tracery and of the clustered columns in the two churches, are to a large extent identical, and where they are not absolutely so, they are so nearly alike as to make it evident that they were designed by the same hand. The proportions of both churches are similarly designed on the equilateral triangle, and the materials used are the same. The interest of this smaller work is great, therefore, as showing that directly the architect of Westminster was free to do as he liked, he built as an Englishman of the strictest kind, with no evidence in any part of his work of foreign leanings, and notably with a square east end in place of his Westminster apse.

The gradual growth of an English church is nowhere to be studied better than at Canterbury, where we are so fortunate as to have the account of the building of the cathedral by two monks, Edmer and Gervase, one of whom described the history of the church in 1130, and the other its burning and rebuilding at the end of the century, and this last saw the work absolutely in progress very much as we now have it. What happened at Canterbury gives us in a clear way an insight into what happened, much in the same way, in other dioceses. The Saxon church was probably one built, as far as outline is concerned, to a considerable extent on the lines of the Basilica of St. Peter's. St. Augustine and his successors were so distinctly identified with Rome that it would have been certain in any case that this would be so, had not Edmer's account led to the same conclusion. Archbishop Lanfranc took this church down and rebuilt it on a larger scale, finishing his work in 1130. His plan included a nave and aisles, transepts with eastern apsidal chapels, and a short choir, probably finished with three eastern apses. This church was enlarged by another archbishop in order to satisfy the desire for a large choir, which involved in so many cases the destruction of our own cathedral choirs; and in 1174 the enlarged church had arrived almost at the dimensions which it still has. It had a long choir, an eastern transept, in addition to the ordinary central transept, a great apse with an aisle round it, and apsidal chapels on either side of the main apse, and probably to the east of it also. The columns and arches were low, the aisles were vaulted, but the central portion was roofed with a wooden roof ceiled on the under side. This was again burnt in 1174, and the archbishop forthwith called in a French architect, William of Sens, who retained but increased the height of the columns and arches, and covered the whole choir with a stone vault above a triforium and clerestory. His successor, William the Englishman, finished the church by the erection of a second apsidal choir, with an aisle round it which was built to receive the shrine of St. Thomas à Becket, and east of this a circular chapel, or corona, as it is called. The whole scheme is now one of the most beautiful in Europe. The gradual narrowing of the choir before the junction of the eastern apse with the apse of Ernulf or Anselm is the result of an ingenious utilisation of the older church foundations still existing in the crypt. The same economical considerations affected the builders of many of the enlarged choirs of our cathedrals, as, *e.g.*, Winchester and Gloucester, where the existence of a semicircular crypt compelled the later architect, who could not afford to destroy the whole of the foundations, to adopt some ingenious system of plan to enable himself to combine the two. At the Abbey of St. Denis, near Paris, precisely the same necessity compelled the architect to make the first bay of his choir incline considerably on plan. It is one of the charms of Gothic buildings that wherever such a necessity existed it was honestly met, as a matter of course, by some arrangement which, whilst it explained the fact on its face to every one, at the same time added to the picturesqueness and beauty of the design.

So great a work as this at Canterbury was, so magnificent in its results, would, it might have been supposed, have been followed, if not throughout the whole country, at least in the county and diocese. Strange to say, it had no followers, and seems to have produced no effect. In most dioceses we find the most general and complete architectural influence exercised by the Mother Church. The men who built this either directed or inspired all the work in the district; so that variations in design which were at first merely personal,—the fancies of some one able man,—came in course of time to be local peculiarities in which the original personal influence is no longer seen. It is difficult to account for this contrary state of affairs in the case of Canterbury. But probably the insular pride or prejudice,—call it which you will,—of the English resented the introduction of a style of building which had no connection with and never reminded them of the ancient traditional form of the English Church. It is clear that the impetus given after the Norman invasion to the adoption of plans copied from or founded on the Norman churches soon ceased to produce effect. The great churches were most of them rebuilt in the new fashion, but not the less was there a deep dislike to the change, and a steady preference for the plan which was gradually felt to be more distinctly connected with the old times before the invasion and conquest. I am disposed also to lay some stress in this matter on the desire of Northern nations to secure the exact orientation not only of their churches, but of their altars also. The French did not feel this, and their altars arranged round a chevet face all ways. In Germany and in England, at any sacrifice almost, altars were made to face west. A singular instance of this I discovered in the crypt of Christ Church Cathedral, Dublin, where, in spite of the adoption of an apsidal termination to the choir, the three chapels to the east of it are all square-ended, so that all the altars might face the same way; and in Germany, where an apse is built with a number of altars, you will find that they are placed, without any reference to the slope of the walls of the apse, facing due west. A strong tradition of the sort may easily have been offended by the apsidal form. The subject ought to be gone into more thoroughly than I have ever seen it treated. It is one of extreme interest, and an almost unique example of a national submission to a new type of plan, suddenly changed into a determined return to the older and,—with the Conquerors,—evidently unpopular plan. Certainly, within 150 years of its introduction the use of the apse was abandoned, and almost every church in the thirteenth century in England was built with a square east end. The fact is so important, as bearing on the subsequent progress of English art, that it deserves our careful attention. You will recollect that almost all the problems which the French architects set themselves to solve were connected with the more perfect planning and designing of the chevets of their churches. They have left other magnificent examples of their skill; but it is to this part of their work that I always find myself most attracted, and in which I am sure that they were themselves most concerned. In England, on the contrary, the prejudice against the apsidal end left the architects more free to devote themselves to all parts alike, and in the case of small churches, if the English system was less academic and exact than any can be which treats the support of stone vaults as the one great thing to be contrived, at the same time it secured an endless and picturesque variety of plan and design, in this respect excelling, in my judgment, all other countries. Observe, also, that the ingenuity of the French architects was devoted even more and more to the increase of the height and the decrease of the apparent means for supporting their lofty churches, so that by degrees it was of the interior of their churches that they came to think most, leaving the exteriors to some extent to take care of themselves. The English architects, on the other hand, being far less occupied with these particular scientific problems of construction, devoted themselves with all the greater zeal to the developing of the detail of their buildings, and being very practical artists never lost sight of the importance of making the exterior as beautiful as the interior. The vast height of such churches as Amiens, Beauvais, Bourges, or Le Mans, makes it impossible that the exterior should be a complete whole, from whatever point it is viewed.

Canterbury, Lincoln, Wells, Salisbury, Lichfield and York, not to name others, are all churches in which the height is insignificant when compared with the French examples just mentioned. But they are all complete and beautiful works on the outside as much as inside. Nowhere else in Europe is so good and strict a proportion observed. The moderate height of the roof made it possible to erect towers, or groups of towers, which, without trying to attain impossible dimensions, are nevertheless magnificent works. The towers of the west front of Amiens only look like towers when seen from the west front. When seen from the side in connection with the church they shrink into mere turrets. Then, English architects had great common sense. They realised that the effect of size is not given by height alone. They knew that the effect of length in an interior was just as impressive; and by making the height of their buildings moderate, they immensely increased their apparent length. I remember spending a day at Amiens once, wrapt in admiration of its magnificent interior, and only wishing occasionally that the limits of the church allowed me to take in the upper part of the work, the clerestory and vaults, without lifting my head to an inconvenient angle. The next day I was at that loveliest of English 14th-century churches, Exeter. I went somewhat in dread of what I should feel. But the modest dimensions of the interior—not much more than a third of those of Amiens in height—I found had been so used by the Englishman as to produce effects of infinite length, of size, of mystery, of beauty, to as great a degree as the work of the Frenchman had produced them. It is the modest completeness everywhere, the variety and beauty of the detail, and the judicious adaptation of the means at disposal to the end required, that strike me as the great achievement of the English school of architects of the 13th century. I hope I have travelled too much, seen too much, and admired too much the great works of other countries to be a prejudiced or unfair judge of the comparative merits of their respective works. But to me it seems matter for real congratulation that the students of our art have around them in this country on all sides buildings which are in almost all respects as well worthy of study as those of any other country, whilst in some of the highest qualities they are, if not unequalled, at any rate unsurpassed.

The preference for the square plan of the east end of our churches was one only of the marked differences between English and French architects. The next in importance was the indifference of the former, save in very important works, to the use of stone vaulted roofs. This indifference led, no doubt, to far greater facility in the way of changing the form of the ground-plan—and led to a freer and more picturesque if to a less stately and formal mode of design than the French system did.

But even more important than this difference is that which we find in the treatment of the capital by the two schools. In France, in all early architecture, the upper member or abacus of the capital is square on plan. This is the Classical outline. It was modified at the end of the 12th century by first taking off the angles. Then they were made octagonal, and at the end of the century a variety of angular lines were adopted; and, save in such churches as Bayeux, Coutances, Norrey, and the Castle of Mont St. Michel, the circular capital is rarely seen. These exceptions prove the rule, for the architecture of Normandy in the 13th century ran a parallel course with that of England, and shows very nearly the same sort of developments. Broadly speaking, therefore, it is the fact, then, that the abacus of the capital is in French architecture square, in English circular. The results on the character of the architectural details from this small difference were very remarkable. French architects satisfied themselves with few simple and very uniform mouldings. The most common of all is the edge-roll, with a hollow on each side of it—a moulding which at no time has very much beauty, and soon satisfies the artist as to its capabilities. The square outline of the capital seems to necessitate an equally well defined and sharp outline for the section of the arch. Broad strongly-marked lines prevail, and comparatively little care is shown to vary the mouldings which are used. The effect of the employment of the circular capital was curiously different, and equally well marked. The general lines of the stonework of an arch which is fitted either to one, or to a succession of round capitals, are much softer and less positively defined than the former. The shadows are less strongly marked. With a succession of capitals which have a square abacus you have of necessity a succession of orders in the arch which have soffits at right angles to the face of the wall, and your mouldings are bound to keep to this

outline. With a succession of circular caps all the angles have to be chamfered off, and the general line of the arch is at an angle of 45° to the face of the wall. At first sight this involves much less light and shade, and much less decided effect, and it becomes more than ever necessary to mould the stones in such a way as to produce the decided effects of light and shade which are required to make the effect of the arch perfect. Thus the circular capital leads naturally and insensibly, almost, to the development of the art of moulding, or (where mouldings have to be eschewed) to the soft and delicate chamfer in place of the strong and vigorous effects of the square abacus and square soffit in the arch. The circular abacus is seen but rarely in Norman work in England. Among the earliest examples that I remember are the cathedral at Gloucester, Tewkesbury Abbey Church, and the fine crypt under the choir of St. Mary's, Warwick; and at Canterbury one of William the Englishman's first variations from the work of William of Sens was the introduction of circular moulded capitals into his work. After his time it is extremely rare to see anything save the circular or the octagonal cap used.

(*To be concluded.*)

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE eleventh ordinary meeting of the Institute was held on Monday evening, the President, Mr. John Whichcord, F.S.A., in the chair.

THE LATE MR. W. BURGES, A.R.A.

The Secretary announced the deaths of M. Gabriel Jean Antoine Davioud, hon. member of the Institut de France, of Paris, hon. and corr. member; of the Rev. Richard Burgess, B.D., hon. associate; and of Mr. William Burges, A.R.A., fellow. The President having notified that the memorial-brass to the late Sir Gilbert Scott was now on view at the Royal Architectural Museum, Mr. Street, R.A., rose and said that he thought that a little more attention should have been called to the loss the profession had sustained in the death of their friend Mr. Burges. He and Mr. Burges practically commenced life together in the Lille Cathedral competition, and they had been the best of friends ever since. All Mr. Burges's work was full of interest to his professional brethren, and his knowledge of all antiquarian and archæological matters was very great. His drawings showed extreme skill and taste, and he felt sure that all members of the Institute deplored this sad event. Mr. A. Cates referred to the loss archæology had sustained in the death of Dr. Burgess, who had in so kindly a manner frequently instructed their members on antiquarian discoveries in Rome and Constantinople, and remarked upon the coincidence that two members of almost the same name should have passed away from amongst them at the same time. The President said he fully concurred in the remarks of Messrs. Street and Cates, and had himself refrained from alluding to those lamented deaths, as he anticipated that the Council would at a future time prepare a full biography of deceased members.

ELECTRIC LIGHTING AS APPLIED TO BUILDINGS.

Mr. John Slater, B.A., A.R.I.B.A., delivered an address on this subject. He commenced by observing that an architect was nowadays compelled to have a much wider range of knowledge than would have sufficed for him a generation or two ago. This was particularly the case with scientific subjects, as no one could tell how industrial arts or manufactures might be affected by scientific discoveries. Hence an architect was bound to take an interest in such subjects as soon as they appeared likely to have a practical bearing on his work. Electric lighting, the knowledge of which had advanced with rapid strides during the past few months, was precisely such a subject, and his object would be to show how the architect might hope to take advantage of the discovery in his buildings and use it with success. The main divisions of the subject would be the following:—1. The means of producing the electricity. 2. The various systems of electric lighting in practical use. 3. The effects and advantages of the light. 4. The cost of producing it. After giving a short history of the invention, and describing the first discovery by Humphrey Davy of the light between carbon points, Mr. Slater showed that so long as batteries offered the only means of producing the electricity, the cost of the electric light was practically prohibitive, and for many years it remained nothing but a striking and beautiful experiment. Faraday's discovery of induced magnetism in 1830 was a great step in advance, and this led to the invention of the electromotor machines of Nollet and Holmes, which were speedily utilised for the production of the electric light for coast illumination; these machines were called magneto-electric, and in their construction permanent steel magnets were used. The more recent machines were of the type called dynamo-electric, in which permanent magnets were replaced by small electro-magnets, and the invention of these machines was the result of the discovery made in 1867 by Dr. Werner Siemens, Sir C. Wheatstone, and Mr. Varley simultaneously, that feeble currents could be induced in a coil of wire by the residual magnetism in any piece of soft iron that had once been magnetised, and that such currents could be made to react on the iron and thus again on the coil until they gradually augmented the strength of the magnetic field, and with it the intensity of the current in the coil until it reached a very high pitch. After alluding to the various dynamo-machines which had been invented, and stating that the two most extensively used in this country were the Siemens and the Gramme, Mr. Slater gave a general account of the latter, which was illustrated by diagrams. The Brush machine was then referred to as being capable of sustaining as many as sixteen lights in one circuit, while the Bürgin, now being experimented with in Switzerland, though the last invented, appeared likely to become a formidable rival to the Gramme. Before leaving this branch of the subject it was necessary to discuss the question of the best and cheapest means of obtaining the motive power for driving the electrical machines, and a comparison was instituted between water-power, steam, and gas. It had been expected, he remarked, that steam motive-power as employed in factories would prove a convenient and economical mode of driving the dynamo-machines, but experience showed that not only was it rarely sufficiently steady for the purpose, but that the steam-engine was not continuously at work throughout the time that artificial light was needed, and hence it was necessary to erect a special engine. For such low powers, and for the great regularity of movement required, gas-engines presented manifest advantages, and the display of various lamps which he should make that evening were to be worked by a six horse-power "Otto Silent Gas-engine," kindly lent by Messrs. Crossley Brothers, of Manchester. Of course where water could be utilised it was infinitely the most economical motor, and at Sir William Armstrong's mansion at Cragside, Northumberland, a small waterfall was thus employed without cost to work machines which lit up the principal rooms. With reference to the second part of his subject, the author remarked that the various systems of electric lighting could be broadly divided into two groups—the arc-light systems and the incandescent systems, while these also in turn could each be divided into two branches, viz., the systems of arc lighting using alternating currents and those using continuous currents; and the quasi-incandescent and incandescent proper. The Jablochkoff lamp was selected for description as using alternating currents; and the Crompton regulator lamp as using continuous currents, which description would apply, with slight variations, to the other regulator lamps, such as the Serrin, Brush, Siemens, &c. The necessity of burning good carbons was alluded to, and it was mentioned that in the earlier experiments with the Jablochkoff lamp on the Thames Embankment, kaolin was employed to separate the carbons; but lately plaster of Paris had been substituted, with good results, and the cost was greatly reduced. The aim of late had been first to get "candles" which should be comparatively cheap and should burn regularly, and then to devise some automatic apparatus for bringing the positive and negative carbons, as they consumed, perpetually to the same relative distance from each other. The well-known "switching" process, by which a transfer of the current is made to fresh carbons in the comparatively rapid-burning Jablochkoff system was fully described. In the alternating, as opposed to the continuous currents, there were several manifest advantages, such as the ease of devising regulating machinery to keep the carbon points apart, the light was of powerful character, the currents burned away the carbon points equally, but the former had also great drawbacks; amongst these might be mentioned the incessant hissing noise resembling the buzzing of flies, caused by an extinguishing and relighting of the arc too rapid to be detected by the keenest eye, but very apparent to the ear, and there was a predominance of violet rays. These mattered little in outdoor illuminations, the chief disadvantage was that the light was obtained at a needlessly great and therefore extravagant expenditure of force. There was something which approximated to an inertia to be overcome in producing the alternating light, and this inclined the balance of economy considerably towards the adoption of a "continuous" mode of production. Further than that, the alternating systems were extremely dangerous; several fatal accidents had occurred from incautions handling of wires under this system, whereas no harm had as yet occurred from a continuous apparatus. Of the latter class of apparatus the author showed an example in a Crompton lamp, which was hung in a domical cove in the centre of the room above a gaselier, and effectively lighted the whole apartment. On this light being replaced by the gas-jets in the centre and sides of the room, the yellow and relatively dim light evoked loud calls to "turn the gas fully on," until the audience perceived their mistake. The lecturer said the Crompton light, then exhibited, was, in his opinion, the steadiest yet seen, although, as that apparatus had only been temporarily fixed for the evening, it was hardly a fair illustration. The carbon points originally made from gas-coke were, in this instance, a marked improvement, and were supplied from Paris, by M. Carré. The upper carbon in the Crompton lamp was burned away much more rapidly than the lower one, and in form of a crater, and this concavity greatly affected the direction and character of the light, which was directed towards the floor, as from a glowing sun. Indeed, experiments showed that in this light 75 per cent. of the total arc was given off within an angle of 60°, and from the upper carbon. In a very large room or hall, nothing could be more effective than this continuous light, but, for small apartments, some incandescent system must be adopted. Of the quasi-incandescent lamps, the Werdermann was described; but it was stated that till quite recently the applications of this system had been so few that it could hardly be said to have passed the experimental stage. Within the last few weeks, however, a lamp invented by Mr. H. F. Joel, of Queen Victoria-street, E.C., had been brought into public notice, which was a vast improvement on anything that had been previously done in this system of lighting. The peculiar feature of this lamp was that the upper electrode was a large copper disc, against which the lower (the negative carbon) impinged. The copper disc would last for a long time before it oxidised, and only the carbon was consumed. This lamp was superior in brilliancy to any of the incandescent lamps, and almost equally steady, while its mechanism was such that anyone could handle it without difficulty or risk. A number of the lamps could be burnt in one circuit. It had, however, the drawback of being rather wasteful of current. A series of specimens were here lighted, and, with a slight interval, were maintained throughout the remainder of the evening, their steady and comparatively subdued glow, although placed in clear glass lamps, being generally remarked upon. The author remarked that the special feature of this lamp was, that it was not too intense to be introduced into the parlour. The principal incandescent systems were then briefly referred to as being much simpler than the arc system, and the lecturer specially noticed those of Edison, Sawyer-Mann, Lane-Fox, and Swan. Having paid a warm tribute to the inventive genius displayed in many forms by the mechanician of Menlo-Park, to whom we owed much of the development of the telephone and phonograph, Mr. Slater observed that it was much to be regretted that Edison's admirers were unable to restrain within due limits the enthusiasm with which his achievements had inspired them, as there was

certainly no real reason for the extraordinary depreciation of gas shares, which ensued upon the receipt of various telegrams from America reporting the success which had attended Mr. Edison's experiments. The lamp selected for detailed description was the one invented by Mr. Swan, of Newcastle, and its simplicity, steadiness, and cheapness were pointed out, the author observing that he was confident that if electricity was to be applied to our private houses for lighting purposes it would be in some such form as this, as no one could desire a more beautiful light. Unfortunately, the current proved too strong for the series of eight lamps shown, and after one or two of the carbons had snapped, the lecturer was obliged to revert to the Joel lamp. Mr. Swan took up the subject anew three years ago, and had recently perfected his very simple system. It consisted of a small glass globe containing in a perfect vacuum two wires connected by a minute filament of carbonised paper, a mere thread, yet so hard, tough, and elastic that there was no reason, given a regulated and not too powerful current, why it should not last for twelve months. The globe itself, exhausted to a vacuum, and fitted with the filament, would not cost when made commercially more than a shilling, and would afford a steady, powerful light in a private room. Proceeding now to his third point—viz., the applications of the electric light, Mr. Slater observed that these were so numerous and of so varied a nature that it would be impossible to discuss them all, and he should, therefore, omit all reference to its use in public streets, lighthouses, vessels of war, mines, or for military purposes and marine signalling, and should confine his remarks to its advantages in buildings and for building operations. In the latter case the architect had here ready to his hand the means of carrying out important building operations in little more than half the time usually required, and the superiority of the use of electricity over that of large flaring gas-lights was conspicuous; although engineers were more likely to avail themselves of the light for such purposes than architects, yet it supplied a great want for both. Where night work was imperative, the electric light afforded an efficient, convenient, and safe method of illumination. At the Barden reservoir it had already been employed under Mr. Crompton with excellent results. But architects were chiefly concerned with the interiors of buildings. The conditions necessary to be observed for the effectual artificial illumination of an interior were not so simple as might be imagined, and varied in particular cases. A concentrated light was required in some cases, in others a diffused one, the latter being of much the more frequent occurrence, and, for the former purpose a Crompton lamp was suitable, for the latter a Swan or Joel lamp. As a general rule it might be laid down that the nearer we were able to approach to the effect of natural daylight in our artificial illumination the better it would be. The electric light had been shown by the spectrum analysis to be precisely similar in composition to sunlight. The question of suitable reflectors was then touched upon, and Mr. Slater observed that if one of the arc regulator lamps were hung a few feet away from the ceiling of a room, and the light, although itself hidden, were reflected upwards on the white surface of the ceiling, the result would be a diffused light over the whole room, much more agreeable than that given by the lamp itself. Some such system as this had been adopted at the Station of the Chemin de Fer du Nord in Paris, and with the Jablochkoff lamp at the Picton Reading Room in Liverpool; but such an application had not yet apparently become general, and in the latter case it was reported by Mr. Picton not to be a perfect success. The advantages of the electric light over gas or oil were then enumerated:—1st, as to illuminating power. Photometry was not at present an exact science, and the readings of comparative brilliancy depended so largely on the observer's skill, accuracy, and judgment, that the statements varied greatly, but the extreme brilliancy of the light was admitted by all. The result of experiments made at the South Foreland Lighthouse showed that the electric light there displayed was equal to 8·31 times the light of the large six-wick Trinity oil-lamp, which itself was equal to 722 candles, so that this would give 6,000 candles as the value of the light. The various arc lights in general use varied from 2,000 to 8,000 candles; the Jablochkoff lamp varied from 300 to 450 candles; Mr. Swan's little lamps equalled 30 to 40. Candle measurement was, however, extremely unsatisfactory. A new method, suggested by Mr. W. H. Preece, of measuring the intensity of the light by the area illuminated to a certain standard was alluded to, and details were given of the result of such a test when applied to various lights. 2nd, as to quality. Everyone was aware that in gas-light the yellow rays predominated so largely that it was impossible to distinguish blues, greens and other delicate tints; consequently it was imperative that the decoration of rooms for use at night should be in strong colours not suitable for daylight. The reason for the excess of yellow in gas-light was shortly stated. It appeared to be almost established that the radiating heat properties of an incandescent body varied inversely to the intensity of the light thrown out. The invisible radiation in burning gas was very great, whereas it was very slight in the electric light, where the heat at the carbon points was so intense that all the colours of the spectrum were produced, the result being a light of great purity and whiteness. Hence its value for shops and factories where coloured goods had to be examined and sorted; also for picture-galleries, while if its use became general ceilings would not become blackened nor decorations tarnished, and the danger of fire would be reduced to a minimum. As so little heat was radiated into the air with the electric light the temperature in its neighbourhood was but slightly raised, so that all rooms would be much cooler than under the present system of lighting. Calculations were given showing that one of the large arc lights of 4,000 candle-power radiated rather less heat into a room than one good gas-burner of 15 candle-power, while the small Swan lamps radiated, practically speaking, no heat. It was unnecessary to dilate upon the great advantage of this in public assembly-rooms. Although, as yet, but few experiments had been made with a view of determining the effect of electric lighting on the acoustic properties of a room, it would probably be found that these would be greatly improved. Professor Tyndall had ascertained that waves of sound were interfered with far more when they had to pass through atmospheres of differing densities than when such variations did not exist. The heated currents of air in a gas-lit concert-room must necessarily cause the formation of strata of varying densities, and this was probably the cause of the complaints which were occasionally made of the different acoustic properties of a room when used at night and in the daytime; so that in electricity the architect would probably find a valuable and unexpected acoustic ally. The proper ventilation of rooms was next alluded to. Public rooms, particularly when used for large assemblies by gas-light, were always difficult to ventilate adequately. Besides the oxygen consumed by the audience there was the abstraction from the air of the oxygen required to support the combustion of the gas. With electric lighting the conditions were quite different; the light was equally brilliant in a vacuum as in the air, and no oxygen at all was consumed by the glowing filament of carbon of the incandescent systems. There was a slight consumption of oxygen with the large arc lights, but careful calculations showed that a large arc light of 4,000 candles nominal-power would abstract from the air in three hours only about 6 cubic feet of oxygen, while gas-burners giving the same amount of light, would, in the same time, consume 4,680 cubic feet of oxygen, or about 780 times as much as the electric light, and the Swan lamp glowed *in vacuo*. This showed how vastly more simple became the problem of securing the efficient ventilation of a room when this enormous consumption of oxygen was got rid of, as the air would not require renewal so frequently, and therefore fresh air could be introduced much more slowly and draughts would be diminished. Equally beneficial results would attend the introduction of the electric light into private houses, workshops, factories, &c., and the sanitary condition of the workpeople and others employed would be materially improved. It was natural that objections should be urged against the light. It was asserted to be flickering and too white; but it was shown that the flickering had been largely overcome in the later inventions; and as to its whiteness, no light was intended to be itself looked at, but to enable other things to be seen, and the whiteness could at any time be obviated by using coloured glass shades. The risk of accident was then alluded to, but Mr. Slater said he considered the risk infinitesimal, and far less than that attaching to gas-lighting. Allusion was made to the recent burning of the Opera House at Nice, in which case great loss of life would have been avoided had there been a separate source of light besides gas, for it was the sudden extinguishing of all the lights at the first explosion that caused the panic which led to more deaths from suffocation than from burning. A formidable indictment could be framed against gas on the score of explosions, leaky pipes, frozen meters, &c., from which drawbacks the electric light was free, so that the slight objections against the latter, which were in many cases more ideal than real, seemed far outweighed by its numerous and great advantages. The question of the cost of the electric light was a very important one. Much depended on the motive power used for generating the electricity. When water power was available the cost would be extraordinarily low. Steam power come next in order of economy, and a gas-engine was the most expensive. Details were given of various experiments, from which it was deduced that with a good steam-engine a light of 204 candles could be obtained for every pound of coal consumed, while if the same light were obtained by turning coal into gas, even allowing for the return, as coke, &c., of half the amount of coal used, nearly 8lb. of coal would be required, so that electricity was eight times as cheap as gas. If electricity were generated by a gas-engine the saving would be in the proportion of about 5·3 to 1. Various details were quoted of the actual cost of the light at the Albert Hall (30s. 6d. per evening against 87s. 6d. for gas), British Museum (2s. 6d. per hour against 15s. 6d. per hour), Alexandra Palace (6s. 1d. per 4,000 candle-power light per hour), and other places, the figures varying from 7d. to 4d. and 3d., while it was stated that it was expected the Jablochkoff lights on the Embankment would soon be reduced to little over 2d. per hour, and the little Swan lamps would cost, it was estimated, ¼d. per hour each. The various incandescent systems had not been tried long enough to enable details to be given, but the improvements made all along the line during the past year warranted the indulgence of a confident expectation that the cost would still diminish. The author then discussed the possibility of architects being able now to avail themselves of the electric light, and instanced the case of large country mansions, factories, hospitals and other such institutions, where electric lighting could be established at less cost than gas lighting. The difficulties in the way of lighting a large number of private houses were much greater, as the question of distributing and measuring the electricity could hardly yet be said to be settled, but the efforts of Mr. Lane-Fox, Mr. Edison, and Mr. Swan in this direction would probably soon be successful. It was, however, absurd to predict the arrival of a day when the last gas tap would be turned off for good, as such an invention as gas could never become useless or unnecessary, just as oil still contined to be used in spite of the progress of gas illumination; but for the production of an almost perfect light, under certain conditions, gas could never hope to rival its brilliant compeer. Mr. Slater concluded his paper thus: "The electric light is, we may predict, even yet in its infancy. Although it is eighty years since Science gave us this brilliant means of illumination, and fifty years since she supplemented that gift with another, enabling us to do away with the old and cumbrous means of producing it, it is only within the last few years that any progress has been made in the industrial application of the discovery; but during that time the advance has been so rapid and the improvements in every direction so great that he would be a bold man who should predict a limit to its future possibilities."

The President remarked that it was long since they had had so brilliant a subject or so lucid a lecturer, and invited discussion on the subject.

Mr. John Hopkinson, F.R.S., said although it was true that the electric light was almost identical in its colour properties with sunlight, there was a greater amount of radiation of the ultra-violet or actinic rays, which produced an unpleasant action on the eyes and skin of those who exposed themselves much to this light, and

even affected their ability to sleep. The arc also produced certain nitrogenous combinations when displayed in the air. As the light developed itself he believed they would experience greater economy in its uses. It would be interesting to know, if in the experiments quoted at the close of the address, the items of depreciation, interest, and profit had been included in the relative cost of the electric light as against gas.

Mr. Lane-Fox spoke of the rapid progress that had been made in the utilisation of the electric light, and suggested that while the domestic use of the light was now possible, it appeared probable that in a very short time it would become practicable. It could be as easily distributed from a common centre as gas, and with more economy, while there was much less danger from leakage.

Mr. Horace Jones alluded to the experiments made at Billingsgate Market 18 months since by the Markets Committee of the Corporation as having been somewhat premature, and asked whether it might not be possible at some future time to obtain the electric light from batteries instead of by steam or gas-engines. He proposed a vote of thanks to Mr. Slater.

Mr. Crompton replied that to revert from friction to batteries would be a retrograde step. The philosopher's stone now sought by electricians was some means of storing electricity for a period as in a gasometer, and a discovery had just been announced by a Parisian *savant* which promised a solution of this problem. In the experiments made at Glasgow and elsewhere, he had included in the published cost a living profit as well as an allowance for interest on and depreciation of plant.

Mr. A. Ward, engineer to the British Electric Light Co., explained that the light used at the Picton Reading-room, Liverpool, was the Serrin, and not the Jablochkoff system, as stated by the lecturer.

Mr. Street, R.A., asked if the Joel light then shown was as steady and perfect as it could be made. In his opinion it flickered too much for him to recommend its use in any building where reading would be carried on. He could not exaggerate its brilliant effect, cleanliness, and safety, but this unsteadiness was a serious drawback. He was at the present time prepared to introduce it into the New Courts of Justice, but would not do so until he could be quite certain that it would prove successful, and electricians would recognise that it was not in the power of architects to delay the lighting arrangements of buildings while experiments were being carried out with the systems of illumination. He wished to second the vote of thanks to the lecturer for his admirably-delivered address.

The vote of thanks having been carried by acclamation, Mr. Slater responded, and explained that the electric light had not been advantageously displayed, as all the arrangements and connections had been made by an apprentice of a year's standing within an hour of the time announced for the lecture. The gas-engine, while an admirable means of driving the machinery, was not manufactured nor specially adapted for the purpose, and only careful experiments would show the exact rate applicable to each system of lighting, every one of which needed a special speed. The light had therefore fluctuated more than ought to have been the case. He ought, perhaps, to explain that he had not the slightest interest in any system of lighting, and had only taken up the subject from an architect's point of view. The system was but in its infancy, and so far as he could learn, no chemist or engineer had as yet specially devoted himself to the preparation of carbon points for the production of the light, and it was probable that they could be made of much more perfect homogeneity. Batteries, he might remind Mr. Jones, were both expensive and objectionable, on account of the fumes evolved, and for several reasons had been abandoned for friction systems. Mr. Warren de la Rue was now experimenting with a great battery, from which he expected great results.

FIRE IN THE HAYMARKET, AND THE VALUE OF IRON-ENCASEMENT.

A SERIOUS fire broke out on Saturday night before eight o'clock, at the newly-built stores of the Civil Service Co-operative Society in the Haymarket, which in its destructive fury, aided by the inflammable nature of the contents of the block injured, threatened to make a complete wreck of these recently-built premises, and would undoubtedly have done so, but for the adoption of a system of iron-encased construction, to which we shall briefly allude. The building occupied by the Civil Service Co-operative Society has its entrance in the Haymarket, which has only recently been erected from the designs of Mr. Verity, the architect. The main portion of the stores, however, extends to, and fronts Oxenden-street, and forms an extensive frontage towards it of eight and nine floors. This block was connected with the Haymarket front by an irregular block of building, and it was at a point near an area for light and air that the fire first originated. The flames soon were seen to burst out from the roof at the southern end of the premises in Oxenden-street; but, thanks to the fire-proof construction which had been introduced upon Messrs. Dennett's system, the principal stories of the Oxenden-street block were saved. The fire, which originated in the brush-room, the middle building, and which entirely destroyed it, found its way into an upper floor (3rd floor) of the Oxenden-street block, and ultimately burnt off the roof at the south end of that block, yet actually left intact the floors immediately above and below it, thus enabling the business of the stores to be carried on as usual, and without interfering with the hands employed. And this was possible only because the fire was limited to the story in question, and mainly because the Dennett fireproof construction of the floors effectually intervened and cut off the floors above and below. That the fire was a fierce one, and assumed the nature of a furnace between the two floors, may be gathered from the fact that the third floor was used as a grocery store, and was full of oils, candles, spirits, and various other kinds of highly inflammable substances, while the top part of the premises was used for the storage of oils, &c., and the flames were fed by the liquid running down the sides and walls, and by the draught occasioned by a large lift in this part. Nothing appears to have been wanted to make the fire a terribly destructive one, and a most severe test of the fireproof floors and their supporting columns. No less than thirteen steamers and two manual engines were present.

An examination of the building, for the purpose of discovering the effect of the flames upon the Dennett system, has completely convinced us that the method of construction adopted, of which this is one of the most successful types, is the only one that will arrest the flames of a raging fire, and make it possible to confine a fire to the story in which it originated, without imperilling the safety of the structure by the action of heat on the ironwork. We may inform our readers that the whole of the blocks which have so marvellously escaped destruction are of brick, with floors of the Dennett construction from basement to roof, with the exception of those roofs burnt off, which were of timber. The columns carrying the floors throughout are cast-iron stanchions of cross-section, beginning in the basement with 18in. by 2in. thickness of metal, and at the floor in which the fire occurred, 12in. by 1½in. These columns at the base have been calculated to maintain 300 tons each, and are provided with specially-cast spreading footings 5ft. in diameter, the floor being estimated to carry 3¼cwt. per square foot. But the principal point in the system is the encasing of these iron stanchions in the Dennett concrete, so that externally they assume a circular form, and are finished in ordinary plaster. If the iron stanchions had been exposed to the action of the flames and water, there is little doubt what would have been the fate of the stories above, as they would in all probability have snapped, and the whole superstructure falling, would have brought speedy destruction to the premises. Ascending to the floor in which the fire raged with fury, evidences are not wanting of its fierceness. While all the fittings of wood and the innumerable contents are lying in heaps of indistinguishable débris about the floor, and the thin surface-plaster of the columns and some of the arches between the girders have peeled off in places, exposing the bare concrete, no sign of structural damage can be detected in the columns and arched ceilings, which latter still retain the sharp imprint of the centring boards used in forming them. Entering the adjoining room cut off by a partition, we find the roof a charred mass of wood, and the blackened and charred guides or runners of the large lift, tell a tale of the fury of the flames fed through this shaft. Ascending to the floor immediately above the third floor, we did not notice any sign of the devastation below: the cases, and the flooring, and the goods are untouched, and the only mark of last Saturday's conflagration are the panes of broken glass in the windows. A portion of outer brickwork exposed to the action of the flames showed the mortar-joints seriously damaged and otherwise scaled. The rear block, we may add, is a building of nine floors, about 70ft. by 70ft., the three lower stories being below the street level. There were, therefore, two floors and a flat roof above, and six stories below the room, the contents of which were destroyed. Such a mass of building and combustible contents has been saved by a precaution which, we are sorry to say, is not adopted in a large number of buildings professing to utilise fire-proof construction. The encasing of the ironwork in this instance, on a method designed by Messrs. Dennett and Ingle, to meet the objections against exposed ironwork, especially the encasing of the columns, has been the means of saving not only a very large amount of property estimated at a considerable sum (the building itself cost at least a hundred thousand pounds, and the contents were worth about as much more), but also damages the society would have sustained if the premises had been rendered useless, and the hands engaged dismissed. In this instance, at least, an immense service has been rendered, and Mr. Verity, the architect, deserves credit for having insisted upon introducing the system in its integrity, and encasing the iron columns, instead of allowing a parsimonious spirit to prevail, which usually seeks to cut down all expense in fire-proof detail as apparently superfluous or unnecessary.

A NEW SMOKE-CONSUMING, SLOW-COMBUSTION GRATE.

MR. EDWARDS, jun., of the firm of Edwards and Son, Great Marlborough-street, and author of works on "Domestic Fire-places," and "Ventilation," has just introduced a new grate which, from what we have seen of it, appears to meet the objections so long entertained to Dr. Arnott's grate, and to a considerable extent solves the smoke-fog question which has so recently been pressing upon public attention. The chief improvements made by Mr. Edwards consist in allowing the fire in the fire-basket to burn gradually downwards till the whole fuel is consumed, as in the Arnott grate. Instead of a sunk ashpit, or machinery to lift the basket of coals as it burns down, Mr. Edwards dispenses with the former and provides a balanced blind to be adjusted by degrees in front of the fire. This blind of sheet-iron is balanced by chains and weights on each side of the grate in front, so that any defect can be at once put right. In front of the grate is a wire-basket to catch all the coal that falls, and the smaller cinders or dust fall through into a trough below, out of sight and can be readily removed or re-used. The grate we inspected was very simple and effective in the construction—an important point in favour of Mr. Edwards's modifications. The fire-basket is of fire-brick with a solid bottom, and there is sufficient depth to allow the fire to last a day or a night, though the receptacle may be made to hold enough fuel to burn for 18 hours. Before the wire cinder-basket a fender-guard is fixed to protect the dress of persons near, and the brass rail and appearance of this guard makes a pleasing substitute for the common fender. Outside the fender-guard, a tile or marble hearth can be laid. In addition to these advantages the chimney draught can be regulated by a valve, moved by a chain in front of the grate, thus avoiding dirtying the hands as with the common register door. This grate can be easily set, and Mr. Edwards claims the following advantages for it:—(1) A practical immunity from smoke. (2) A fire that will burn from morning till night, or from night till morning, with little or no attention. (3) No chimney-sweeping except, perhaps, once in ten years. (4) No coal-scuttle, except at lighting the fire. (5) No tongs or fire-shovel. Mr. Edwards has, in short, in his new grate studied and applied all the requirements of a perfect grate, adopting all that is good in Dr. Arnott's grate, Mr. Good-

child's, and other forms, while avoiding all that has been found objectionable in the otherwise perfect system of Arnott. We may add that this grate may be made more effective by admitting the fresh air through a distinct channel from the exterior below the floor entering at the back of grate, where, getting warm, the air can be allowed to enter the room at a warm temperature, instead of finding its way in cold currents from doors and windows. By doing away with the sunk ashpit and regulating the blind by side weights, Mr. Edwards has simplified the older arrangements effectually, and has produced not only an economical grate, but one capable of burning all day or night without attention—an important consideration in labour-saving in public offices and railway-stations, as well as in the bedroom of the invalid. Artistically, the grate is simple in form, and the sides can be relieved by tiles or repoussé ornamentation. A grate in operation may be seen at Messrs. Edwards' show-rooms, and is worth the attention of architects.

A NEW PAINT-BRUSH.

AN invention has recently been patented by an architect, Mr. Edward Wright, having for its object the avoidance of the painter's great grievance of the hairs coming out and spoiling his work. In the ordinary paint-brush, the bristles are fastened into the binding by driving the tapered wooden handle in from the top of the brush, and thus wedging the whole together, the ends of the bristles being then covered with cement to make them more secure. Of course, the wood expands or contracts according as it is wet or dry, and this expansion and contraction of the wood is one cause of the bristles coming loose. Another defect of the ordinary brush is the length of the bristles covered up by the binding: this is usually about an inch and a half; and as the price of bristles varies according to their length, any mode of fastening which will use up less hair will be an advantage. When a painter uses a new brush, he has first to put on a "bridling" or tying of string, about a couple of inches up the hairs, to keep them from spreading about too much and splashing the paint; as the brush is worn down the bridling is removed, but the hair underneath is found all matted together with the paint, and it has to be scraped and rubbed about a long time to get it soft; even then it can only be used for second-class work. The bridling also, by drawing the hairs close together, prevents the brush covering so large a surface as it should do, and materially lessens the elasticity of the hair. Moreover, before a brush is used it has to be soaked in water to swell the wooden handle and prevent the hairs from coming out. By the invention of Mr. Wright the knot of hair is made up quite separate from the handle, the bristles are firmly secured in a narrow brass or copper band about ½in. wide, and by an ingenious little contrivance they are bound together under great pressure, with a metal core or centre inserted in such a manner that it is impossible for the hairs ever to get loose. The handle has on the top of it a brass socket, made of thin pressed metal; into this a knot of hair is inserted, a ring is pushed up, and the brush is ready for use; it requires no bridling of string or soaking in water, which two operations alone cost a painter one hour's labour, or 7d. added to the expense of the brush. The length of hair in use in the new brush can be regulated with ease as the bristles are worn down. There is more elasticity in the hair from the absence of bridling. The painter gets the use of quite an inch more hair, and when it is worn out a new knot can be bought and inserted in the handle for considerably less than the cost of a common brush, and the handle will last for years.

SANITATION AS AN INCREMENT OF VALUE IN HOUSE PROPERTY.

THE adjourned discussion on Mr. H. H. Collins's paper on this subject was concluded at the last meeting of the Institution of Surveyors. Mr. E. C. Robins said the paper had not enabled him any more to estimate the "increment of value," and, indeed, its figures as to relative costs of alterations and improvements to houses were so contradictory, that he could not see from the data given how the valuer was to readily estimate the increased benefits of sanitation at a money value. He suggested that that institution should appoint a committee to collect and tabulate facts, and so obtain averages from many men's experiences. Mr. W. P. Goulding, of Manchester, thought that though there might be an increase of value arising from efficient sanitation to a purchaser for occupation, the owner or surveyor dealing with land found no appreciable addition to the ground-rent from this source. The result to be looked for from the education of the public was not an actual increment, but a greater demand for carefully-drained houses. Mr. G. Barnard explained that he had got rid of the connection of his house with the sewer by collecting the sewage in an air-tight receptacle, containing earth, and provided with a ventilating tube, and a few holes pierced in the bottom of the box; when filled, it could be taken away, and the contents applied to the fields, another box being substituted. If this plan were adopted for 500 houses, he believed a profit of £1,000 a-year could be made. In reply to Mr. W. White, he said the plan had been only tried at his own house, and for three months, but had answered admirably. Messrs. C. J. and R. J. Mann, C. J. Grey, F. Hart, and R. Rex having spoken, Mr. Collins replied on the discussion, stating that he had not claimed any particular originality, and certainly had not merited the expression "sensational" applied to him by Mr. Chatfeild Clarke. He had simply laid down certain elementary principles which every property surveyor should apply, and had pointed out how defects might be remedied at a comparatively trifling expense. The paper would do service, he thought, if it warned surveyors to look at this question from a practical light, and he feared the architectural profession, to which he belonged, was fairly chargeable with some neglect of these matters. If the sanitary engineer had been called into existence as a specialist, it was because his own profession had not proved equal to the occasion. He quite agreed with what had been said with reference to the so-called sanitary protection associations. They recalled to his mind those "Dr. Dulcamaras," whose practice it was to enter the market-places heralded by a fanfare of trumpets, largely advertising themselves as possessing a panacea for all and every mortal ill, which they offered to their victims for the smallest coin of the realm. He quoted, with approval, from a letter by Mr. J. S. Hodgson, of Hexham, in the Building News for January 21st of the present year. It was absurd to suppose that these associations would do more than create a fool's paradise, and he agreed with one of the speakers in the discussion, that their enterprise should be either business or philanthropy. He trusted that the result of his paper would be that members of that Institution would give more consideration to sanitary matters in their every-day dealings with house property, and, in particular, endeavour as far as possible to enlarge the length of leases.

THE CITY OF LONDON SOCIETY OF ARTISTS.

THIS is a society formed for the purpose of holding periodical exhibitions of works in oil, water-colours, and sculpture; and the second exhibition is this year held in the hall of Skinners' Company, Dowgate-hill, Cannon-street. In the water-colour room we notice several highly meritorious works. Over the door is a large effective drawing of Beeches by W. J. Ferguson. Bernard Evans contributes a fine view of "Barmouth, from the Hills above Arthog," in which the distance is cleverly managed. W. E. Green's "Beeches in Sherwood Forest," Alfred Powell's "View at Wensleydale," skilful in the handling of waterfall and foliage; D. Law's mountain piece in Skye (330), noticeable for its atmosphere; J. Jackson Curnock's landscape (341); T. Danby's "Dinas Lake," full of sunlight effect, are particularly fine landscapes. We must also notice two clever studies by P. F. Naftel, M., no less remarkable for the coarse, sugar-papered texture than for the luminous effects imparted by the artist's dexterous dragging of body pigment over the lights. Mrs. E. Hume's "Anxiously Watching," and another piece, are clever figure subjects; and a sunset by W. C. Eddington, M., may be mentioned for its fine, oil-like effect. Carl Haag's "Sphinx of Geezeh" is a skilful study of execution, figures, and luminous colouring; nor can we omit the charming sketch of "Norman Doorway, St. Bees, Cumberland," by W. Harding Smith, and F. Davis's sketch near Chagford, Devon. J. Mogford sends some fresh-looking studies, and Miss C. Montalba a fine study of light and shade (424), and a "Sunset, Venice" (507). J. Powell's "South Downs" (459); J. Steeples' "Common" (408); J. H. Barnes' figure subject, "The Disputed Boundary" (345); the charming study of Primroses by Miss Emily Jackson; C. Cattermole's figure group, "Returned from the Wars," and the fresh, breezy sketch of T. Pyne, will be admired among the numerous drawings. Of the oil paintings, we may draw attention to H. A. Harper's grand rugged Moor (8); H. Caffieri's effective, silvery-toned Beeches (Nos. 19, 211, 203); J. Aumonier's "On the Cliffs, Yorkshire" (31); J. Mogford's fine seascape, excellent in its colour; E. Hayes's breezy subject (64); two truthful figure subjects by W. Dendy Sadler; E. Ellis's effective impressionist pictures (121—147); a vigorous study of J. White; W. B. C. Fyfe's large historic picture, "The Raid of Ruthven;" W. Small's village scene (216), and a fine study of a female head by P. H. Calderon, R.A. The works of A. Hacker (34), and J. Smart (37), are noteworthy. The groups of sculpture by Count Gleichen, "Shy" and "Cheeky," and the large subject (531A), by C. B. Birch, A.R.A., and one or two terra-cotta busts, are interesting. Many well-known painters, besides those we have named, are exhibitors and promoters, and the present exhibition, in the selection of works, is encouraging as an attempt to introduce the quieting influence of art into the midst of a busy city.

LEAD-WORK.

AS the measurement of gutters and flashings varies in some places, we may here give the method usually adopted in London, and described in Mr. John Leaning's new work on "Quantity Surveying," noticed by us last week. In measuring the width, allowance is made for "turning up under slating (usually 9in. from bottom of gutter) and against walls (usually 6in. from bottom of gutter). Allow for 1½in. drips 6in., and for 2in. drips 8in.; for 1½in. rolls 6in., and for 2in. rolls 8in. Assume always that drips are not more than 10ft. apart, as where in longer lengths, there is much risk from expansion and contraction." In speaking of flashings, the author gives 5in. to 6in. as their width. "In these, an allowance must be made for tacks and passings, add 4in. for every 7ft. in length, and 6in. for every angle. This will be found to be practically correct; or allow 3in. every 7ft. in length for passings, and take tacks 6in. by 2in. at distances of 3ft. 6in. apart." Stepped flashings are usually 12in. wide, and the same allowance has to be made as for horizontal flashings. The author observes: "where soakers are specified, instead of stepped flashings, a piece of lead should be taken to each course of slates or tiles, allowing the same lap as the slates or tiles minus 1in., and to course with them, running 4in. under slating or tiling, and turning up 4in. against wall. This gives 8in. by 9in. for each soaker to tiles, and 8in. by 19in. to countess slates. Anything less makes unsound work."

CHIPS.

A Local Government Board inquiry was held on Wednesday week at Luddenden Foot, near Halifax, relative to an application from the local board to borrow £1,500 towards the rebuilding of the bridge. The plans, prepared by Messrs Uttley and Gray, of Halifax, were produced, and it was stated that the total expense would be £3,500, of which £1,500 would be given by the railway company, and £500 raised by subscriptions.

New Church of Ireland schools, and a teacher's residence, have been erected at Howth, from the designs and under the supervision of Mr. Holmes, architect.

It was decided at a vestry meeting held at Abberton, Worcestershire, last week, to rebuild the parish-church, in accordance with plans prepared by Mr. Hopkins, architect.

A stained-glass window, erected at a cost of £600, was opened in St. Andrew's Church, Mildenhall, West Suffolk, on Sunday week.

An oaken lych-gate has been erected at Hawarden churchyard. It was constructed by Messrs. Bailey Brothers, from designs by Mr. Douglas, of Chester.

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NEW HIGH SCHOOL FOR GIRLS AT OXFORD.—THE LATE MR. B. J. TALBERT'S DESIGN FOR THE MANCHESTER TOWN-HALL.—NEW HOUSE AT FARNHAM.—ST. JOHN'S CHURCH, LEEDS.—COTTAGES AT CLAPHAM-PARK.—DESIGN FOR ENTRANCE GATEWAY.

OUR LITHOGRAPHIC ILLUSTRATIONS.

NEW HIGH SCHOOL FOR GIRLS, OXFORD.

The new High School for Girls at Oxford, built by Mr. T. G. Jackson, for the Girls' Public Day School Company, Limited, was opened 23rd September, 1880, when the school was transferred from the temporary premises it had occupied in St. Giles's. The new building stands in St. Giles's-road, East, to the north of Oxford, on land leased from University College, and contains accommodation for about 270 pupils in 11 classrooms, some of which communicate by sliding doors, besides a residence for the mistress, an office and waiting-room, a room for the teachers, cloak-rooms, kitchens, and other necessary offices, and a large hall, 50ft. by 30ft., for the general assembling of the school together and for use on speech-days and other public occasions. The principal front faces St. Giles's-road, and is shown in the accompanying illustration. The great hall occupies the whole of the upper story of the front building with the office and cloak-rooms below it, and the principal entrance in the centre. The class-rooms are all placed in the rear of the building, to secure quiet, and open on each floor into a corridor surrounding the main staircase which occupies the centre of the building. The walls are built of Headington stone in rubble work, with dressings of brick, between which the walling is plastered, and the front is enriched with cornices and pilasters, and a hood over the entrance door, all of terra-cotta. The hinder part of the building is kept studiously simple and plain on account of expense. Behind the school is a large playground, which is provided with an asphalte tennis-court, and is picturesquely shaded with apple-trees, the survivors of an old orchard. The builders were Messrs. Symm and Co., of Oxford; and the terra-cotta was made by Messrs. Doulton, of Lambeth. Mr. E. Long was clerk of works.

THE LATE MR. BRUCE J. TALBERT'S DESIGN FOR THE MANCHESTER TOWN-HALL.

To-day, among our illustrations, we have reproduced Mr. Talbert's drawing of his design for the Manchester Town Hall, and although, of course, all immediate interest in that competition has long since passed away, an illustration of this design cannot fail to be appreciated. We have chosen it from Mr. Talbert's collection of drawings as being about the only strictly architectural design of importance which he has left in a completed form; and, certainly, it is a composition quite worthy of his reputation. We may here also draw attention to the fact that the whole of Mr. Talbert's collection of books and sketches, including several useful studies of old work, will be sold by auction, by Mr. Phillips, of New Bond-street, on Friday next, the 6th inst., as elsewhere advertised, at Mr. Talbert's residence, 5, Euston-square, together with his art furniture, both old as well as new. The old china and other articles of *virtu* will also be on the same occasion offered for sale.

HOUSE AT FARNHAM, AND ST. JOHN'S CHURCH, LEEDS.

The originals from which these two illustrations are taken were also selected from among Mr. Talbert's collection of drawings. The first is an early drawing, by Mr. Eden Nesfield, of a building erected by him, in conjunction with Mr. Norman Shaw, and the interior view shows the interesting church of St. John's, Leeds, as drawn by Mr. Shaw. A geometrical measured drawing of the old rood-screen, seen in Mr. Shaw's view of this church, was published in the Building News for April 30th, 1875. The date of the screen is 1631-4.

COTTAGES AT CLAPHAM-PARK.

This drawing has been admitted into the Exhibition of the Royal Academy this year. The cottages are of red brick, tiled roof, white woodwork, as usual, rough-cast in the gables; but they are not built yet.

NATIONAL SILVER MEDAL DESIGN FOR IRON ENTRANCE-GATES.

This charming design for a handsome pair of wrought and hammered iron entrance-gates, and piers in the same material, with side bays, was awarded a national silver medal in the last public competition held in connection with the Science and Art Department at South Kensington. The author is Mr. W. G. Thomas, student at the Royal Architectural Museum School of Art, Westminster. As a well designed and equally balanced example of decorative ironwork, well suited to its purpose, we commend Mr. Thomas's work. The drawing, perhaps, scarcely does the design justice, but as a practical illustration our sheet leaves no room for complaint.

ARCHÆOLOGICAL.

The Roman Villa near Brading.—The work of exploring the Roman villa near Brading, in the Isle of Wight, is proceeding. The measures taken for protecting the remains from the severe frosts of last winter have been entirely and almost unexpectedly successful. No pains or expense were spared by the explorers (Mr. John E. Price, F.S.A., Mr. F. G. Hilton Price, F.S.A., and Mr. Brabrook, F.S.A.), in covering in effectually the buildings exposed to frost, and the result is that nothing whatever has been injured. With regard to the development of the ground-plan of these extensive buildings, the following further discoveries have been made. The angle of wall erected a few feet to the east of the semicircular structure between the principal room and the hypocaust has been determined to be an external wall of the building, as it is met by the undisturbed soil. The furnace in the wall of the hypocaust has been found in excellent preservation, being an arched passage formed of large tiles with layers of mortar. Several additional rooms, making now altogether 25 in number, have been traced, and the walls excavated. The central space has been determined to have been uncovered by buildings, forming a garden of considerable extent. One of the new chambers excavated has at its south-western corner an apse of 6ft. diameter, and at its north-eastern end a deep pit or well. This seems to have been formed without steining out of the hard sandstone, is about 4ft. in diameter, and has been excavated to a depth of 25ft. At a depth of 14ft. the skeleton of a young person was discovered, which presented in several bones the appearance of severe injury during life. The well or pit yielded a large number of tiles, in perfectly unbroken condition, of various sizes from 8in. to 22in. square. These had probably formed part of the flooring of the room. Many are marked with designs formed by drawing a comb along the surface of the tile when soft or by the fingers of the operators. One tile, 17in. square, after having been elaborately ornamented by a comb along the sides and diagonally across, and then with a circle round the centre, was turned by the workman while still soft on to his right hand, and bears deeply impressed over the elaborate pattern a cast of that hand. Another, one of the 22in. size, was walked over by the naked feet of one workman and the hobnailed sandals of others, and in like manner bears a cast of both feet from the ball of the great toe to that of the heel. The series of coins from Severus (A.D. 222) to Constans (A.D. 350) has been rendered complete by the discovery of one of Magnentius (A.D. 250), who was the only missing Emperor of the series. These conclusively fix the approximate dates of the erection and occupation of the buildings.

Roman Antiquities in Bath City.—A special meeting of subscribers, to appoint a committee, of the fund recently raised for opening-up the Roman remains recently discovered at the baths, was held at Bath on Thursday of last week. Mr. Davis, the city architect, exhibited a plan of the recent discoveries and made the following statement:—A great hall, 68ft. wide by about 120ft., within which is a bath, as far as we have ascertained, complete, have been found at a depth of 13ft. from the surface, extending in length from the western wall of the billiard-room in Abbey-street to within a few feet westward of the eastern wall of the Queen's Bath, and in width from the northern corner of York-street to the southern corner of the late free library. The area above this comprises the whole of the pavement of Abbey-street, No. 6, Abbey-street, the Poor Law offices, Abbey-passage (a length of 68ft.), the present cooling-tank at the baths, with the courtyard adjoining. Piers are now being built beneath the Poor Law offices. The following are the proposed works for opening-up the discoveries:—The removal of No. 6, Abbey-street, and of the soil beneath, as well as of that under the Poor Law offices; the laying bare all the bath, the platform on north side, a portion of the east, and almost the whole of the end of the great hall on the west. It will be necessary to construct arches under the Poor Law offices, for which every facility is promised by the guardians, to build two arches beneath a portion of Abbey-street, to support Abbey-passage by a viaduct from end to end, and to remove the cooling-tank at the baths. A balustrade will be erected in Abbey-street, from which a view in its whole length of the excavation will be seen. An easy access to the original level will be afforded by a flight of stone steps, and also from the bathing establishment, and it is suggested that the ancient bath shall be again filled with the mineral water, not for bathing, but as a cooling-tank. For the balustrade in Abbey-street, he proposes adopting the design originally placed round the King's Bath, and given by Sir Francis Stoner in 1697. The area of the ancient baths is four times that covered by Bath Abbey, and 4,000ft. more than that covered by the Cathedral of St. Paul. A resolution was adopted requesting the city corporation to aid in the work of exploration by permitting the removal of the house No. 6, Abbey-green.

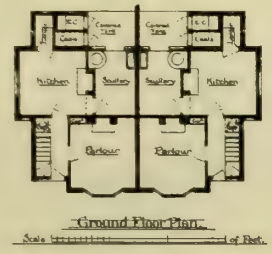
CHIPS.

The eastern triplet of lights in St. James's Church, Staveley, near Kendal, has just been filled with stained glass, by Messrs. Morris and Co., of London. The subjects of the central window are the Ascension and the Crucifixion, and in the side windows are angels holding musical instruments. The figures and subjects were designed by Mr. Burne-Jones.

The chancel of Oving Church, West Sussex, was reopened on Easter Sunday, after restoration from the designs of Mr. Ewan Christian. It contains a number of new stained windows, including a figure of St. Richard on the south side, presented by the late Rev. E. C. Mackenzie Walcott, F.S.A., who held the stall of Oving in Chichester Cathedral. A new roof, holy table, lectern, and other fittings are all worked in oak.

At a vestry meeting held at St. John's, Lowestoft, last week, plans prepared by Mr. J. L. Clemence, architect, of that town, were adopted for the extension of the church by 242 additional sittings.

The contract for making the first section of the proposed Pontypridd, Caerphilly, and Newport Railway has been signed by Mr. John Mackay, railway contractor, and the directors of the company. This section is five miles in length, commencing by a junction with the Taff Vale Railway near Treforest, and extending to the old Rhymney Valley Branch Railway at Nantgarw. It includes a large stone bridge over the river Taff at Treforest, and will cost between £70,000 and £80,000. The work is to be completed in eighteen months.



Ground Floor Plan.

Scale ... of Feet.

DRAWN FINISHED BY
MARK E. ADAMS

A PAIR OF COTTAGES AT CLAPHAM PARK.

Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

DESIGN for the MANCHESTER TOWN HALL by

The late BRUCE J. TALBERT Architect

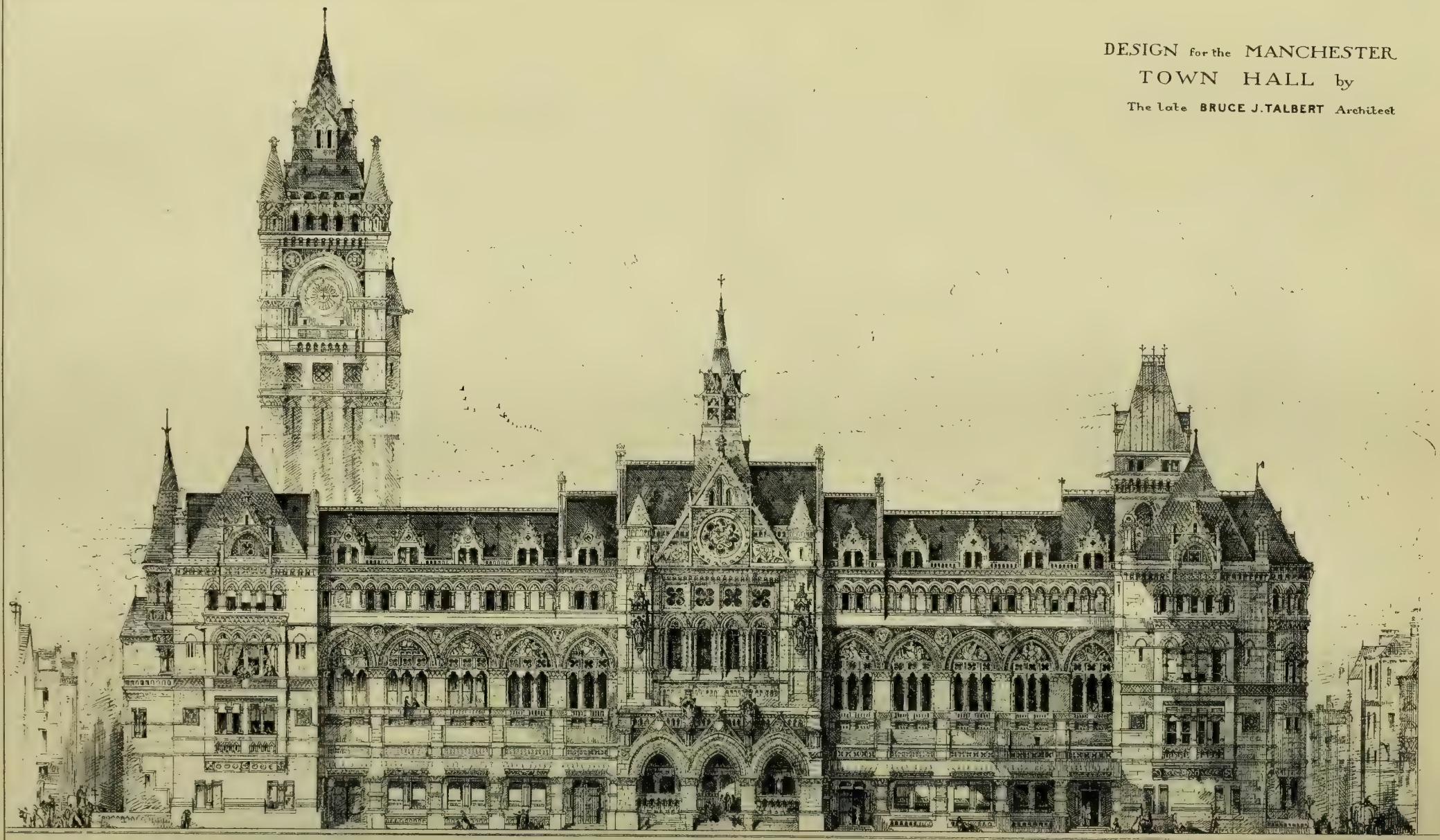
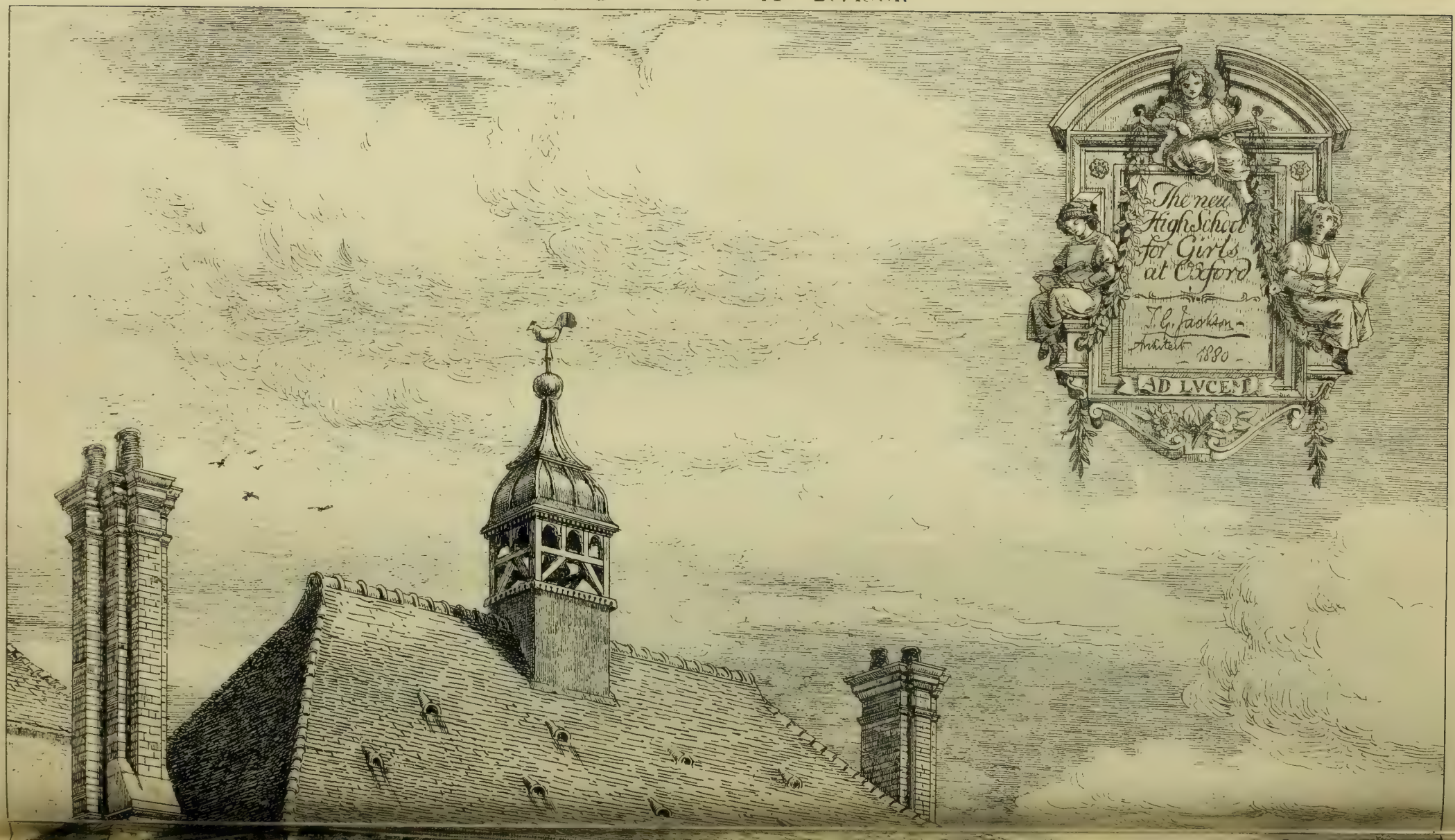
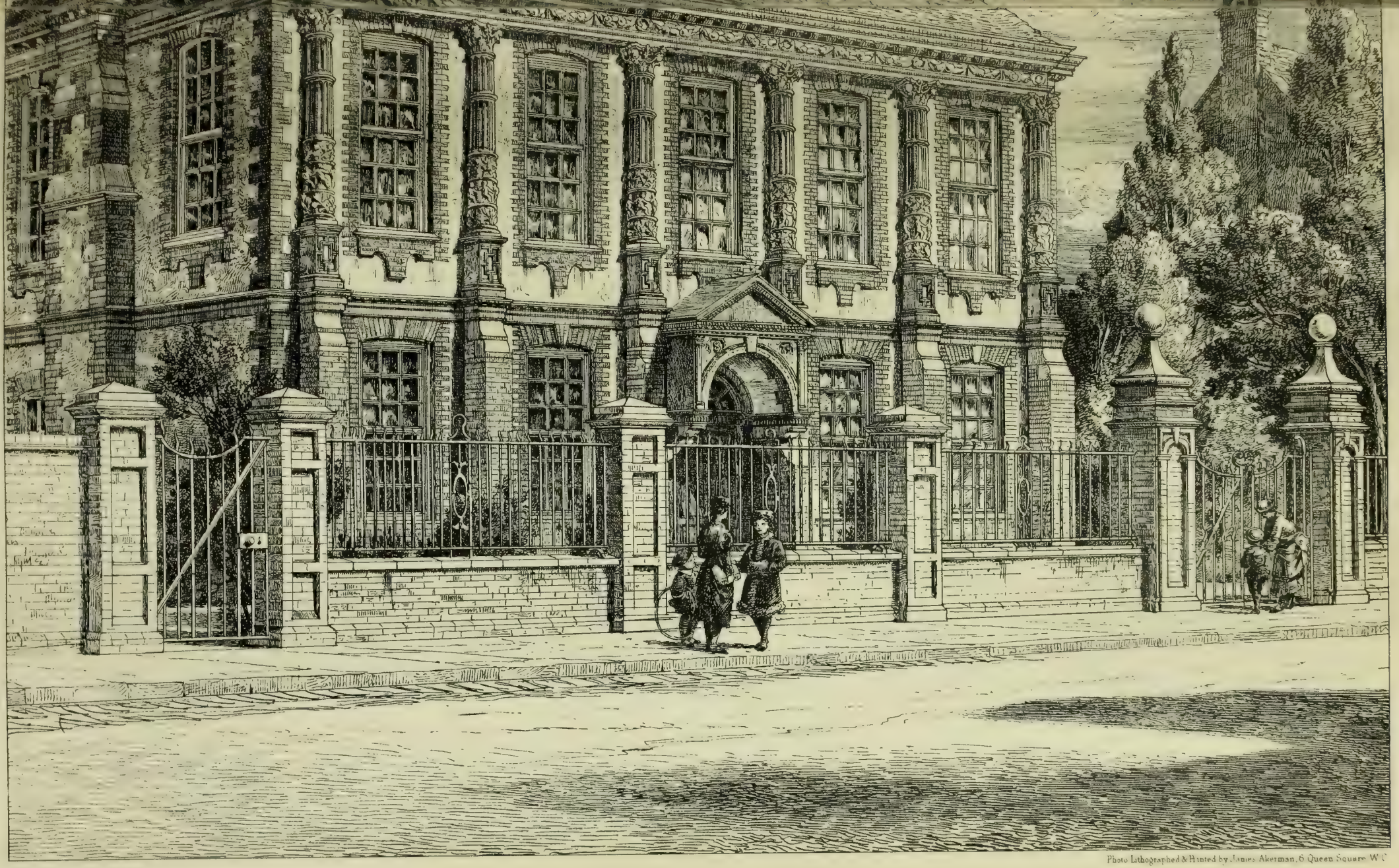


Photo Lithographed & Printed by James Akerman, 6, Queen Square, W.C.


The new
High School
for Girls
at Oxford
T. G. Jackson
Architect
1880
AD LVCEM



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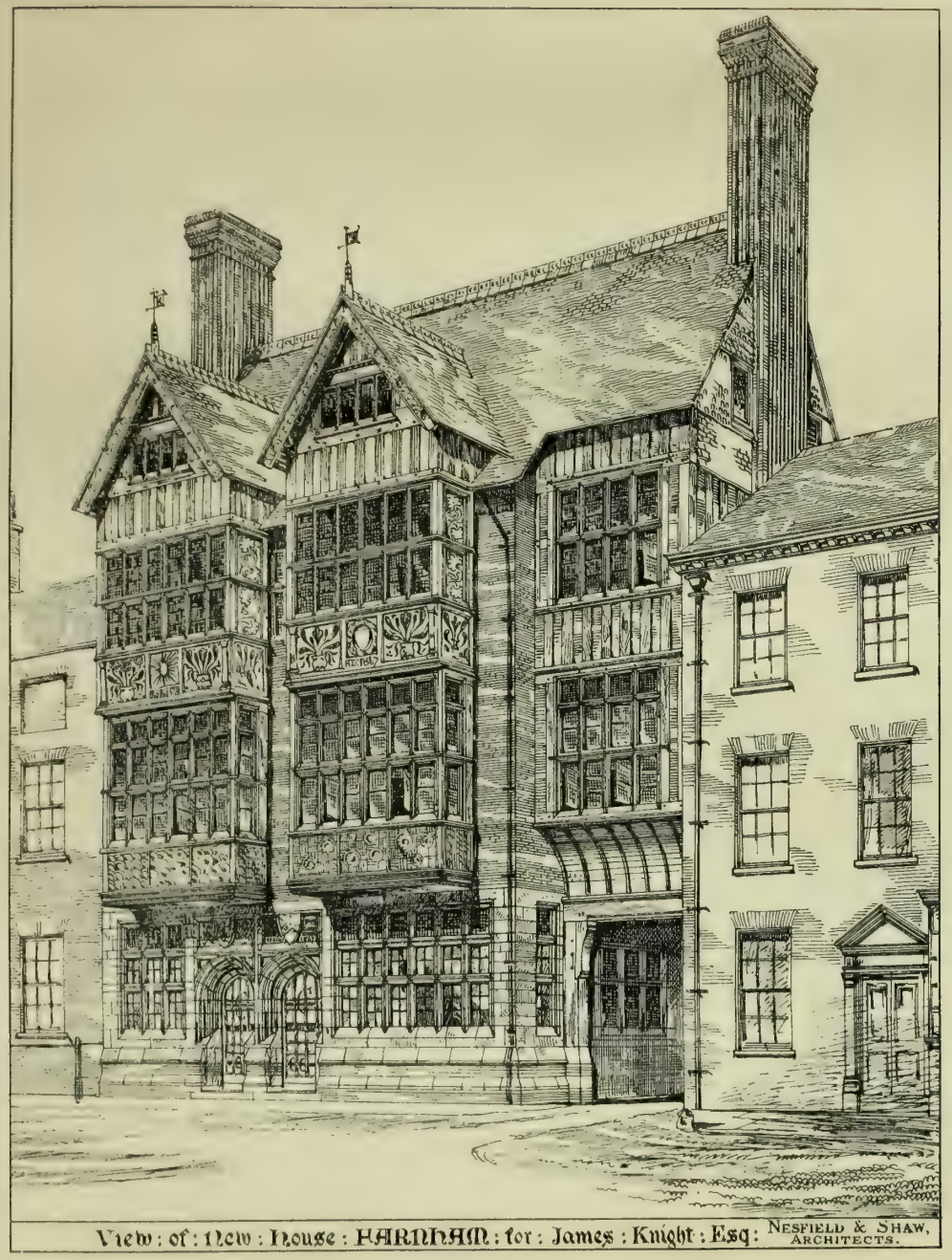
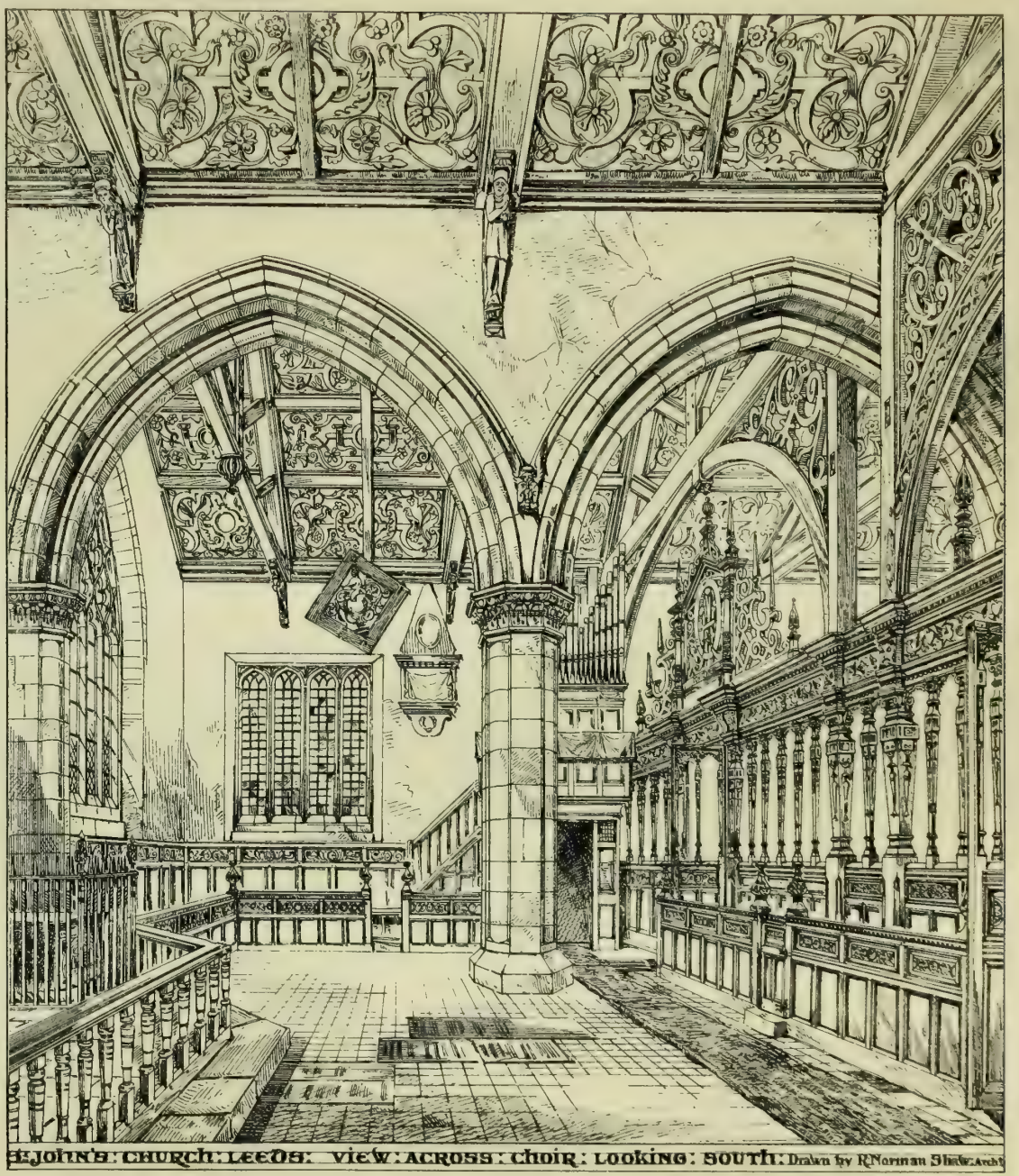


View: of: New: House: HARNHAM: for: James: Knight: Esq: NESFIELD & SHAW, ARCHITECTS.



S: JOHN'S: CHURCH: LEEDS: VIEW: ACROSS: CHOIR: LOOKING: SOUTH: Drawn by R. Norman Shaw, Archt

Photo-Lithographed & Printed by James Akerman, 6 Queen Square W.C.

NATIONAL SILVER MEDAL AWARDED

DESIGN FOR WROUGHT & HAMMERED IRON ENTRANCE GATEWAY

BY W.C.THOMAS 1880
STUDENT·OF·THE·ROYAL·ARCHITECTURAL·MUSEUM
SCHOOL·OF·ART·S.W.

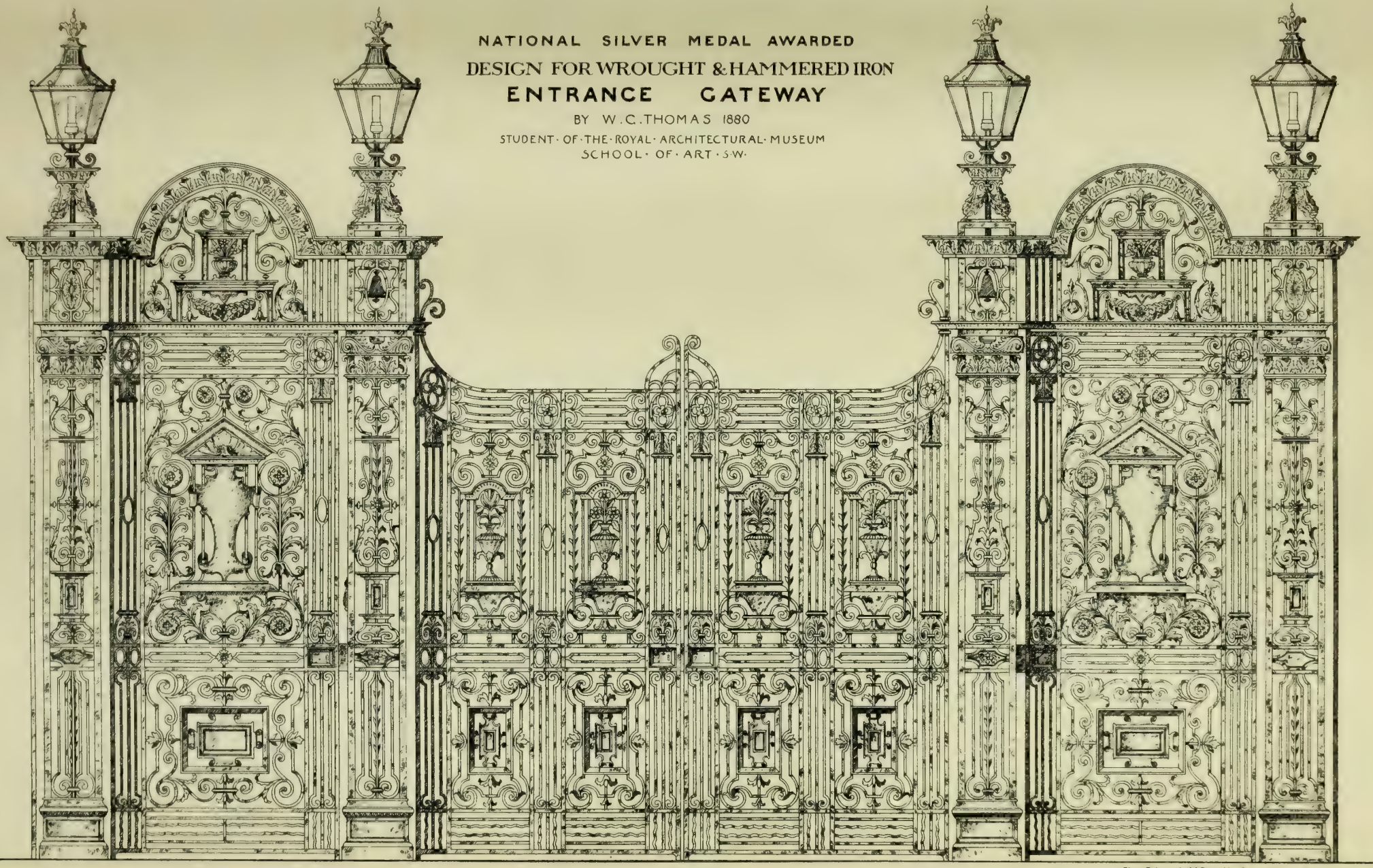


Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

ANNUAL REPORT OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE annual general meeting of the members only of the Institute, will be held on Monday week, at 8 p.m.; the business on the agenda being "to receive and consider the report of the Council as to the state of the property and the affairs of the Institute; to elect the officers for the ensuing twelve months, and to appoint the board of examiners under the Metropolitan Building Act."

NOMINATIONS FOR THE COUNCIL.

The balloting list for the election of Council is as follows:—

PRESIDENT.—One name (out of two) to be returned.—*Horace Jones, V.P.; †George Edmund Street, R.A., F.S.A., P.V.P.

VICE-PRESIDENTS.—Three (out of four) names to be returned.—*Thomas Hayter Lewis, F.S.A., V.P.; *Horace Jones, V.P.; *Ewan Christian, V.P.; *†David Brandon, F.S.A., P.V.P. (in the event of a vacancy).

ORDINARY MEMBERS.—Fifteen (out of 27) names to be returned.—Aitchison, George, B.A; *Blomfield, Arthur William, M.A.; *Brandon, David, F.S.A., P.V.P.; Brooks, James; *Cates, Arthur; *Clarke, Joseph, F.S.A., P.V.P.; *Currey, Henry, P.V.P.; Fowler, Charles; Fowler, James (Louth); *Gibson, John, P.V.P.; Gruning, Edward Augustus; *Hansard, Octavius; *Honeyman, John (Glasgow); *I'Anson, Edward, F.G.S., P.V.P.; *Knowles, James Thomas; Paley, Edward Graham (Lancaster); Porter, Frederick William; Smith, Thomas Roger; St. Aubyn, James Piers; Vulliamy, George, P.V.P.; *Waterhouse, Alfred, A.R.A., P.V.P.; *Worthington, Thomas (Manchester); †Carpenter, Richard Herbert; †Edis, Robert William, F.S.A.; †Seddon, John Pollard; †Spiers, Richard Phené; †Stevenson, John James.

HONORARY SECRETARY.—One name to be returned.—*John Macvicar Anderson, Hon. Secretary.

SECRETARY.—One name to be returned.—*William Henry White, Secretary.

TREASURER.—One name to be returned.—Sir Walter Rockliffe Farquhar, Bart., Hon. Associate.

SOLICITOR.—One name to be returned. — Frederic Ouvry, F.S.A., Hon. Fellow.

AUDITORS.—Two names to be returned.

NOMINATION OF THE BOARD OF EXAMINERS.

The Council have nominated the following to serve on the Board of Examiners for the year of office 1881-82:—

Aitchison, George, B.A.; Blashill, Thomas; Chambers, Francis; Fowler, Charles; I'Anson, Edward, F.G.S.; Jennings, Joseph; Kerr, Robert; Knowles, James, Thomas; Mathews, Joseph Douglass; Porter, Frederick William; Smith, Thomas Roger: Wood, Sancton.

THE REPORT OF THE COUNCIL.

The annual report for 1881 is commenced with a eulogium on the method, determination, and common sense with which Mr. Whichord has discharged the duties attaching to the Presidentship during the two years he has held that office. The deaths of 14 members are announced, viz., Wm. Burges, A.R.A., B. Ferrey, J. H. Hakewill, R. Hesketh and T. H. Wyatt, P.V.P. and hon. sec., Fellows; J. H. Browne and E. M. Forster, Associates; the Marquis Campana de Cavelli, G. J. A. Davioud, Prof. Gropius, H. M. Lefuel, Mariette Pasha and Constantin Thon, hon. and corresponding members, and Rev. R. Burgess, B.D., hon. member. A large increase in the number of subscribing members is reported, the total on May 1st during the past four years being as follows:—1876—Fellows, 329; Associates, 311; Hon. Associates, 70; total, 709. 1879—Fellows, 339; Associates, 341; Hon. Associates, 106; total, 786. 1880—Fellows, 353; Associates, 366; Hon. Associates, 114; total, 833. 1881—Fellows, 365; Associates, 422; Hon. Associates, 117; total, 904. These figures for the present do not include the 83 nominations made on 28th March last, nor the 43 made on Monday last, which, after deducting five transfers from the class of Associates to that of Fellows will, if approved by the Fellows, make a further addition of 121 new members. The council mention, in connection with the accounts, that they have raised the secretary's salary from £400 to £500 per annum, commencing from Christmas last. At the last annual voluntary architectural examination, the examiners and conductors gave their services gratuitously, thereby reducing the expense of conducting it from £98 to £23. The 12th and final voluntary examination will take place in June next, when those who have already passed in one section can present themselves for the other; but all new candidates will be required to pass in both sections. The character of the statutory examination for certificates of competency to perform the duties of district surveyor has also been modified, two sittings of three hours each being substituted in the written examination for one of four hours; and fees are now required from each candidate—two guineas when sending in his application, and a further sum of three guineas on receipt of certificate. No communication on the subject of the conservation of ancient monuments and remains being made to the council, it has not, it is stated, been necessary to summon the committee (a point as to which it will be remembered several questions were put during the discussion on Mr. Stevenson's paper a month since.) The library committee have arranged to open the Institute library free to members of the Architectural Association under 23 years of age and to all *bonâ fide* students of architecture; a loan collection of duplicate books has also been opened, and a considerable increase of readers is reported. The Competitions Committee have presented a report dealing, however, with a part only of the subject, to which two meetings of the approaching Conference are to be devoted. A committee has also been formed to inquire into the question of the law of "light and air," as it affects buildings. It is also reported that the value of the Pugin Travelling Studentship has been increased from £40 to £50 for 1882, and the two subsequent years.

FINANCIAL STATEMENT.

The annual statement of accounts shows, under the ordinary head, a total expenditure of £6,953 11s. 10d., including the sum of £4,320 17s. 4d., on account of premises alterations and total receipts amounting to £6,870 9s., including £1,055 2s., subscriptions to premises alterations, balance carried forward being reduced from £130 7s. 4d. to £47 4s. 6d. The balance-sheet of trust funds shows a total amount of £3,766 5s. 8d., of which £3,263 5s. is invested in securities; a balance of 6s. 1d. on Donaldson testimonial fund remains to balance at debit of revenue account, and £502 14s. 7d. represents cash in treasurer's hands. The balance-sheet of ordinary funds shows, on debit side, £2,758 invested; valuation of books, paintings, furniture, &c., £9,500; subscriptions and arrears, £58 16s.; subscriptions received in advance, £12 12s.; balance at credit of revenue account, £47 4s. 6d. On credit side: By property invested, and books, paintings, furniture, &c., £12,258; subscriptions in arrear, £58 16s.; cash in treasurer's hands, £59 16s. 6d.; the gross totals being £12,376 12s. 6d.

* Members of Existing Council. † Nominated since the publication of the "House-list."

BOOKS RECEIVED.

An Introduction to the Study of Gothic Architecture, by John Henry Parker, C.B. (London and Oxford: Parker and Co.), is the sixth edition of one of the most comprehensive and useful elementary text-books the young architectural student or general reader can consult.——*Accented Four-Figure Logarithms*, arranged and accented by Lowis D'A. Jackson (London: W. H. Allen and Co.), will most materially assist all anxious to secure accuracy in calculation, and insure economy in time and labour. The mode of accentuation adopted by the author is easily acquired and retained.——*The Twenty Styles of Architecture* (London: Sampson Low and Co.) puzzles us somewhat. It is a volume altogether useless to an architect, and must have been written by somebody strangely unfamiliar with his subject. The classification of the "twenty" styles—they might as easily have been extended to twenty dozen—is very funny; we make acquaintance for the first time with "Parisian," "Jesuit," and "Ultra-Classic," and we further find that "we ought not to imitate Classic, but take up some Gothic waif of our own and train it up till it reaches a Classic standard." What all this means, or why the book ever saw daylight, we fail to perceive. We must add, in justice to the publishers, that everything on their part has been done to make the book a good one.——*The Earl of Beaconsfield; a Biographical Memoir*, by Edward Walford, M.A. (London: F. Warne and Co.), will have its passing interest. In a cheap work of the kind it seems hardly necessary to have occupied whole pages with an abstract of the Reform Bill of 1867, and similar matter, unless to fill up the space.

Building Intelligence.

BURTON-ON-TRENT.—St. Margaret's Church, Shobnall-street, was consecrated on the 9th inst. It is of the 13th-century style of Gothic architecture of the French type, and is built entirely of brick, except the nave piers and a few constructive features, which are in Ancaster stone. It consists of a nave 89ft. by 24ft. 6in.; north and south aisles 8ft. wide each in clear, and chancel with semicircular apse 22ft. 6in. in length, and same width as nave; and a vestry on either side of chancel. Both the chancel and nave are 41ft. to the wall plate, and 51ft. to the apex of the interior roof; the exterior height of the church to the ridge is 62ft. 6in. Nothing is added to the constructional features beyond a massive bell turret, corbelled out from the west gable, and surmounted by a stone cross at a height of 81ft. above the pavement, and an iron cross at apex of eastern apse. The aisles are without side windows, but are lit above by a continuous series of dormer windows, and are roofed in as lean-tos against the nave walls. The nave and chancel are lighted in the clerestory stage by seventeen lancet windows. The chancel is raised five steps above the nave, and is floored with black-and-white marble in 12in. quares. The nave floor is entirely of wood blocks laid upon concrete. The roof of the nave and chancel is of pitch-pine, waggon-shaped, and divided by ribs. The whole of the timber is pitch-pine, with the exception of the choir stalls in the chancel, which are of oak. The benches will accommodate five hundred and forty adults by measurement (including the choir). The five chancel windows are filled with stained glass by Messrs. Burlison and Grylls, of London, and below the windows the arcading is filled with a series of painted panels, executed by the same firm, illustrative of the Te Deum. The lectern, copied from a design by Sir Christopher Wren, has been executed by Messrs. Hart, Son, and Peard, of London, the other furniture of the church having been supplied by Messrs. Jones and Willis, of Birmingham. The heating is by hot water, a novelty in the arrangements being the warming of the upper stratum of air by means of pipes carried upon the wall plates of the nave roof, the upright flow and return being at each end of the building; this contract has been carried out by Mr. F. Knight, of Burton. The total cost of the church is £7,500, and the Sunday schools now in course of erection at the back of the church will cost another £2,000. Mr. Reginald Churchill, of Burton, was the architect, and Mr. E. H. Cogswell clerk of works. Messrs. Lowe and Sons, of Union-street, were the general contractors. Mr. J. Roddis, of Birmingham, has executed the whole of the carving in wood and stone.

CANTERBURY.—A new College (St Mary's) is about to be erected at Hale's-place, Canterbury, by the French Jesuits, who have recently purchased that fine mansion and grounds in the parish of St. Stephen's. The buildings will consist of two blocks, one on the east the other on the west of the mansion. Each block will cover an area of about 3,000 square yards, and will consist of a community wing with numerous sitting and study rooms; dining-hall, 63ft. by 25ft.; two refectories, each 40ft. by 26ft.; two studies, 42ft. by 29ft, chemical laboratory 40ft. by 26ft.; twelve class-rooms, each about 26ft. by 20ft., and ten music class-rooms. The dormitories will be situated on the second-floor, covering the whole of the college and dining-hall. The buildings are to be three stories high, each story 16ft. from floor to ceiling. The exhibition hall adjoins the college, and will have iron roof principals covered with 1½in. pitch-pine boards, varnished; the floor will be laid with wood pavement, "Burnett's Process." A stage will be erected at the east end, and a gallery at the west. The floor-joists throughout the buildings will be supported on wrought-iron girders, floor-boards pitch-pine. Cement floors to corridors and passages. Special attention has been paid to drainage, ventilation, and heating. The internal doors, fittings, staircases, &c., will be pitch-pine varnished. The buildings will be of a very substantial character, and similar in design to the present mansion. The Rev. R. Vaughan, S.J., Liverpool, has prepared the plans, under whose supervision the work will be carried out, and Mr. John L. Ward, builder, of

Upper Brook-street, Manchester, is the contractor.

Incorporated Church Building Society.—The Society for the Enlargement, Building, and Repairing of Churches and Chapels has made grants of money in aid of rebuilding the churches at Charfield, near Gloucester, £800 and at Kemberton, near Shiffnal, Salop, £100; enlarging or otherwise improving the accommodation in the church of Kington, near Worcester, £30. Under the circumstances of the Church of St. Matthew, Tipton, Staffordshire, being made wholly free, the grant made towards building the church was increased from £100 to £150. A grant was also made from the special mission building fund towards building a mission church at Wick, in the parish of Leominster.

Ipswich.—The new post office and school-board offices, which occupy the site of the late corn exchange, have just been completed, and are being brought into use. The building is built from a uniform design, but the Government and municipal portions are separated by a party wall, the post office being divided into two floors, and the school-board offices into three floors. The style is columnar and astylar Italian. The Cornhill and King-street fronts are entirely of Portland stone, the south and east sides, abutting upon the old Herb Market, being of white brick with Portland stone dressings, in harmony with the other fronts. The front elevation, that to the Cornhill, has a projecting portico supported by eight columns, arranged in pairs, Roman Doric in character with Greek treatment. This portico is surmounted by four sitting figures, 6ft. in height, representing Industry, Electricity, Steam, and Commerce. Industry has a beehive by her side, and holds a distaff. Electricity is not the "angel spurning a gas retort," as suggested to the architect by a witty town councillor, but is represented by a female figure grasping the lightning; upon her head is a crown of wings with electric points. Steam rests upon a steam cylinder and piston, and is crowned with laurel. Commerce is represented with the caduceus of Mercury, wears a castellated crown, and holds in her hand a wreath of oak. Surmounting the pilasters is a carving of the Royal arms, surmounted by two recumbent figures of "Genius" and "Science." The keystones of windows in the first floor are also carved, and there is a considerable amount of carving in frieze, jambs, sills, and heads, and panels. The public post-office is 39ft. long by 25ft. wide and 15ft. in height, and is shut off by a panelled screen from a sorting office, 25ft. by 24ft., and beyond is an inner sorting room, 42ft. long by 25ft. in width. These rooms, and the post-office generally, will be warmed by hot-water pipes supplied from one of Rivers' patent boilers in the basement, and also by fireplaces, in which will be placed Wharncliffe stoves. In the inner sorting room Waygood's patent lift will be used for the transference of letters to an upper sorting room. The municipal offices occupy the south part of site, and are planned as three floors of four offices each, with lavatories, &c., in each floor, and in the basement is cellarage. Mr. John Johnson, of 9, Queen Victoria-street, E.C., is the architect, his plans having been selected by Mr. Chas. Barry, in 1879, in competition with twenty-two others; and Messrs. D. C. Jones and Co., Cromwell-road, Gloucester, are the contractors. The sculpture has been executed by Mr. F. W. Woodington, son of Mr. Woodington, A.R.A., and the carving by Mr. Baird, of London, from the architect's designs; Mr. G. J. Farrow, who is now engaged in a similar capacity in the Ipswich New Corn Exchange buildings, has acted as clerk of works; and Mr. Norman was the builders' foreman. The asphalting work was done by Mr. Benj. Brooker, of Ipswich. The cost has been about £10,000.

Leeds.—The consecration of the new church of St. Martin's, Potternewton, Leeds, took place on Tuesday week. The edifice has been erected at a cost of £6,500—from the designs and under the superintendence of Messrs. Adams and Kelly, architects, Imperial Buildings, Leeds. Accommodation is provided for 700 people. The style is Decorated Gothic. The plan comprises a cloistered nave, with north and south aisles, and chancel, having vestries and organ-chamber on the north side. The church throughout is built of stone from the Potternewton quarries, the dressings being of sandstone. Internally the walls are plastered, and will be tinted in distemper. The contractors for the work are—Stonework, Messrs. Franks and Evans; joiners, Messrs. Marsh, Jones, and Cribb: slaters, Messrs. Watson and Worsnop; plumber and glazier, Mr. J. E. Bedford; plasterer, Mr. R. Brunton; ironfounders, Messrs. Nelson & Sons; painters, Messrs. Hemingway, all of Leeds. The pulpit and reredos is the work of Mr. J. Throp, carver, Leeds, from the architect's design.

Sheepwash, Devon.—The parish-church was reopened on the 21st inst., after undergoing a thorough restoration at the hands of the late Mr. J. F. Gould, architect, of Barnstaple, who practically finished the work just before his lamented decease, and whose last work it was. The reconstruction of this church, with the exception of the upper portion of the tower, has been completed. Of the original church nothing remains of any archæological interest. In the new building the general lines of the old walls are adhered to except that the chancel is extended 3ft. to eastward, and a transept has been added to north side of chancel. The tower at the west end, on the site of the original one, is now carried up two stages, slightly above the level of the ridge of the nave. Mr. Gould's design shows another stage with compact belfry-windows, and a saddle-back roof with coped east and west gables, side gables, with single-light louvred windows, and wrought-iron finial. The new building has been designed in the spirit of the style prevailing about the latter part of the 13th century. It consists of nave (about 33ft. by 22ft.), with western tower and south entrance 7ft. square, transept 22ft. by 16ft. with north transept, now used as a vestry. The walls are built of local stone, with massive buttresses, quoins, copings, label-mouldings, weatherings, window, and other dressings of Hatherliegh stone, the interior being plastered, leaving the stone dressings to arches, doors, and windows exposed. The aisle and chancel floors are paved with Messrs. Maw & Co.'s tiles. The chancel fittings, pulpit, lectern, altar-table, and other fittings are all oak, the framing being of Memel wainscot, and the panels of old oak from the original building. The original contract was taken by a builder, who was unable to carry it out, and the completion of the work was then intrusted to the clerk of the works, Mr. Charles Oatway, of Barnstaple, who also superintended the renovation of Petrockstow Church, another of Mr. Gould's restorations. On the previous day to the reopening ceremony, in the presence of the Building Committee, Mr. Oatway received at the hands of Lord Clinton a very handsome and valuable present, consisting of a pair of silver mugs and claret-jug, as a private gift from his lordship in recognition of his services.

Standlake, Oxon.—The parish-church of the Holy Cross at Standlake, four miles from Witney, was reopened on Easter Sunday, after completion of first section of a restoration. The post-Reformation pews have been cleared out as well as an unsightly modern roof. The clerestory walls have been rebuilt, and a new roof of English oak has been erected over the nave. It is enriched by hammer-beam full-length angels, bearing shields emblazoned with the emblems of the Passion. The seating is all of oak; a unique feature in the nave bench-ends is the series of sculptured figures representing the calendar of the English Church. This is stated to be the first time since the Reformation that such a work has been introduced into any Established church in England. The virgin saints are placed upon the north side, and the male ones upon the south. They all turn, more or less, towards the east, and each rests upon the splayed base of the bench-end. The name of each saint appears upon a scroll. The carvings are all full-length figures. The nave avenue and approaches to the chancel are laid with encaustic tiles, and the floors under the seating is of oak blocks, placed in herring-bone pattern. The font is of Bath stone. The arcades have been restored where necessary. The general contractors were Messrs. Barnes and Son, of Witney. The sculpture and the wood and stone carving, including a memorial pulpit of English oak, are by Mr. Harry Hems, of Exeter, and the whole restoration has been carried out from the designs and under the supervision of the architect, Mr. Clapton C. Rolfe, of Reading. The cost of the works just executed in the nave is about £2,000.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

British Archæological Association.—The tenth meeting of the session was held on Wednesday week, Mr. Cecil Brent, F.S.A., in the chair. The Rev. Dr. Hooppell reported the discovery of a Saxon incised slab at St. Andrew's Church, Auckland, and of a carving of an infant. Mr. C. Lyman, described the remarkable series of interments now being uncovered at Stapenhill, Burton-on-Trent. More than twenty interments have been met with, lying in various directions, of both sexes, some of the bones indicating men of tall stature. The discovery is attracting considerable attention in the locality, but the period of the burials had not been decided. The sketches of one or two urns which have been found were shown, and were pronounced to be of Saxon date, but it is probable that some of the burials are of an earlier period, since flint instruments have been found. The others date probably from Pagan Saxon times. The site is the summit of high ground commanding a capital view. Mr. Loftus Brock, F.S.A., called attention to the public work which has now been carried on for many years by the Duke of Wellington at Silchester, and detailed the nature of some of the recent excavations there. A room has recently been uncovered, the paved floor of which rests on a series of flue-tiles for heating, laid close together under the whole surface. Mr. Walter Myers, F.S.A., exhibited a large collection of bronze implements of pre-historic and Roman date, acquired by him in Austria. They exhibit several interesting departures from well-known types. Mr. C. Sherborne, described a series of playing-cards of 15th-century date, and exhibited fac-similes. The first paper was by Mr. Maunde Thompson, F.S.A., and was descriptive of two remarkable manuscripts of the 14th century in the possession of the Rev. Dr. Grinsley, and hitherto unedited. They form portions of Apocryphal Gospels, and render the Legend of the Holy Rood, the History of Judas, the Story of Simon Magus, the Conversion of Tiberias, and the like. The second paper was by Mr. H. Syer Cuming, F.S.A. (Scot.), and was read in his absence by Mr. W. de Gray Birch, F.R.S.L., and was descriptive of two seals of early date of the Knights Templars. The author referred to the fact that the order was in existence long after the usual date stated for its suppression; and indeed, quite on to recent years.

Edinburgh Architectural Association.—The president, Mr. J. M'Lachlan, Mr. Brodie, R.S.A., and a large number of the members of the Edinburgh Architectural Association visited St Giles's Cathedral on Saturday, under the guidance of Mr. William Hay, the architect of the restorations. Commencing with the nave, Mr. Hay stated that this, with three bays of the present choir, were the oldest portions of the existing building; that the church, which was mentioned in history as early as 854, had been succeeded by one built by Alexander II. in 1120. This building was destroyed in the burning of the city by Richard II. in 1385. All that remained of King Alexander's building was a finely-sculptured Norman doorway, which formed the entrance to a porch on the north side of the nave until 1791, when it was demolished during some alterations then made. This porch was figured in Dr. William Chambers' work on St. Giles's, and was a very beautiful example of the architecture of the period. The older portion of the present edifice was built in 1387. This included the nave, the central tower, three bays of the present choir, and five chapels on the south of the nave aisle, to which were added shortly afterwards five other chapels on the northern side. Of the former only three remain, and of the latter only one, the rest having been entirely demolished to suit the formal plan to which the building was reduced by Mr. Burn in 1829. The remaining chapel on the north side was that known as the Albany Chapel, built by Robert, Duke of Albany, second son of King Robert II., in expiation of his share in the murder of his nephew David, Duke of Rothesay, in 1402. The central pillar of the chapel has on its peculiarly sculptured capital two shields bearing the arms of Albany and those of the Earl of Douglas, who was concerned with him in the crime. On one of the imposts is a shield with a cross moulin, or miller's cross, so called because it is a representation of the iron cross which in very ancient, and

also in modern, mills is the usual support of the upper mill-stone, the square in the centre representing the aperture for the spindle. As the form of the cross was therefore always present, it was supposed to be a protection against the thievish practices of dishonest millers. It was hence termed the Cross of Justice, and was the adopted arms of the College of Justice. It was difficult, Mr. Hay said, to account for its connection with the Albany aisle. It may have been introduced as an heraldic satire on the absence of justice in the escape of the noble founders of the chapel. The nave had no clerestory before 1829, but had a stone vaulted roof, which was then taken down to make way for the present lath-and-plaster ceiling. The pillars of the nave were originally massive octagons. They were considered very obstructive in the Old Tolbooth Church by those of the congregation who were thereby deprived of a view of the minister. Some had caused huge slices to be carved out of the sides of the pillars here and there, to improve lines of vision. The pillars so mutilated must have had a rather irregular effect until reduced to their present more slender proportions. The party next visited the choir, the Preston aisle, the remains of the southern chapels, where the late restorations have been made with such good effect by the liberality of Dr. William Chambers. After an examination of the various objects of interest in the newly-restored portions, a vote of thanks was given to Mr. Hay for his interesting account of the edifice.

COMPETITIONS.

Colne, Lancashire.—A new Baptist chapel and schools are about to be erected from the designs of Mr. George Baines, architect, Accrington, whose plans have been selected in competition with Messrs. Paull and Bonella, London and Manchester; Mr. Brearley, Liverpool; and Mr. Watson, Burnley. The buildings are estimated to cost £6,000, exclusive of movable furniture.

PARLIAMENTARY NOTES.

Metropolitan Water Supply.—Mr. Ritchie asked on Monday when there was any likelihood of a Bill on this subject being introduced (laughter). Sir W. Harcourt.—When the Bill with reference to land in Ireland is passed, I shall be in a better position to answer the question of the hon. member.

Proposed Monument to the late Lord Beaconsfield.—Lord R. Grosvenor gave notice that on Monday fortnight the right honourable gentleman at the head of the Government would move for a committee of the whole house to consider a humble address to her Majesty, praying her to cause steps to be taken for the erection of a monument at the public expense in Westminster Abbey to the late Earl of Beaconsfield

CHIPS.

At a vestry meeting of the parishioners of St. Oswald, Chester, held last week, it was agreed to accept £4,500 for relinquishing all parochial rights in the south-west transept of the Cathedral as the parish-church of St. Oswald. Of this sum, £1,000 will be expended by the Ecclesiastical Commissioners on the restoration of the transept, £1,500 towards enlarging St. Thomas's Church, without the walls, and the remainder for providing church accommodation within the walls.

St. John's Church, Farncombe, West Surrey, was reopened on Easter Sunday, after the erection of new organ by Messrs. Bishop and Son, London, the lowering of pulpit, addition of brass lectern, and Communion-rail, and covering of the walls of Communion-inclosure with Minton's tiles. Mr. C. Forster Hayward, of London, was the architect, and designed the tiles and organ-case, which is of pitch-pine, and the decorations upon the organ-pipes.

An inquest was held at West Hartlepool, on Wednesday week, on the body of William Evans, architect, of London, who died in a police-cell that morning. A verdict was returned in accordance with medical testimony that death resulted from inflammation, accelerated by exposure to cold and excessive drinking.

The Norwich Board of Guardians have received three tenders for strengthening the floor of the workhouse, amounting respectively to £124 10s., £135, and £139. As the surveyor's estimate was only £75, they have been referred to a committee for consideration; the names of the builders did not transpire.

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THE PRESIDENCY OF THE INSTITUTE.

To the Editor of the Building News.

Sir,—The principle involved in this contest may be very important, and the absurdity of some of the by-laws has been made sufficiently obvious; but, beyond this, it seems a matter of no great moment whether Mr. Street or Mr. Horace Jones be elected to the Presidential chair. The chair of the Royal Academy has more than once been filled, and ably filled, by men remarkable for their social qualifications rather than their pre-eminence in art.

I, for one, however, hail with satisfaction these dissensions, as a sign that the Institute, as a body, is awaking from its long sleep, and that a spirit of reform is rife which may lead to the entire renovation of an effete constitution.

The Council may shut its eyes—may altogether be ignorant of the fact—but it is a fact nevertheless, that for the Royal Institute of British Architects there exists amongst many, even of its own members, a feeling strongly akin to contempt, and chiefly for this reason, that membership is not a matter of honour or merit, but simply one of two or four guineas per annum. Many men belong to it from no feeling of professional pride, or *esprit-de-corps*, but simply because it goes down with the public, and answers their purpose from a business point of view. And with all its elaborate machinery, the Society is little more than a society of *dilettanti*, powerless to cope with the difficulties and dangers that harass the profession.

Now a body with a charter of incorporation and a Royal prefix should have a higher claim to confidence than this, and it seems astonishing that such an—I will not call it—incubus should have been endured so long, and that the whole of the profession has not by this time successfully agitated for a change. But of one thing we may be sure: reform must be the result of external pressure; it will never be initiated by the "powers that be" in Conduit-street. More than one Presidential address has deplored the existing evils; but I can not call to mind one that has even suggested a radical cure.

The architects' preserves being poached upon increasingly by house-agents, jerry builders, and *id genus omne*, who have brought infinite discredit upon the whole guild, a degree or diploma such as is conferred upon all other professional men, becomes, every day, more and more a necessity. Why, indeed, should the qualifications of an architect be taken for granted without examination? You can not, it is true, make the profession a "close" one in the literal sense of the word; you can not prevent any quack so disposed from dubbing himself "architect and surveyor," but you can make it a real honour, a real test of competency and even merit, to belong to the Institute, and not as now, a mere question of an annual subscription. You can make her the Alma Mater of the profession, and you can draw a hard and fast line between those within her pale and the poachers who usurp her legitimate functions.

A revision of the charter and by-laws seems imperatively required on this basis:—

1. An examination, compulsory upon all future candidates for membership without exception, the examinations to be held periodically, and substantial prizes or exhibitions to be given in connection therewith.

2. The powers of the new council to be enlarged with a view to the authoritative settlement of vexed questions such as competitions, quantities, &c., and also with a view to the more complete recognition of its authority by the public and the law-courts.

3. All members (not honorary) to have a voice in the general management, *i.e.*, a vote at the general meetings, the relative value of a Fellow's and an Associate's vote being a matter of detail.

In instituting a diploma for all new members the question at once arises, What about the present members? That it seems is not an insuperable difficulty. You cannot ask men advancing in life and established in practice—to say nothing of the many distinguished members—to submit themselves to a technical examination, but you can give all the present Fellows and Associates above a fixed age the diploma according to their grade. In fixing the exact age at which to draw the line no doubt some little injustice would be done to a few, but the mischief would be so small that this difficulty may be at once dismissed.

Again, some of those entitled by present membership to the diploma might voluntary submit to, or even desire, examination. And some special recognition or incentive might be held out to this class.

The voluntary examination instituted nearly twenty years since is admittedly a failure. And the compulsory examination for associates only, which comes into operation next year, is perhaps doomed to even more ignominy, and for this reason—that young men will not submit themselves to an ordeal without there is a specific degree to be won, and when they know that by efflux of time—by waiting a few years—they can attain to the fellowship without passing any examination at all.

But I repeat that reform must be the result of external pressure: the existing council may enlarge its premises, and make countless honorary associates, but it will never voluntarily reform itself. The governing power seems to be in the hands of a clique—individually, no doubt, men without fear and without reproach. And the charter is conceived in such an illiberal spirit that the 422 Associates—a body numerically larger than the Fellows—have no voice in the management, and no power of interference.

Reform appears absolutely necessary for the welfare of the profession, if only those capable of leading it successfully would take the matter up.—I am, &c.,

April 27th. F. Stone.

Sir,—In common with very many other members of the profession, I cannot but deprecate the letter of Mr. T. Roger Smith in your issue of 8th inst., as not only setting forth views on the question of architectural examination which Mr. Street has in no way himself expressed, but with which he cannot be in any way supposed to agree by those who know how sedulously he has striven for the higher education of architectural students, and in every way in his power to promote the advancement of the profession. I am quite at a loss to understand how Mr. Smith can assume that Mr. Street is unfavourable to any scheme of architectural examination, when it must be known that he has all his life done all in his power to promote the better education of architectural students, not only at the Royal Academy, but in every other way in his power, as more especially evinced by his published works and the admirable series of lectures lately delivered by him, as Professor of Architecture, at the Royal Academy, and I am quite sure that Mr. Street, if elected, is much too loyal a gentleman to do anything which would interfere with or hinder the existing arrangements as regards the examination scheme; but would, on the contrary, be much more likely to promote its efficient working, and assist in making it of practical and permament value to the profession at large.—I am, &c.,

Robert W. Edis, F.S.A.

14, Fitzroy-square, W., April 21.

Sir,—The facts I stated last week may I hope have removed a good deal of misconception as to the real nature of By-law 26. In connection with its working on the present occasion, there is another point which seems to be either imperfectly understood or else persistently misrepresented.

Much has been said about Mr. Jones's courteous offer to withdraw in favour of Mr. Street and of that gentleman's neglect to avail himself of it. It is singular that it should have escaped the notice of Mr. Jones and his supporters that so far as any possible action of the Council in Mr. Street's favour is concerned, that offer was a mere form of words, without any practical meaning or value under the present By-laws. Had Mr. Jones actually withdrawn, and had Mr. Street expressed the strongest possible wish to stand in his place, the Council could not have nominated him, however unanimous they might have been in their desire to do so. They would have been compelled by By-law 26 to nominate Mr. Christian, the next Vice-President. It is clear, therefore, that to give effect to Mr. Jones's offer (dictated, no doubt, by a generous feeling for which everyone must give him credit) the only course possible under existing rules was precisely that which has in fact been pursued under the provisions of By-law 30, which, unless it is intended to be applied in a case of this kind, must be considered a dead letter and a sham. According to provisions of that By-law, Mr. Street has been nominated by two Fellows, the nomination being accompanied by a written undertaking from him to serve if elected. Such an undertaking is as nearly the expression of a wish to be elected as can fairly be expected of Mr. Street in his position, and it now only remains for Mr. Jones to prove the bona fides of his offer by withdrawing in his favour.—Yours, &c,,

Arthur Blomfield.

6, Montagu-place, Montagu-square, London, W., April 26.

BARINGS' BANK.

Sir,—After all the discussion that has passed, the matter lies in a nutshell.

On the one hand, it is certainly to be regretted that the owners of the Bank did not place sufficient funds with the architect to enable him to put up a building equal in costliness and splendour to those whose company it is in; and secondly, that Mr. Norman Shaw, even if only as a matter of policy, should not have given it the maximum dignity and grandeur possible, with the restrictions he had to work under, and to the style he so favours, instead of endowing it with such equivocal features as must greatly divide opinions respecting it.

On the other hand, it is equally sad to see valuable stone and skill thrown away on another reproduction of the eternal Corinthian columns, especially when used for such a false office as appearing to support a cornice that would stand as well without them.

But progress and the exercise of originality and individual effort, even when mistakes are made, are better than puerile imitation; but Mr. Shaw, if he wishes to make his style something more than a passing fashion, must endeavour to give us something which will appeal to the public spontaneously as something more beautiful than what has gone before, and not less so.

That his taste, however, still wants some correcting is evident from the east elevation of the new buildings in Knightsbridge, which is one gigantic flat wall, apparently crushing the little Lowther Lodge adjoining; and that in some of his works their only claim to beauty is in being built of red brick instead of yellow.

For his efforts to introduce a little picturesqueness amidst the insipid monotony of most of our streets, the people of London must, however, still be greatly indebted to him; and if he and other architects will only bear in mind that progress on what has already been developed, as well as the bringing to bear of personal taste and talent, are the essentials of true architecture, the so-called Modern Gothic, Queen Anne, and even Renaissance motives may help finally to evolve a true National Victorian style.—I am, &c., Evacustes.

Sir,—It is not my wish to prolong unnecessarily the discussion on Barings' Bank; but as Mr. J. M. Brydon, in your last issue, has entered into a somewhat detailed refutation of my remarks on that building, I may be pardoned for replying thereto.

On reading Mr. Brydon's criticism of the three buildings to which I directed attention, it occurred to me that perhaps I had looked at Barings' Bank with jaundiced eyes, and so I made another visit, bringing to bear the utmost good-nature of which I am capable: the result being that I must express deeply the manner in which I am flattered by those opinions of Mr. Brydon which are exactly opposite to mine, and must thank him for considering me "ignorant" and the author of "nonsense"; had he agreed more than he has with my views, they would by this time have lost much of the opinion of accuracy which I now entertain for them. Were I able to prove (which I am not) that Mr. Brydon possessed the general acumen necessary for criticism, it would not in any way alter the buildings under notice, which stand, fortunately, for any person's study; but it may be useful to consider their merits and demerits from the point of one who is not ignorant, and who does not write nonsense.

With reference to Barings' Bank, Mr. Brydon has discovered, *inter alia*, that it is "well marked from the adjoining houses by pilasters; that it has a cornice perfectly in keeping with the rest of the work; that the windows are, though plain, generally well proportioned, and give quite a character to the work; that he always thought mouldings over window-heads were to protect them from the weather; that he has been behind the scenes (or rather wall), and knows why the principal entrance is low and wide; that he always thought something about attributes of architecture; that I am a self-constituted critic; that the window in the broken pediment is charmingly treated; that he marks how the designer has taken care that all the most exposed parts shall be in the more durable material; and that because of the absence of two swags, there is conclusive proof in this building that there has been a want of funds."

I will take the above discoveries in their order and analyse them. Thus what Mr. Brydon terms *pilasters* do not in this case happen to be pilasters; a cornice as full of enrichment as it well can be, surely is out of harmony in a facade meagre in the extreme in other parts; there is, therefore, a loss of symmetry and balance, and a want of appreciation of the value of proportionate disposition of ornament, apart from the "want of funds."

I challenge any person who possesses the very slightest knowledge of proportion to do anything but utterly condemn as most displeasing and ugly the ground-floor windows of this bank, and the manner in which they have been divided into small squares only adds to the general unsightliness; but I agree that they give character to the work. It is this very character that I have been from the first endeavouring to criticise. Mr. Brydon's opinions on label mouldings accord, I believe, with elementary truths; but "want of funds" might have kept them away from the first-floor windows, as they have been from those of the ground-floor; and this brings us to the principal entrance.

I trust that Mr. Brydon is the only clever and sensible critic who thinks that I ever seriously thought that this entrance "led to stables"; but if it is so low and wide "because of the walls of the old passage and floor-level behind it," I apologise for my remarks thereon, and now I understand why several Queen Anne entrances I have seen are equally low and wide. The lowness and the wideness, however, are not all that I have to say about this entrance, but its entire incongruity with the rest of the façade, its general unsatisfactory effect, its badly-curved broken pediment, its finicking details in juxtaposition with extreme plainness, its general and unmitigated ugliness because wanting in the true principles of architecture, viz., reason, symmetry, unity, proportion, and beauty.

Mr. Brydon's conclusions as regards "attributes of architecture," although not profound, are obviously correct, and, as I am a "self-constituted critic," I suppose he has been constituted by the State. I never heard of him before this as an authority on architecture, but that is my misfortune; the loss is mine, and, when he speaks with admiration of a "broken pediment," I cannot say that I regret my ignorance of him as a critic. I know his school. I could write the history of the formation of his architectural opinions from the words "broken pediment" only. His "Mark how the designer, &c.," is a very pretty flight of imagination; but, as stone is the material employed to arrive at this wonderful "fitness for its purpose," it does not, to my mind, accord with "want of funds."

The National Provincial Bank of England requires no defence of mine. Mr. Brydon's unacquaintance with the true principles of architecture has led him into the "carping and prejudiced" spirit with which he has spoken of that building; and, all I will say in reply to him is, that it is not a fault that the building is "almost monumental," that the architect must not be blamed because the "columns produce a good effect"; that if he (Mr. Brydon) considers the proportion of the ground-floor windows of Baring's Bank good, he cannot hope to appreciate the well-proportioned windows of the National; that it may have been a cold day when he saw "the statues look thin against the skyline"; that statues should be analogous to the character of the order—in this case Corinthian, and, therefore, delicate; and that, when architects require and design figures to stand in full relief isolated, they do not build attics behind them. These latter remarks Mr. Brydon might make a note of, as he may find them useful in sculpture criticism.

But, if an utter inability to appreciate true art in Classic design, and modelling it to the exigencies of a bank, so as to adequately represent the wealth and position in the City of London of an eminent firm, is too plainly observable in Mr. Brydon's remarks on the National Provincial, what is to be said of his diatribe on "Crosby House"? I venture to assert, Sir, without fear of contradiction by any architect acquainted with Gothic Art, that Crosby House is a splendid specimen of Street Gothic. The picturesqueness of its composition, its exquisite and graceful proportions, its well-balanced fenestration, its carefully-dispositioned and thoughtful ornamentation, its delicate and charming detail, its happy skyline, all contribute to that unostentatious, respectable, and reasonable art, which some architects cannot, or will not, understand.—I am, &c.,

Wm. Woodward.

SOANE MEDALLION DESIGN FOR A COUNTY-COURT.

Sir,—Permit me to offer a few remarks upon the successful design for the Soane Medallion, which you illustrate in the Building News for last Friday. I will confine my remarks to the planning. The design of elevations may, to a certain extent, be a matter of taste, but there can be no question about a good arrangement; moreover, you have already alluded to the general style of the elevations in your article of the 4th March, when you say, "We can hardly congratulate the competitors for this prize on the result of their labours," and I think most of your readers will agree that Mr. Conder has won his laurels very easily. I would just mention the growing practice of omitting the

chimneys in elevations when they do not improve the appearance. The practice ought to be discountenanced by the Institute.

The judge's entrance seems to me too prominent and public—it would have been better at the side. No lavatories or cloakrooms are provided for registrar, clerks, or bailiffs. This seems a serious omission. No lavatory accommodation for the general public is shown on either floor, and I agree with you that the corridor arrangement is doubtful. In the internal arrangement of the court on the first floor the position of the box for witnesses is bad: they would have to cross the court every time from their retiring-rooms, and as there is no barrier to separate the court proper from the public space, in a crowded court this might be a work of some difficulty, and would cause loss of time and confusion. No place is provided for the reporters. It is usual, and always advisable, to have two rows of seats round the table, in order that the solicitors can have their clerks, &c., close at hand, without actually being at the table. The space provided for the solicitors seems small for a large town, and a robing-room for them on the first floor would have been an advantage.—I am, &c. D. M.

COMPETITIONS.

Sir,—A new phase has developed itself in connection with the above already malodorous subject.

Designs for a new church at Macclesfield were recently advertised for; and, in reply to applications for particulars, the following circular was issued some three or four weeks afterwards:—

Christ Church, Macclesfield, 16th April, 1881.

Sir,—I hereby acknowledge the receipt of your favour which, with many other applications, was laid before the Building Committee in due course at the last meeting, when the following resolution was passed, of which I was requested to send you a copy.

"That the thanks of the Committee be presented to the several gentlemen who have replied to the Advertisement for Plans, and that they be respectfully informed that the Committee regret that owing to pecuniary and other circumstances, they do not find themselves at present in a position to forward the requisite particulars for the preparation of plans, of which, when required, due notice will be sent."

Regretting that I was unable to reply to your letter earlier, I am, Sir, yours faithfully,

James Johnson, Hon. Sec.

Is this yet another of the many instances of the well-known unbusiness-like habits of the clergy; the lack of unity and faith amongst religionists; a job, or what?—I am, &c.,

F.

SEWER VENTILATION AND EXTERNAL SOIL-PIPES.

Sir,—My reason for troubling you again is the same as that which actuated Mr. J. P. Seddon in his letter in your columns, dated 26th January, 1876, viz., lest others might imagine that the objections Mr. Buchan advances should have weight in disparaging a system which is considered so generally to have conferred a practical boon upon the public. Mr. Seddon went on to say, "Mr. Buchan knows nothing of what he has taken no trouble to examine, and jumps at erroneous conclusions." Mr. J. P. Seddon so expressed himself in answer to a letter of Mr. Buchan's, in your issue of 21st January, 1876, and almost every sentence in it, and Mr. Buchan's letter in your last, satisfy me that he really does not understand the subject he so often writes to you upon. I don't wish to even seem rude to Mr. Buchan; but if I were either reticent or generous, after all that he has stated, I feel sure he would not properly appreciate my motive; and I express myself as I have done simply that he may not further misunderstand me.

In his last he refers to some conversation which he says Major Seddon told him had passed between the Major and myself about traps to bath, &c. First, I have no remembrance whatever of any such conversation, and further, what I have stated in my last letters on the subject is, I should think, sufficient on the point; but Mr. Buchan complains of my want of candour about it.

In a former letter of Mr. Buchan's he said, "in Mr. Banner's specification, the usual lead siphon traps are dispensed with, and the fact of such being shown or done in conjunction with the air-inlet and ventilator, justifies Mr. Banner's patent." By this Mr. Buchan's meaning is clear, but he has omitted to state accurately the actual wording of my specifications.

In that of 1872, No. 2,303, it is this: "Owing to the complete seal afforded by the use of the above-described apparatus, I am enabled to dispense with the use of D-traps to the closets which are generally placed beneath the pan in all ordinary closets to act as a seal between the closet and the soil-pipe, and which are very liable to generate gases by the impossibility of keeping them free from impure matter."

In that of 1875, No. 2,401, "From the above description it will be seen that a current of fresh air will continuously flow into the lower end of the soil-pipe at the inlet, and be drawn up to and discharged at the top of this pipe by means of the ventilating cowl, whilst at the same time the communication between the soil-pipe and the drain, cesspool, or sewer is cut off by the valve or water-seal of the trap. It will consequently be unnecessary to provide the several closets each with a separate trap below the basin.

The "description" consists of any trap so constructed as to well flush the outlet at each discharge, an air inlet entering the soil-pipe just above the trap, and a ventilating cowl of any form on the top of the soil-pipe. The basins, pans, or valves of water-closets may be of any ordinary construction.

Mr. Buchan will notice, what I have not the least doubt he already knows, that the traps referred to "in my specifications" are the traps which always were, and which so generally still are, placed beneath the closets, of whatever description, and not in the waste-pipes of baths or sinks.

The wording of my pamphlet will no doubt be given by Mr. Buchan, as his excuse for troubling you and me in the way he has. He is not the only person who, for the sake of writing, I have fancied, has written in the same sense; but as the points referred to are non-essential, I really have avoided hitherto troubling you with any reply thereto, considering it abundantly clear from all I have before stated, that there should be a trap at the foot of each soil-pipe from closets above the basement. And this really is what I intended by the expression in my pamphlet, "One trap suffices for the whole house," and practically this is so, for in the very great majority of houses there are neither baths nor housemaids' sinks.

I am sorry if the expression in my pamphlet has really misled anyone; when I wrote it, I had in my mind my own house only, and not a large mansion or a hospital; at Guy's, some of the lead pipes and sinks had been in use over 100 years, and no one, probably, knows better than Mr. Buchan himself that such or similar circumstances would justify and require variations in practice in unimportant details.

Let me add, my house consists of seventeen rooms and the usual offices; the closets and soil-pipes (not by my choice) are in the middle of the house. One closet and lavatory is on the dining-room floor, another on the half-landing between the drawing-room and bedroom floors. The bath is on the bedroom floor; the only trap in it (the house) is in a cupboard on the basement, and there is no trap to the bath or lavatory waste, both of which are led into the soil-pipe, and no one has ever detected an unpleasant smell at either, or at the inlet, and many have tried to do so very earnestly and severely. If Mr. Buchan still disbelieves, he may come and try whenever he pleases. The inlet is a 1⅝in. pipe, led between the dining-room floor and the ceiling of housekeeper's-room; the outlet and cowl above roof is 2½in.; the soil-pipe proper is 4in.

A few words about traps. Neither the lever-trap nor the double dip-trap—properly placed—can with fair usage be unsiphoned. I have never heard of the water in either being frozen. The weight of a trap is unimportant if it acts efficiently. Excreta should not be exposed even for a moment.

The Honeyman trap is an open gully-trap, and so little thought of at the time that provisional protection only was obtained for it. The objections to it are as great and as numerous as they are, in my opinion, to every other outside gully-trap. I am aware that the grating above them can be covered over, as Mr. Buchan says, and the inlet made somewhere else—no doubt, and they had best always be so. The larger the gratings are the worse they are in every way; and if the gratings are covered up, then the traps cease to be either Buchan's or the Edinburgh air-chambered, or the Honeyman traps, and they become more defective than common siphon-traps.

To return to the system as applied to my own house, it has been in use since 1874. The trap—a lever trap— has never had the least repair or alteration, and it is one of the first three made. A fuller and most accurate description of the whole system will be found in your own issue of 14th January, 1876, in the *Architect* of 15th January, 1876, and the *Builder*, 11th December, 1875.

The basement rooms are about 9ft. 6in. high; dining-room floor, 13ft.; drawing-room floor, 13ft.; bed-room floor, 10ft.; upper bedroom floor, 9ft.

The cistern is above the skylight over the well stair-case.

The system is not one which can be properly judged only by a person trained to understand it, like a patent lock, the key of which is always missing: it is so simple that a practical plumber's apprentice can understand it.

I submit it would be a great misfortune if the system from which such important results may flow should be jeopardised by a pretended disagreement about perfectly unimportant details, which fair discussion and unbiased consideration ought easily to enable us to remove, whoever may be justly entitled to the credit of having introduced it.—I am, &c., Edwd. W. Banner.

11, Billiter-square, E.C., April 26.

[We can spare no more space for a continuation of this controversy.—Ed.]

ARCHITECTS AND SANITATION.

Sir,—Thirty years since the writer of this letter made a determined effort to enlist the sympathies of the public generally, and of architects more especially, in favour of an important branch of sanitary science. The improvements advocated were prefaced by the text: "Ventilation is essential to health, and no system of warming should be tolerated which fails to afford a plentiful supply of fresh air to, and the withdrawal of vitiated air from, each and every inhabited apartment."

The comparatively small success which has attended the effort referred to may possibly be accepted by many architects and builders as conclusive evidence that the improvements advocated are not needed, or, at the least, are not imperatively called for. Unfortunately for progress, it rarely falls to the lot of house-constructors to hear the uncomplimentary remarks of occupants; these are usually made to third parties, called in to rectify faults or supply omissions in buildings after their erection, when Time, "the avenger," has entered his protest.

While the public, on the one hand, complain that the designers of houses have failed to suggest ventilation, and in many cases have even deprecated its consideration, architects, on the contrary, protest that their clients either "don't care for it" or "object to pay for it," and so the question is hopelessly shelved. In private residences this result is disappointing enough to those who appreciate good ventilation. *They* know that the evils of stuffy and unwholesome atmospheres in living and sleeping-rooms are too frequently submitted to, because neither architects nor clients, and certainly no speculative builders, will give themselves the trouble to investigate their causes and cure, or, better still in all new buildings, their prevention.

But when neglect of ventilation has occurred in the erection of public buildings, or rooms constructed to receive large numbers of persons, the evil results are much more evident, and the cost of rectification very serious. Some notable examples might be quoted in the otherwise beautiful and successful buildings of some of our first architects, but to name them would be invidious.

The profession of an architect has hitherto been so little safe-guarded, that it probably exhibits a greater disparity of culture among its members than is to be found in any other; hence it may be asserted, without offence to those who are truly efficient, that not a few architects are disqualified to advise upon this and kindred questions of a scientific character. To this fact may be attributed the temporary adoption of many inventions and so-called improvements, which carry upon their very faces their own condemnation.

These remarks are made as introductory to a statement of the *objects* of the Museum of Building and Sanitary Appliances, the *causes* for its present enlargement, and the *motives* for constructing the new portion, viz., No. 19, Maddox-street, upon a plan differing materially from that usually adopted in London houses.

First. The object of the proprietor has been that of gathering together under one management specimens of all sanitary manufactures and contrivances, together with building appliances which can be deemed interesting to architects, their clients, and others.

Second. The causes for the enlargement of the Museum are simply the steady growth of its attractions, and the impossibility of finding space sufficient in the original galleries, for the many new appliances sent for exhibition.

Third. The motives which have guided the erection of the new building, No. 19, Maddox-street, are prompted by an earnest desire to illustrate practically certain simple propositions for increased salubrity in house-construction. However far the effort may fall short of the necessity of the case, it will, it is to be hoped, excite interest and discussion, and promote the objects which the proprietor has at heart.

The special arrangements in the new building to which attention is particularly invited are as follow:—

1st. The provision of a fresh-air chamber in the sub-basement, in which the air for the supply of the several rooms is filtered and washed.

2nd. An upcast fresh-air channel to each room

for the delivery of the purified air; warm in winter, cool in summer.

3rd. The extraction of the vitiated air of each room, at all seasons, by upcast flues.

4th. Improved arrangements for warming, by means of grates of all kinds, hot water, &c.

5th. Efficient arrangements for carrying off all bad odours at their sources, and the prevention of their diffusion within the building.

6th. Effectual ventilation of the house-drains, soil-pipes, and public sewer, whereby all pressure of sewer air is prevented.

7th. Facility for the personal examination of every foot of house-drain, usually buried beneath the basement floor, but in this house fully exposed to view.

To these attractions, which are special to the building itself, must be added the large number of building and sanitary appliances, before referred to, on permanent exhibition.

Much might be written upon each of the above seven subdivisions of this question of warming and ventilation, but consideration for your valuable space must curtail this paper.

There are, however, two points underlying the whole question of successful ventilation which urgently demand authoritative settlement, viz., the proper positions in inhabited rooms for the introduction of fresh air, and, correlatively, for the extraction of vitiated air.

While some authorities (Charles Hood, F.R.S; E.A. Parkes, M.D., F.R.S.,&c.) advocate the admission of fresh air, moderately warmed in cold weather, at the lowest practicable level to avoid floor or carpet dust, and the extraction of the vitiated air at the highest level, or as nearly thereto as circumstances will permit, others (Douglas Galton, C.B., F.R.S., &c.) contend for the admission of the fresh air at a high level, even at the highest, through the room cornice, thence to descend, acquiring warmth by contact with the ceiling and wall-faces, and mixing with the heated air of the room, to escape by the ordinary open fire.

There is yet a third view, of American importation, which deprecates the introduction of fresh warmed air in toto, and advocates the warming of the air of the room by radiation or convection from steam or hot-water pipes, and the supply of cold air, at all seasons, directed, Tobin-fashion, upwards without draught!

The views of the writer of this paper are strongly in favour of the first-mentioned mode of admission and extraction. It seems to him entirely erroneous to permit the admixture of descending fresh air with the impurities of respiration, products of combustion from artificial lighting, &c., to be again inhaled, though in a diluted form, on its passage downwards towards the open fire and chimney.

Further, such a principle of ventilation is opposed to the modern demands for economy of fuel by slow combustion, smoke consumption, &c., which should reduce draught, and thus avoid loss of heat and smoke by the open chimney.

The writer has not yet had opportunity of witnessing the practical application of the third alternative above referred to, which, however, is of too recent introduction to admit of an authoritative judgment. But when the introducer of the system enforces its superior advantages by reference to the exhilarating effect of cold, even frosty, air upon those capable of enjoying it, it does seem to the writer that he overlooks the fact, that both the young and aged, and too many even in mid-life, are strictly enjoined to avoid exposure to cold air, even to the extent of seeking a warmer climate in winter than that to which we are accustomed.

D. O. Boyd.

The Museum of Building and Sanitary Appliances, 19 and 23, Maddox-street, Regent-street, W. (in connection with the Architectural Societies' House, 9, Conduit-street, W)

Boring operations for salt have just been brought to a satisfactory close at Saltholme, near Port Clarence, Middlesbrough, by Messrs. Bell Bros. The bed was discovered in 1854, but Messrs. Bolckow, Vaughan, and Co., after expending about £45,000, failed to make it a commercial success. A contract has now been let to Mr. Wild, and a 12in. bore has been driven by a Beaumont diamond rock drill to a depth of 1,043ft. 7in., when the salt, which is stated to be 100ft. thick, was reached. It is proposed to put down an inner tube, through which fresh water will be poured, to be pumped up as brine in the larger boring.

Memorial-stones were laid on Tuesday week at Denton Holme, Carlisle, of a new Primitive Methodist Sunday-school. The building is Gothic in style, is to be of brick, and seated with open benches for 220 scholars. Mr. Joseph Shields, of Durham, is the architect, and the chief contract, that for masonry and brickwork, has been taken by Mr. J. Hutton, Carlisle.

The Brighton town council last week instructed the borough surveyor to prepare plans and specifications for a proposed sanitorium.

Intercommunication.

QUESTIONS.

[6484.]—**Concrete.**—I shall be glad of information as to the best sort of machinery for making compressed concrete blocks and slabs, both moulded and plain.—G.

[6485.]—**Grand Hotel, Paris.**—I shall be glad if any of your readers can furnish me with the dimensions, especially the height of the dining-room, at the Grand Hotel in Paris.—E. J. R.

[6486.]—**Conisborough Castle.**—In some architectural publication like the "Association Sketch-Book," there appeared a plate of a sketch and details of the chapel in the keep of this castle. A reference to where this is to be found would oblige.—A. S. E.

[6487.]—**Valuations.**—Will any reader kindly inform me of the best published work on the "Valuation of all Kinds of Property," showing the best method of framing together reports for placing before a committee? Any information on this subject will be gratefully esteemed by —Young Valuer.

[6488.]—**Pebble-Dashing.**—Could anyone inform me where the small pebbles used for "pebble-dashing" the exterior walls of buildings, can be obtained, and the approximate cost of same per ton? Also how many yards will a ton cover, and, if possible, to explain the modus operandi of "pebble-dashing" on a surface of Portland cement.—Lancashire.

[6489.]—**Examinations in Building Line and Architecture.**—I should feel greatly obliged if any of my fellow-readers would kindly instruct me in my following difficulty:—Having been an articled pupil to a firm of builders and architects for four years, I wish to know if there are any examinations I could go in for, by which I would be able to gain some distinction or degree without attending a science and art school, as I have a great wish to gain some distinction in the above trade or profession?—Builder and Architect.

[6490.]—**Lincolnshire.**—I intend having a ten days' sketching trip in this county, excepting Lincoln and Boston. Would some reader suggest places worth architecturally visiting?—A R.I.B.A.

[6491.]—**Cathedrals.**—I hope shortly to visit the following cathedrals: Bangor, Chester, Lincoln, Lichfield, and Southwell Minster, and would be obliged to any readers of the Building News if they would impart to me such information and points of interest to be observed as would tend to make my visit the more satisfactory, and also kindly to enumerate the surrounding objects near at hand worth visiting?—Young Architect.

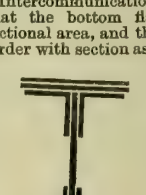
REPLIES.

[6428.]—**Oak Fittings.**—The blue stains "B." refers to are probably caused by the stuff not being thoroughly dry. Oak invariably "blues" after the tool when it is not seasoned. A solution of oxalic acid and hot water will remove this. Of course, it gives the wood a bleached appearance, not at all desirable when near the eye, but in a roof it is right enough. Ugly old nail hole stains in roof timbers are always offensive looking eye-sores. A repeated application of oxalic acid will remove them in toto.—Harry Hems.

[6457.]—**Constants.**—In the question and reply, "Dodson" should have been "Dobson." In the reply to No. 6427, "Mr. Packett" should have been "Mr. Puckett."—Hugh McLachlan.

[6459.]—**English Cathedrals.**—I believe the best work on the subject is Britton's "Cathedral Antiquities," or "English Cathedrals," 5 vols., with 311 plates. It is a rare and expensive work, but is to be found in first-class art libraries. There is also another work which I have not seen, published 1814-19, Storer's "History and Antiquities of the Cathedral Churches of Great Britain," 4 vols., having upwards of 250 plates. Separate works on York Cathedral have been issued by Britton, Poole, and Hughall, and others. Also, I believe, works on Exeter Cathedral.—Hugh McLachlan.

[6462.]—**Floor 40ft. Span.**—The best method of carrying this is by wrought-iron plate girders placed beneath the floor, so that the joists may have a bearing on the upper flanges. Allowing six girders in the total length, taking 2ft. 10in. as the depth and 12in. as the width of flanges, the floor joists will have a bearing of 9ft. 2in. The total weight of floor, calculating 1¼cwt. per ft. super., is 175 tons, or 25 tons to each girder. Then calculating, according to my reply to No. 6424 in the "Intercommunication" of the 1st inst., it will be found that the bottom flange should have 14·7 sq. inches sectional area, and the top flange 18·375in. Therefore a girder with section as sketch, and of the following dimensions, would suffice: Two top plates of 12in. by ⅝in. each, two upper angles 5in. by 5in. by ⅝in., web ⅝in. thick, two lower flanges 4½in. by 4½in. by ⅝in., and bottom plate 12in. by ⅝in. With these girders it would be advisable to have two or three vertical angle stiffening pieces on each side of small section. The floor could also be carried by trussed wooden girders, but it would not be so satisfactory for several reasons. The girders might be made of less depth than taken if more iron would be required. Also box girders might be used, and part of the girders concealed in the flooring, the joists being carried by horizontal bearing angles.—Hugh McLachlan.



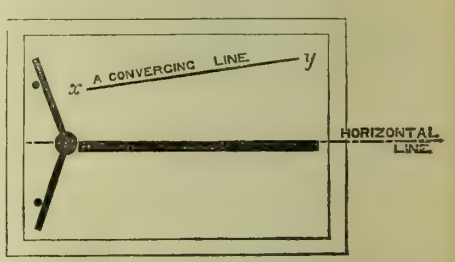
[6463.]—**Cubing Workhouse.**—Per cube foot at 7d., if cost of building in neighbourhood is about the same as that in London. Add 1d. per foot extra for the administrative buildings and hospital.—Hugh McLachlan.

[6467.]—**Lime in Well.**—Chloride of calcium would probably have the effect mentioned. In so short a time it may have been made by the action of the lime on some of the components in the water or at the well bottom.—Hugh McLachlan.

[6472.]—**Plain Tile Roofing.**—I should be glad to have some further particulars of actual experience of tiles in an exposed situation. "Surveyor" says pitch a long way on the acute side of square pitch, but the square pitch is very commonly employed. See Mr. Norman Shaw's work at Bedford-park, Lowther Lodge, and Marcus Stone's house at Kensington, &c. How are the tiles laid in these instances? In the case of rafters having tiles bedded in mortar, and lath and plastering on the inside as finishing to an attic room, is it possible to provide ventilation for the underside of tiles? Is there any advantage in bedding in mortar? Is there any in "torching" or pointing underside? What is the size and thickness of oak split laths necessary? What is the best form for galvanised iron hooks, and are they better than nibs, nails, or pegs? Do the tiles require neither holes nor nibs if hooks are employed? I am about to use tiles in a very exposed situation overhanging the sea-coast. The pitch of the roof is about 50°, or 5° steeper than the pitch that gives a right angle at the ridge, and I shall be much obliged for any results of experience bearing on these points. If Mr. Norman Shaw would state the mode of fixing adopted by him he would confer a boon upon his profession and upon—Gobo.

[6473.]—**R.I.B.A. Examinations.**—The last voluntary proficiency examination will take place in June next, and all applications must be sent in on or before the 30th inst., as stated in R.I.B.A. advertisement in your issue of the 1st inst. If "C. E. M." and others were to write to Mr. W. H. White, Secretary, 9, Conduit street, London, W., for a copy of the rules and questions for last examination, enclosing 1s. 6d., they would obtain far more useful information than can be given in any reply through your "Intercommunication" columns. The age of candidates varies from 21 to 30 years. I expect the syllabus mentioned by "C. E. M." is simply the application form which is sent gratis. Next year the compulsory examination for membership will commence.—Hugh McLachlan.

[6475.]—**Advantages of Centrolineads.**—I occasionally observe inquiries about the use of this simple instrument, to which no one seems to take the trouble to reply. In No. 6475, of April 15, "O." asks what is the advantage of using one? It saves the inconvenience of a distant vanishing-point, and a long straight edge to reach it. A drawing, no matter how distant the vanishing point may be, can all be worked within the compass of any moderate-sized drawing board that will hold the paper it is on. Consequently, the board can be moved about, put aside, and work resumed at any time without any anxiety of mind about disturbance of points and position of board. For example, I have often carried a large-sized perspective drawing in course of drawing about with me, on a small board, the size of the sheet of paper, into town in the morning, home in the evenings, working at it at odd times anywhere, on any table, as opportunity arose. How to set a centrolinead? asks one after another of your intercommunicators. Nothing easier. Use rule of thumb and don't bother about the science of the thing, and a minute or two adjusts it simply as often as you want it. Vide diagram. Mark first on your



drawing the horizontal line, and any one converging line, $x - y$, tending to the distant point required. Stick the two pins for the arms to work against in the board as above by guesswork, say, about equidistant above and below the horizontal line. Lay the straight edge along the horizontal line and the arms against the pins, screwing them up tight. Move the straight edge up to the converging line, $x\,y$ (of course working the arms against the pins). If the straight edge does not coincide with the converging line come back to the horizontal line and unscrew and readjust the arms for another trial, and, in fact, dodge them at a more or less obtuse angle, until the straight edge accommodates itself to both your converging lines. Then fire away. I find I often hit off the proper angle of the arms at first shot, at most times in two essays, and always in three. Every centrolinead works either right hand or left by reversing the arms. If the side of the straight edge is not opposite the central eye when beginning to work, unscrew the arms and turn them over. Two centrolineads at one drawing are never practically wanted. There are usually a far-off and near-hand vanishing-point. A pin stuck within the compass of the board usually serves for the near one.—T. D.

[6475.]—**Advantages of Centrolineads.**—It should be mentioned that two centrolineads are necessary if meant to work both from right and left hands, as a right-handed centrolinead is no use when the vanishing-point is on the left.—Hugh McLachlan.

[6476.]—**Book on Painter and Decorators' Work.**—Davidson's "House-Painting, Graining, Marbling, and Sign-Writing, a Practical Manual of," crown, 8vo., cloth, 5s. This I find in Batsford's catalogue for 1878; have no acquaintance with the work.—Hugh McLachlan.

[6478.]—**Etching.**—Obtain Hamerton's admirable "Etcher's Hand-Book," price 5s., published by Roberson, 99, Long Acre, from whom may also be obtained all etching requisites. There is also the larger and costly work by the same author; and much may be learnt from Haden's lectures, which were reported in the Building News.—C. E. Clayton.

[6480.]—**Light and Air.**—The windows having enjoyed an uninterrupted access of light for over twenty years give their owner a perfect right. The owner of the other property mentioned can build so as to interfere with the view, but not the access of light. The distance between the new and old buildings must naturally have something to do with the light. The question of for what purpose the premises are used makes a difference in the assessing of compensation. Should "Perplexed" wish for further information, I shall be pleased to furnish it if he will call or write to—W. J. N. T., 35, Great James-street, W.C.

LEGAL INTELLIGENCE.

Liability of Payment for Quantities. — Birdseye v. The Commissioners of the Dover Harbour Board.—At a sitting in Nisi Prius on the 13th inst., before Mr. Justice Manisty and a special jury, this action was heard. Mr. Murphy, Q.C., Mr. A. L. Smith, and Mr. R. Bray were counsel for the plaintiff; Mr. M'Intyre, Q.C, and Mr. Finlay appeared for the defendants. It was an action brought by a quantity surveyor against the defendants to recover the sum of £76 5s. for fees. The plaintiff relied on an employment by the defendants' architect and on a custom in the building trade that when a builder or contractor did work, the architect had a right to call in the assistance of a quantity surveyor, to be paid by his employer. The defendants denied any contract and employment, denied the custom, and said it did not apply to this case. It appeared that in April, 1878, a Mr. Adcock had agreed to take certain land of the defendants at Granville-gardens, Dover, and to build there certain waiting-rooms, refreshment-rooms, and baths. He was to lay out the residue in gardens and pleasure-grounds. By June, it became necessary, as the buildings and gardens were nearly completed, that they should be measured up and the amount ascertained. Thereupon the plaintiff was employed and rendered the services sued for in the present action. Mr. Adcock was to be paid for any expenditure he was put to beyond £350 by the Board; and the large sum of £4,150 was alleged to have become due to him. The greater part whs paid off, but there remained a balance of £1,005, and this was reduced by a compromise made with Mr. Adcock by Mr. Finnis, a member of the Board, to £700 on November 4, 1878. Mr. Adcock stated he was induced to accept the lower sum on the condition of the Board's paying the professional charge—*i.e*, the solicitor, the architect, and the surveyor. The plaintiff sent in his account to the Board on January 13, 1879, but Mr. Stilwell, the solicitor and registrar, replied the next day that the Board knew nothing about it, and had never authorised the employment of the plaintiff. The following day the plaintiff again wrote:—"Mr. Adcock informed me the Board had agreed to pay my account direct, or I should not have sent it to you." The matter thus slumbered till October, when Mr. Adcock wrote to the chairman, "May I ask you to pay Mr. Birdseye's account, as it was agreed by Mr. Finnis with me when the compromise was effected that the Board should pay the surveyor?" To this Mr. Stilwell answered, "The Board know nothing about it, and the plaintiff was so informed as far back as January of this year (1879)." Nearly a year elapsed before the plaintiff issued his writ after this. For the plaintiff, several architects and surveyors were called, who spoke to the custom of the building trade, that in any large matter, say, over £2,000, the architect was entitled to call in a quantity surveyor, to be paid by the employer. For the defendants there were called Mr. Stilwell, Mr. Finnis, Mr. Humphreys, Mr. Pearce, and Mr. Court, members of the Harbour Board, who were present at the meeting of February 5, 1878, when Mr. Williams, one of the plaintiff's witnesses, was there. The plaintiff's name was not mentioned as a man to be employed. Mr. Finnis said he had told Mr. Adcock the Board would pay the architect, but he did not see why the architect should not pay his own surveyor. He was only advising Mr. Adcock to accept the compromise of the £700; he had always denied that he promised to pay the plaintiff. His Lordship, in summing up, said the evidence of a direct contract to employ the plaintiff was not so satisfactory as, perhaps, the jury might desire. But the great question was, whether they thought the custom set up had been proved—viz., whether in a work of this magnitude the architect or contractor had a right to call in to his assistance a quantity surveyor, whose services the employers were to pay for. Mr. Adcock appeared to fill the double part here of contractor and tenant under the defendant board, and that, perhaps, accounted for the plaintiff being left out in the cold when payment was made. And the second question would be, had Mr. Adcock accepted the £700 on the assurance that he would not have to pay the surveyor, but that the Board would do so. The jury promptly returned a verdict for the plaintiff for the amount claimed. Mr. M'Intyre asked for a stay of execution in order to move the Court. He and his learned junior both entertained a strong opinion that custom did not arise in this case, and that the contract alleged had not been proved. His Lordship: You may entertain a strong opinion, but you see this man has done the work, and he ought to be paid. I will not assist the defendants in any way. The learned Judge then, on the application of counsel, certified for a special jury.

STATUES, MEMORIALS, &c.

Frant.—A brass lectern has just been placed in Frant Church, Sussex, in remembrance of the late Viscount Stratford de Redcliffe, who spent the latter years of his long and eventful life at Frant Court, in that parish. The lectern is from a design by Mr. J. O. Scott, and has been beautifully executed by Messrs. T. Potter and Sons, of 44, South-Molton-street, and 298, Oxford-street, W. It consists of a massive brass eagle on pillar-ornamented with twelve cairngorms and bloodstones. The church of Frant has just been restored under the direction of Mr. J. O. Scott.

CHIPS.

Steady progress is being made with the erection of the new Eddystone Lighthouse, which now consists of 53 courses of granite masonry, rising 76ft. above high-water mark. From the commencement of the work in July, 1878, 1,400 hours have been worked on the rock, equivalent to 155⅓ days of nine hours each, and 1,800 stones, weighing in all about 4,100 tons, have been landed and set. Only 36 courses remain to be built, and it is hoped that the new light will be exhibited in March, 1882. Colza oil will be the illuminating agent, and, in addition to the light, a two-ton bell will be fixed on the rock, for use in foggy weather.

Mr. T. S. Stokes was last week appointed engineer to the waterworks department of the Improvement Commissioners for Wellington, Salop.

A carpenter named Tincombe, of Croydon, on Tuesday week had a dispute in a publichouse with a fellow-workman, George Robson, and struck him on the forehead with his umbrella, causing a puncture through the skull 2in. deep. Robson is not expected to recover. Both men are in the employ of Mr. W. J. Hobbs, builder, of Morland-road, Addiscombe.

A stained-glass memorial window was uncovered in St. John's Church, North Woolwich, on Easter Sunday. It is by Messrs. Gibbs and Howard, and represents two acts of mercy—clothing the naked and visiting the sick.

Mr. James Winter, stonemason and builder, of Hastings, died last week, aged nearly 80. He was formerly a clerk of works, and acted in that capacity during the building of Queen's Hotel, Hastings.

New Board-schools in Berwick-street, Soho, and Cator-street, Peckham, were opened on Monday evening. The former accommodates 1,000 children in three departments, and has cost, exclusive of site, £12,986; the latter seats 1,142 children, and cost, site included, £17,841 18s. 6d.

The annual report of the Baptist Union of Great Britain and Ireland, presented on Monday, states that during 1880 37 new chapels have been built at a cost of £39,800, and 24 new schools at a cost of over £6,000, whilst 86 chapels have been enlarged and improved at a cost of £24,500. 24,000 additional chapel-sittings have been provided by these means.

New Board-schools for 500 children, and residence for master and assistant master, are about to be be built at Preston-next-Faversham, from the plans of Mr. Benjamin Adkins, architect, of Faversham.

The Swansea newspapers of last week contained obituary notices of the late Mr. Thomas Rees, builder, of that town. He was a self-made man, and for 2½ years has been an active member of the town council, occupying the position of vice-chairman of the works committee. For many years he had acted as corresponding secretary of the Manchester Unity of Oddfellows. He was but 45 years of age at the time of death, which occurred unexpectedly. The funeral was attended by the town council, the borough police, the representatives of the Oddfellows and other benefit societies, and his workmen.

In our issue of April 15th, we give particulars of an eagle lectern placed in Skipton Church, and stated it was made by "Potts," of London. The makers' name should have been given as Messrs. T. Potter and Sons, of 44, South Molton-street, W.

The foundation-stone of a new Bible Christian Chapel was laid at Grampound, on Monday week. The chapel will be built of local killas with granite dressings, will seat 130, and will cost £350. Mr. Pendler, of Pentewan, is the architect, and Messrs. Treganno and Bennett are the builders.

Our Office Table.

A new lighthouse, the highest in France, has been erected at Planier, near Marseilles. Its height is about 67 metres (223ft.). It is 4 metres above that of Cordouan, and 10 metres above that of Dunkerque. The range of its light will be about 17 miles (or 31,500 m.). The last stone was placed in December. The base of the lighthouse is 18m. in diameter (60ft.); it is fixed in the limestone at 2m. depth, and rises 4·50m. above the water; on the sea side it is protected by a breakwater. The wall of the lighthouse diminishes in thickness from 2·40m. to 1·30m. The lantern will be a large chamber 4·30m. high. The light is to be electric, and to suffer eclipses.

Our notice of the Industrial section of the Richmond Exhibition last week was necessarily brief, and we omitted to mention a series of architectural and engineering drawings by F. J. Bancroft, South Kensington student, a junior, working under Mr. Berry Clarke, the highway surveyor to the Islington Vestry. They consist of the following:—Road and sewer construction, railway bridge over roadway, timber roof-trusses and church-gates and railings, as well as a good collection of timbers used in building construction, all catalogued with their botanical names, weights per cubic foot, &c.

The total number of structures erected in New York during 1880 was two thousand two hundred and fifty-two, the largest number in any year since 1871. A noticeable feature is the rapidity with which the fashion of apartment-houses has spread within a decade. The first building of this class in New York was erected in 1869. Similar ones had been constructed and found popular in Boston several years before; but the idea did not quickly gain favour in New York, and in five years after the first experiment, only a single house of the same kind was undertaken. In 1875 a change took place, and more than a hundred were built, with about as many more in 1876, 1877, and 1878. In 1879 two hundred and fifty-three were erected, and last year the number was five hundred and sixteen, making a total of twelve hundred and fifty-two such establishments now existing in a city which seven years ago possessed but two. This year there is reason to suppose that the number will be even greater, and the boarding-houses for which New York is renowned may yet be depopulated in favour of the home-life which French flats have brought within the reach of so many families for whom it would otherwise be unattainable.

The exhibition of ancient and modern furniture in the rooms of the Yorkshire Fine Art Society, at Leeds, has proved a success. The exhibition is now drawing to a close, this week being the last during which it will remain open to the public. This exhibition, however, is to be followed shortly by one of paintings by living artists, and from the promises already made, there would seem to be every prospect of an interesting and valuable display. The curator, Mr. James Dallas, has recently returned to Leeds from a tour of the studios in London, and many artists have promised him, or communicated in writing their intention, to exhibit pictures at the forthcoming exhibition. Amongst those who have so promised are Absolon, Aumonier, Guido Bach, Burgess, Calderon, Davis, G. A. Fitzgerald, J. E. Grace, E. A. Goodall, Grossmith, T. B. Hardy, Edwin Hayes, Herkomer, Jenkins, C. E. Johnson, G. G. Kilburne, Linton, Lucas, C. J. Lewis, P. R. Morris, J. S. Noble, Pettie, Pelham, Briton Riviere, Topham, Weeks, Walters, and Wynfield.

According to the *Daily News*, a project has been started for erecting an extensive building in Piccadilly, to be devoted to art-galleries, with the addition of a public hall, a restaurant, and shops. Arrangements have, we learn, already been made under which the annual summer exhibition of the Institute of Painters in Water-colours will be held in these galleries. The removal of the Institute to its new abode is to be accompanied by an important change in its rules—the privilege of exhibiting being thenceforth thrown open to all painters in water-colours. There will, however, be a process of selection, on the principle of the Royal Academy. Similar arrangements are in contemplation for

an exhibition of oil-paintings in the winter in the same galleries.

On Friday last a series of drawing-room lectures, given under the auspices of the National Health Society, was commenced at the residence of Mr. C. Matthews, Hertford-street, Mayfair. The lectures will be on every Friday until the 27th prox., the lecturers including Dr. Robert Farquharson, M.P., Mr. C. N. Cresswell, Dr. Henry Power, Dr. Siemens, and Mr. Ernest Hart, the subjects being "Health in Public Schools," "Sanitary Relations of Local Government," "Care and Education of the Eye," "Stoves and Grates," and "Recent Progress in Health Knowledge." The lecturer on Friday was Professor Fleming Jenkin, F.R.S., whose subject was "Sanitary House Inspection," and in opening his discourse the lecturer dwelt upon the necessity of the householders knowing the sanitary condition in regard to water supply and the exclusion of sewer-gas from the houses in which they dwelt. He described the grievous consequences which might occur through defective fittings, these consequences being attacks of typhoid fever, the ill-trapping of a drain or bad plumber's work causing fatal ventilation of sewers into sleeping-rooms. He illustrated by drawings and by a model the means taken to "seal" the sewer gases; but at the same time he pointed out the ease with which these contrivances got out of order; hence, he urged, the necessity of householders making themselves acquainted with the condition of their dwellings or intended dwellings, and he commended the means of late offered to the public of obtaining the information necessary to guard them against dwelling in a house under insanitary conditions.

On Saturday the experimental works in connection with the proposed Channel Tunnel were inspected by Sir Edward Watkin, and between 20 and 30 other gentlemen. The geological formation of the strata through which the headway is being drilled continues, and it appears likely to continue, to be composed of the grey chalk, a geological composition which is peculiarly favourable to the operations from the remarkable resemblance between the geological strata on either side of the Channel even to the minute particulars. It seems more than probable that the formation is continuous throughout the bed of the Channel. The circular heading starting from Abbot's Cliff is 90ft. below the level of the South-Eastern line, and 30 yards in the cliff, measuring from the down-rail. The drilling is advanced by means of one of Colonel Beaumont's compressed-air engines, at the average rate of about a quarter of an inch per minute, the disc to which the cutters are attached revolving twice in that time, and the entire length of the heading is now rather more than 300 yards. The *débris* is removed from the heading on a tramway in trolleys drawn by ponies of a Welsh breed. Another shaft now being sunk, and already in an advanced stage, is on the west side of Shakepeare's Cliff, and as soon as the required depth is reached the drill machine will be removed here, so as to enable the miners to meet the present heading. This, it is calculated, will greatly assist the progress of the work, as any water that may thus percolate through the chalk will run towards the shaft. The gradient is one in eight, and the ventilation of the heading is effected by means of the exhausted air from the engines.

At a meeting of the Royal Scottish Society of Arts, on Monday, Mr. Edward Sang read the first of a series of papers on surveying instruments, in which he strongly condemned the use by civil engineers and surveyors of the common tripod for the support of their surveying instruments. The tripod was, he said, constructively unscientific and insufficient for that purpose, and it was not creditable to civil engineers and surveyors that it should continue to be used by them after Robinson's stand had been made on scientific principles, and seeing that photographers never used for supporting their cameras any stands but such as were made on those principles.

It is said that some opposition is contemplated to Mr. Gladstone's proposal of a public monument in Westminster Abbey to Lord Beaconsfield. It is strongly urged that, in view of the monument raised to Lord Palmerston, followed by the present proposal, the country would drift into a systematic raising of public memorials to every deceased Prime Minister, good, bad, and indifferent. There are many who hold in respect both the late and the present Premier, but we trust there are some also who, remembering how Westminster Abbey is at present encumbered, cannot view without apprehension the prospect of further additions.

About sixty members of the St. Paul's Ecclesiological Society dined together on Tuesday evening, at the Guildhall Tavern, under the presidency of the Rev. Canon Gregory. The toasts drunk were—"Church and Queen," "The Dean and Chapter of St. Paul's" (which was received with great enthusiasm), "The St. Paul's Ecclesiological Society," "Architects and Ecclesiologists," "The President, Vice-Presidents, and Council of the Society," and "The Chairman." The last toast elicited unbounded applause, the rev. chairman having given cordial support to this society from its commencement.

It may not be generally known that earthenware or terra-cotta pots have been used in several modern buildings in London. Among vaults and roofs so constructed, mentioned in the last number of the "Architectural Dictionary," are, the dome of the rotunda, Bank of England, by Sir J. Soane, R.A.; work at Buckingham Palace, by J. Nash; at the National Gallery, by W. Wilkins, R.A; and the vault of the room added in 1839, by C. R. Cockerell, to the University Library at Cambridge. Arching by common flower-pots is not uncommon; it was used at the first baths and washhouses in Lambeth, but the girders from which the arches sprung, being of timber, rotted, and the construction failed. It is said that champagne bottles will often withstand a pressure of 40 atmospheres and upwards, or 600lb. on the square inch. The introduction of concrete has, in a great measure, superseded this very useful kind of covering, but for vaults and domes the hollow pot offers a light and highly fire-proof construction.

Messrs. Shuffrey and Co., 2, Broad-street-buildings, Liverpool-street, London, E.C., have brought out a book of wall-papers, containing specimens of actual patterns kept in stock. Many of these papers are artistically designed, and are printed in pleasing shades of chocolate, greens, and buffs. Some of the papers of the first and darker shades are intended for dadoes, the coloured surface being relieved by a conventionalised patterns of foliage. A great recommendation of the designs is their freedom from tawdry meaningless ornament, which generally destroy all pictures and works of art placed against them. Messrs. Shuffrey appear to have met a want in producing inexpensive wall-papers of good design suitable for houses of the middle-classes, and the prices they quote are sufficiently low to enable a tenant to paper his room throughout with patterns that will form a quiet background, and be free from artistic objections. The "Daisy" pattern, in red, blue, and green, is pleasingly arranged, well covering the ground with leaves and flowers, and the price is 3s. per piece. We may also note the patterns "Ox-Eye," "Indian" (No. 6), the "Cone," "Honeysuckle" (No. 17), "Diaper" "Moresque" (No. 18), as suitable for rooms of ordinary houses. The remarks of Mr. G. Sherrin, prefixed to the specimens, will be found suggestive, if not always judicious. The author says: "A pleasing way of treating the side of a room is to paper with these (dado papers, Nos. 1, 2, and 3 in the book) to a height of about three-fourths that of the room, finishing with a picture rail rebated, as shown on sketch, to receive brass picture hooks, and covering the space above with an embossed enrichment or a lighter paper. By this treatment pictures have the advantage of a dark rich background, and an effect of air and space is obtained by the lighter decoration above." The table to calculate the number of pieces of paper for any room is useful. Messrs. Shuffrey propose to publish also examples of stoves, tiles, enrichments, and finger-plates in another section.

The new school of art was opened in Manchester on Wednesday by the Earl of Derby. The building has been erected at a cost of £25,000, of which £7,000 remains unpaid, and Lord Derby promised to do his part in wiping off this debt if the people of the city would do theirs. In the evening Lord Derby delivered an address in which he dwelt on the development of art in this country during the last half-century, and the beneficial influence it had in counteracting the gradual disappearance of the beauties of nature in our country, and our tendency towards excessive industrialism.

Messrs. John Broadwood and Sons, of Great Pulteney-street, have had on view lately a pianoforte of a highly decorative and artistic character. The principal feature of this work of art is that the case is decorated in gesso, a style of ornamentation which has recently been revived by Miss Kate Faulkner, who has designed and executed the work. The case is of oak, the gesso ornamentation being raised in relief, gilded and painted. Inside the case is enriched with crimson, and the workmanship throughout is of the highest class. Few objects of furniture better admit of high art decoration than the grand pianoforte; its large flat surfaces and the sides of the instrument are capable of being treated in a style worthy of the highest art, in which symbolic subjects and colour of the richest kinds may find a fitting place. Messrs. Broadwood and Sons have lately done much to show how high decorative art can be applied to the pianoforte.

A course of six practical lectures, specially addressed to working plumbers, and illustrated by examples, diagrams, and working models and demonstrations on "The Science and Art of Sanitary Plumbing," will be given at the request of the National Health Society, by Mr. S. Stevens Hellyer, author of "The Plumber and Sanitary Houses," at the rooms of the Society of Arts, John-street, Adelphi, on May 17th; June 1st, 14th, and 28th; July 12th and 28th. To commence each evening at 7.30. That some further good may result to the plumbers attending them, the National Health Society will award prize medals to the plumbers who shall pass certain examinations in the art and science of plumbing. Further particulars of this will be given before the lectures are concluded. After the close of this course of lectures examinations will be held of a practical nature, including working tests. Two large silver medals, several smaller silver and bronze medals will be awarded by the National Health Society for superior merit; and certificates of proficiency will be awarded to all working plumbers who show their competency.

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CHIPS.

In our issue of the 15th of this month we noticed the design of Mr. Pritchett, architect, of Darlington, for the new Congregational schools now in course of erection at Sunderland, one leading feature of which was the adoption of a series of revolving shutters for the purpose of dividing classrooms. These revolving divisions, we should have remarked, are being supplied from the Ure Mills, Ulverston (Mr. John Stones, manufacturer).

At a meeting held at Liverpool on Saturday it was decided to build fifteen new churches in the city and suburbs, and to raise for this purpose a fund of £100,000.

A group of buildings, including a women's club and café, and crèche, with shops facing the street, are about to be erected in Heathcote-street, Nottingham. Mr. R. C. Sutton, of that town, is the architect.

A company has just been formed at Teignmouth for the formation of public baths. Mr. Rowton, of that town, has prepared the plans, and the cost of the buildings is estimated at £1,500.

A new altar and altar-rail have been placed in Roxwell parish-church, near Chelmsford. The work was carried out under the direction of Mr. E. C. Lee, of Great James-street, Bedford-row, by Mr. Hammond, of Romford.

A reredos of marble and glass mosaic has just been placed in All Saints' Church, Eastbourne. A dados of rouge royale marble, 4ft. in height, is placed against the east wall, and, above this, in an arcade, figures of eight of the Apostles, while in the centre, above the Communion-table, is a glass mosaic, representing the Lord's Supper. The whole is the work of Messrs. Basle and Co., of Newman-street, Oxford-street, W.

At a special meeting of the Rhyl town commissioners, held on the 13th inst., a report was received, stating that Mr. Joseph Williams, whose tender, the lowest, had been accepted for the restoration of the town hall, had declined to carry out the contract, as he found the cost would be £139 7s. 6d. more than his estimate. It appeared that this was the second time tenders had been invited, and the lowest withdrawn after acceptance, and the commissioners divided on the question whether they should take the next lowest tender or re-advertise. The latter course was, by a large majority of votes, adopted.

The Ystradyfodwg and Llantrissant joint burial board have adopted plans and designs by Mr. W. H. Jenkins, of Pontypridd, for the laying out and erection of buildings, including chapel, lodge, and gates, at their new cemetery at Rhondda, Porth.

The foundation-stone of new Roman Catholic schools was laid at Hertford, on Thursday in last week, by Mrs. O'Ratigan, of Bengeo, wife of the present architect of the building, which was designed by Mr. W. K. Broder, of London, who was recently killed by an accident on the Metropolitan Railway. Mr. Norris, of Hertford, is the builder.

It is expected that the Academy dinner to-morrow will be rather duller than usual. Mr. Gladstone is expected to make a speech on art, and at the same time to say something, on neutral ground, about the rival whose utterances at these annual feasts were among his best.

Memorial stones of new schools in connection with Albert-place United Methodist Free Church were laid at Bolton on Saturday. The buildings include an assembly-room, 62ft. by 36ft.; six classrooms, and an infants' room, 22ft. by 16ft. At the same time the chapel is to be lengthened by 25ft., and a new gallery erected in it. The alterations and new buildings will cost £2,400, and are being carried out by Mr. Joseph Robertshaw, from the plans of Messrs. Maxwell, Tuke, and Hurst, of Southport and Bury.

A new chapel and schoolroom, with a block of five houses adjoining, are about to be erected at Hebden-bridge, near Huddersfield, from the plans of Mr. T. W. Helliwell, of Brighouse and Westminster.

The foundation of a new Roman Catholic church at Great Warley, near Brentwood, was laid on Wednesday week by Cardinal Manning. The site is opposite the barracks, and the church, which is dedicated to St. Patrick and All Saints, consists of nave 42ft. by 20ft. 3in.; chancel 18ft. by 20ft., and tribune, or transept, 15ft. 6in. by 20ft. 5in. The style is Early English. Mr. F. W. Tasker, of John-street, Bedford-row, W.C., is the architect, and the contract for the present section of the work has been taken at £2,500 by Messrs. Lathey Brothers, of Battersea.

At a meeting of parochial delegates held at Kirkwall on Tuesday week, plans by Mr. T. S. Pearce, architect, were finally approved for the proposed combination poor-house for Orkney.

A stained-glass window has been erected in St. Edward's parish-church, Romford, as a memorial to Midshipman A. T. Luard, R.N., who was killed by a fall from the rigging. The subject is St. Peter walking on the waves. Mr. T. Bell, of Great Russell-street, W.C., executed the work.

The commissioners of Canvey Island, on the Essex bank of the Thames, have instructed Messrs. R. B. Grantham and Son, civil engineers, to survey the river walls, and report as to the works necessary to render them secure.

The restoration of the Wesleyan chapel at Frock, Cornwall, has been completed and taken possession of again by the trustees of Truro, from the designs of Mr. Silvanus Trevail, architect, of Truro. Messrs. R. Julian and Sons, of Truro, were the contractors.

A new college for ladies is in course of erection at Shipton-under-Wychwood, Oxon. Mr. Alfred Groves, of Milton-under-Wychwood, is the contractor.

The new member of the French Academy elected in the place of the late M. Mariette, the Egyptologist, is Dr. Julius Oppert, the distinguished writer on Assyrian archæology. He was born in Hamburg in 1825, but the professoriat in Germany being closed to him owing to his being of the Jewish religion, he migrated to France and became a naturalised Frenchman. In that country he held a chair of Sanscrit and afterwards that of Assyriology, and gained the Imperial prize of 20,000 francs "for the work on discovery most calculated to serve and honour the country" by his investigations on Babylon (the site and extent of which he precisely determined) in Assyrian chronology, and in the decipherment and interpretation of the cuneiform records. On these subjects Dr. Oppert has published a large number of works and essays.

A memorial to the late Canon Meade has just been completed in the chancel of Castle Carey Church. It has taken the form of an inscribed brass on the wall, the laying of the altar space with Minton's tiles, and the raising of the altar upon a Belgian marble step. Messrs. Francis and Son were the builders.

NOTICE TO ARCHITECTS.

The Opening Meeting of the GENERAL CONFERENCE of Architects of the United Kingdom will be held at the Rooms of the Royal Institute of British Architects on FRIDAY, the 6th May, at 8 p.m.

The INSTITUTE DINNER will take place on SATURDAY, 7th May, at the Freemasons' Tavern, at 7.30 p.m precisely. Members and others desirous of obtaining Tickets for the Dinner are requested to apply AT ONCE to the undersigned.

J. MACVICAR ANDERSON, Hon. Sec.
WILLIAM H. WHITE, Secretary.
Royal Institute of British Architects, 9, Conduit-street, Hanover-square, London, W.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Royal Institution. Annual meeting. 2 p.m.
Society of Engineers. "Floating Docks—Depositing and Double Power." By J. Standfield. 7.30 p.m.
Society of Arts. "The Art of Lace-Making." No. III. By Alan S. Cole. 8 p.m.
Institution of Surveyors. "Land Law Reform." By G. M. Freeman. 8 p.m.

TUESDAY.—Institution of Civil Engineers. Discussion on "The Relative Value of Upland and Tidal Waters in Producing Scour." 8 p.m.

WEDNESDAY.—British Archæological Association. Annual General Meeting. 4 30 p.m.
Society of Arts. "Buying and Selling: its Nature and its Tools." By Professor Bonamy Price, M.A. 8 p.m.

THURSDAY.—Civil and Mechanical Engineers' Society. Annual Meeting.

FRIDAY.—General Conference of Architects. Opening meeting. Reception, 8 p.m.; President's address, 8.30 p.m.
Royal Institution. "Land Systems of England and of Ireland." By Hon. Geo Brodrick. 9 p.m.

SATURDAY.—General Conference of Architects. Reading of papers on "Quantities." 11 a.m.
Institute Dinner at Freemason's Tavern. 7 for 7.30 p.m.

Lamplough's Pyretic Saline is refreshing, most agreeable, and the preventive of FEVERS, BILIOUSNESS, SMALL POX, SKIN DISEASES, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill. *Use no substitute* —[ADVT.]

Holloway's Pills and Ointment.—The poorer inhabitants of large cities will find these remedies to be their best friend when any pestilence rages, or when from unknown causes eruptions, boils, abscesses, or ulcerations betoken the presence of taints or impurities within the system, and call for instant and effective curative medicines.

Trade News.

WAGES MOVEMENTS.

ASHTON.—The house-painters of Ashton-under-Lyne struck work for an increase of wages on Monday.

Doulting Freestone and Ham Hill Stone of best quality. Prices, delivered at any part of the United Kingdom, given on application to
CHARLES TRASK,
Norton-sub-Hamdon, Ilminster, Somerset.
—[ADVT.]

McLACHLAN & SONS, 35, St. James's street, S.W. Builders, Decorators, and House Painters. Designs and Estimates.
General Repairs and Alterations Executed. Experienced Workmen always in readiness, and sent to any part of the country.—[ADVT.]

BATH STONE.
BOX GROUND,
THE BEST FOR ALL EXTERNAL USE.
CORSHAM DOWN
CANNOT BE SURPASSED IN BEAUTY OF APPEARANCE FOR INTERIOR WORK.
PICTOR & SONS, BOX, WILTS.
(See trade advt. on p. XXV.) [ADVT.]

TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender—it adds to the value of the information.

BILLINGHAY.—For police-station. Plans and quantities by Mr. Charles Kirk, county surveyor for the parts of Kesteven, Lincolnshire:—

Spink and Copeland, Heckington	£1,570 0 0
Featherstone & Perkins, do. ...	1,494 16 0
Wartnaby, R., Sleaford	1,299 0 0
Alister, S., Wisbeach	1,275 10 0
Clark, H., Boston	1,244 11 0
Ingall and Wilson, Billinghay ...	1,227 5 3
Raunds, H. and Son, Wisbeach ...	1,220 0 0
Sherwin, S., Boston...	1,195 0 0
Knight and Maxey, Martin and Sleaford	1,120 0 0
Jordan, W., Billinghay (accepted)	1,100 0 0

BOURNEMOUTH.—For the erection of an establishment for the reception of invalids, visitors, and residents, being the Mont Dore, of Bournemouth, to be erected on the site of the Glen at Bournemouth, Hampshire, including the baths establishment in connection therewith. Mr. A. Bedborough, architect. Quantities supplied by Messrs. R. L. Curtis and Son:—

	Contract.	Extra for Penmon stone.	Old Material
Colls...	£41,900	£3,867	£250
Rouse	39,100	1,650	400
Perry and Co. ...	38,000	..	110
Jenkins and Son ...	37,850	2,200	500
Jones and Co. ...	37,450	2,300	250
Kirk and Randall .	36,479	2,171	100
Foley	36,449	1,429	250
Hoare, Bros. & Co.	33,999	1,497	500
Blatchford... ...	33,700	500	255
Howell and Son ...	33,400	1,260	150
Stroud	32,500	1,500	250
Clarke	30,998	1,159	400

BRIGHTON.—For the erection of a house, Third Avenue, West Brighton, for Mr. G. H. Hammond. Mr. Woodman, Brighton, architect:—

Field, W. A. and B...	£4,740 0 0
Parsons and Sons	4,350 0 0
Lockyer, G. R.	4,220 0 0
Ockenden, E. J.	4,100 0 0
Bruton, J.	3,975 0 0
Barnes, J.	3,960 0 0
Chappell, J. T., (accepted) ...	3,826 0 0

BRIGHTON. — For erecting and completing a steam laundry, for the governors of the Sussex County Hospital. Messrs. Scott and Hyde, architects. Quantities by Mr. F. W. Hyde:—

Wright, Brighton	£2,570 0 0
Patching and Son, Brighton ...	2,540 0 0
Webber and Son, Brighton ...	2,472 0 0
Cheeseman and Co., Brighton ...	2,450 0 0
Newnham, Brighton	2,435 0 0
Coleman, Brighton	2,395 0 0
Marshall, Brighton	2,350 0 0
Steyning, Brighton	2,350 0 0
Griffiths, Brighton	2,290 0 0
Lockyer, Brighton	2,270 0 0
Longley, Worth (accepted) ...	2,047 0 0

BRISTOL.—For new premises, 34, Temple-street, for Mr. Darling. Mr. W. Cloutman, surveyor. Quantities by the surveyor:—

Weeks, F. and J.	£399 0 0
Pitt, B.	350 0 0
Walters, E.	320 0 0
Weaver and Mizen	316 0 0
Dubin, W.	314 9 0
Belmont and Quin	310 0 0
Banner and Co.	305 0 0
Bastow, J.	305 0 0
Bevan, H.	305 0 0
Cowlin, S.	297 0 0
Eastabrook and Sons	285 0 0
Forse and Ashley	285 0 0
Tucker, T.	281 0 0
Roberts, G. and W.	280 0 0
Sharp and Graham	273 0 0
Lovell and Sons	269 0 0
Hayes, C. A.	263 0 0
Perrott, J.	259 10 0
Hayes, J. and W.	254 0 0
Hodges, E. M.	245 0 0
James, J. (accepted)	235 0 0

CHIPPING NORTON.—For chapel and lodge, Chipping Norton Cemetery. Messrs. Kemp, Walsh and Pinder, Bournemouth, architects:—

Burden, Chipping Norton	£590 0 0
Lewis, Chipping Norton	545 0 0
Hobbs, Chipping Norton (accepted)	510 10 0

COLCHESTER. — For the erection of a dwelling and carriage-house, for Mr. J. G. Goby, in Bath-road. Mr. Horace Darken, Colchester, architect:—

Dobson, G.	£795 0 0
Farran, G.	770 0 0
Lee, G.	765 0 0
Oldridge, F. H.	756 10 0
Dupont, F.	733 0 0

COVENTRY.—For the erection of range of stabling and walling thereto, &c., to Eaton House, for Mr. T. R. Russell. Mr. W. Tomlinson, A.R.I.B.A., Coventry, architect:—

Price, H., Coventry (accepted).

Stabling.	Walling.	Kitchen Extension.
£436 0 0	£54 0 0	£165 15 0

DEPTFORD.—For constructing 765ft. run of 15in., and 1,100ft. run of 12in. pipe sewers in Edward-street West, Arklow-road, Galway-road, and Trim-street, Deptford, or the Greenwich district Board of Works:—

Jennings (accepted) £805 0 0

DULWICH. — For conservatory to Bosky Bank for Jas. Henderson, Esq. Mr. R. Peters, Wool Exchange, Coleman-street, E.C., architect:—

Watson and Dennett £150 0 0
Accepted.

Edgeworth.—For Children's Home (Lancashire branch), Edgeworth, near Bolton, governor's residence, offices, and stores, &c. Mr. T. Ormrod, Bolton, architect :—

Peacock, W.	£786 10 0
Martin, Bros. (accepted)	665 0 0

Concrete floors and iron joists (ground-floor), finished partly in cement —

Swarbrick, R. and Co....	£40 10 0
Holman and Rodgers (accepted) ...	38 14 6
Lowe, R. L.	38 5 0

Note.—The Committee provide stone flags, lime, and sand for masonry.

Forest Gate.—For two semi-detached villas at Forest Gate. Messrs. A. and C. Harston, architects. Quantities supplied :—

Crockett	£2,400 0 0
Harris and Wardrop	2,346 0 0
Kilby	2,322 0 0
Johnson	2,275 0 0
Hearle and Son	2,153 0 0
Nichols	2,100 0 0
Shurmur (accepted)...	2,070 0 0

Great Yarmouth. For houses and shop, St. George's-road, for Mr. F. Carpenter, allowing for old materials. Messrs. Bottle and Olley, Great Yarmouth, architects :—

Howes, E.	£1,680 0 0
Davey, R.	1,531 0 0
Salmon, G.	1,490 0 0
Howes, T.	1,467 0 0
Rouse and Beech	1,450 10 0
Harbert, J.	1,439 10 0
Springall, B.	1,411 0 0
Want, J. (accepted)...	1,335 0 0

Great Yarmouth.—For St. Mary's Catholic Elementary Schools, Great Yarmouth. Messrs. Bottle and Olley, 28, Regent-street, Great Yarmouth, architects :—

Excavator, bricklayer, plasterer, and mason—

	Gross Amount.	Deducted for Old Materials.	Net Amount.
Howes, T. ...	£1,369 0 0	226 0 0	1,143 0 0
Beech and Cork	1,325 0 0	190 0 0	1,135 0 0
Howes, E. ...	1,340 0 0	245 0 0	1,095 0 0
Leggett, J.* ...	1,385 0 0	305 0 0	1,080 0 0

*Accepted.

Slater :—

Dawber and Son (accepted) ...	£224 10 0 0

Carpenter, joiner, plumber, glazier, and painter—

Cooper, T.	£1,082 10 0
Kemp	1,047 0 0
Davey, R.	961 0 0
Salmon, G.	932 0 0
Springall, B.	906 10 0
Bray, J.	871 5 0
Want, J. H. (accepted)	827 0 0

Smith and ironfounder—

Barge and Freeman (accepted) ...	160 0 0

[Total (gross amount), £2,596 10s.; architect's estimate, £2,622.]

Herne Hill.—For building the Hamilton Arms, Herne Hill, S.E., for Mess s. Mann, Crossman and Paulin. Mr. Ernest Shum, 14, Great James-street, Bedford-row. London, architect. Quantities by Mr. J. G. Raynes:

Langmead and Way (accepted) ...	£1,190 0 0

Laygate.—For P. M. chapel and school, Laygate-lane :—

Francis Mackey, South Shields ...	£4,375 0 0
Gilfillan and Green, South Shields	4,356 6 2
Atkin, R. and Co., South Shields	4,173 0 0
Suddards, E., South Shields ...	4,170 12 5
Marshall, A. and P., S. Shields ...	4,137 0 0
Brown, W. F., Sunderland ...	4,104 0 0
Hall, A., South Shields	3,920 6 10
Nichol, J. C., South Shields ...	3,830 0 0
Atkinson, J., Gateshead	3,706 2 1
Murray and Adams, Jarrow ...	3,700 10 0
Akenhead and Knox, Consett ...	3,556 4 0
Knight, J., S. Shields (accepted) .	3,449 16 3
Lowest of separate tenders ...	3,416 0 0

Leigh, near Manchester.—For dwelling-house, for T. Danby, Esq. Mr. T. Ormrod, Bolton, architect :—

Wright, J.	£1,080 0 0
Norbury, T. (accepted)	1,000 0 0

London.—Four warehouses, Nos. 2, 3, 4, and 5, Bunhill-row, City, E.C., for Mr. W. Walker. Messrs. Davis and Emanuel, 2, Finsbury-circus, E.C., architects. Quantities by Mr. Frederick Downing, 7a, Whitehall-yard, S.W. :—

Higgs and Hill	£5,140 0 0
Williams, G. S. S. and Son ...	5,130 0 0
Pritchard, G. S.	4,989 0 0
Lawrance, E....	4,684 0 0
Boyce, T.	4,672 0 0
McLachlan, J. and Sons	4,671 0 0
Grover, J.	4,448 0 0
Brass, W.	4,393 0 0

Kilburn.—For the erection of a parsonage house in the Needs-road, Kilburn, Middlesex, for the Rev. Ralph Williams. Mr. A. Letts, architect. Quantities supplied by Messrs. R. L. Curtis and Son :—

	Main Contract.	Separate Estimate No. 1.	Separate Estimate No. 2.	Separate Estimate No. 3.	Total.
Reed...	£2,862 0 0	£67 10 0	£45 10 0	£24 0 0	£2,989 0 0
Patman & Fotheringham	2,483 0 0	43 0 0	47 0 0	25 0 0	2,598 0 0
Woodward... ...	2,459 0 0	48 0 0	47 0 0	22 0 0	2,576 0 0
Roberts	2,360 0 0	45 0 0	45 0 0	17 0 0	2,467 0 0
Yerbury	2,348 0 0	26 17 0	43 0 0	20 15 0	2,438 12 0
Boyce	2,298 0 0	46 0 0	40 0 0	20 0 0	2,398 0 0

Leyton.—For roads, sewers, and surface-water drains, for the British Land Co. (Limited), on their estate at Leyton station. Mr. Henry B. Michell, surveyor :—

Dunmore, Hornsey	£5,511 0 0
Crockett, St. Pancras	5,490 0 0
McKenzie and Co., City	5,270 0 0
Harris, Camberwell...	4,864 0 0
Thompson and Son, Battersea ...	4,850 0 0
Pizzey, Hornsey	4,579 0 0
Keeble, Regent's Park	4,567 0 0
Acock, City	4,358 0 0
Killingback, Camden Town ...	4,350 0 0
Bloomfield, Tottenham	4,099 0 0
Peill, Bromley	3,995 0 0
Jackson, Leyton	3,988 0 0
Wilson, Walthamstow (accepted)	3,900 0 0

London.—For painting, &c., at Nos. 19, 20, 21, and 22, Milton-street, City, for Messrs. Tubbs, Hiscock and Co. Mr. W. Smith, architect :—

Devonford and Laugham	£127 0 0
Harper	120 0 0
Shurmur...	102 10 0
Larke and Son	98 0 0
Steel Bros.	60 0 0
Johnson and Co.	39 9 0

Manor Park.—For roads and surface-water drains, for the British Land Co. (Limited), on their estate at Manor Park, Essex. Mr. Henry B. Michell, surveyor :—

Crockett, St. Pancras	£1,153 0 0
Dunmore, Hornsey...	1,043 0 0
Acock, City	1,027 0 0
McKenzie and Co., City	1,009 0 0
Killingback, Camden Town ...	964 0 0
Bloomfield, Tottenham	923 0 0
Keeble, Regents Park	765 0 0
Pizzey, Hornsey	735 0 0
Peill, Bromley	715 0 0
Thompson and Son, Battersea ...	710 0 0
Harris, Camberwell	700 0 0
Jackson, Leyton	688 0 0
Wilson, Walthamstow (accepted)	678 0 0

Marylebone.—For alterations and repairs at 6, Carburton-street, Portland-place, for Mrs. Williams. Mr. J. H. Martin, surveyor ;—

Butlin, J.	£425 0 0
Watson Bros.	394 10 0
Perkins, R.	379 0 0
White, R. (accepted)	315 0 0

Mayfair.—For additions and alterations to Curzon House, Mayfair. Mr. A. R. Pite, 44, Bloomsbury-square, W.C., architect. Quantities by Mr. Joseph Rookwood :—

Smith, J. and Sons (accepted) ...	£3,150 0 0

Notting Hill.—For alterations and additions to a warehouse and stables, for Metropolitan and Milk Supply Association (Limited). Mr. J. Randall Vining, architect :—

Higgs and Hill	£1,240 0 0
Potterton, T....	1,130 0 0
Marriage, W	1,050 0 0
Wood, J. and J. (too late) ...	1,047 0 0
Boyce, T.	879 0 0
Jordan, P. H. (accepted)	843 0 0

Portsmouth.—For villa residence, Bury-road, for J. D. Hill, Esq. (exclusive of painting, paperhanging, stoves, and chimneypieces). Mr. R. Peters, Wool Exchange, Coleman-street E.C., architect :—

Butt, J., Gosport (accepted) ...	£871 0 0

Shoreditch.—For workshops in Fournier-street, Shoreditch, for Mr. Keaves. Messrs. T. and W. Stone, architects :—

Thomason	£1,606 0 0
Beale	1,150 0 0
Forrest...	1,036 0 0
Shurmur	1,020 0 0
Crabb	985 0 0
Young	946 0 0
Steel	906 12 0

Southend-on-Sea.—For the repair of loading pier :—

Green and Burleigh (accepted) ...	£197 0 0

[A higher tender, that of Mr. Mason, £200, was withdrawn after acceptance.]

Sowerby Bridge.—For the repair of No. 1 gasometer, for the local board :—

Nicholson, J. and Son, Leeds (accepted).

St. Alban's.—For the erection of the new west front of St. Alban's Cathedral, for Sir Edmund D. Beckett, Bart, Q.C. :—

Longmire and Burge (accepted).

Stepney.—For reparation to four houses, St. Ann's and St. Dunstan's-roads. Mr. R. Peters, Wool Exchange, Coleman-street, E.C., architect :—

Parrish (accepted)	£70 0 0

Stratford.—For the repair of two houses, the Grove, Stratford, and converting same into shops. Mr. F. Le Rossignol, architect :—

Kingdom, J.	£1,083 16 0
Scott, S. J.	1,080 0 0
Harper, J.	1,063 0 0
Howard, C.	953 0 0
Arber, W.	939 0 0
Augood, J. (accepted)	905 0 0

Todmorden.—For 2,000 yards of 2ft. flagging for footpaths in Walsden and Eastwood, for the local board :—

Per lineal yard.

Butterworth and Brooks, Bacup* ...	£0 1 4

* Accepted.

[Lowest tender received].

Tottenham Court-road.—For alterations and repairs to Nos. 42 and 43, London-street. Mr. Walter Hall, 28, Southampton-buildings, Chancery-lane, surveyor :—

King	£406 0 0
Adams	352 0 0
Martin	320 0 0

Tunbridge Wells.—For warming and ventilating, by Messrs. J. Weeks and Co.'s new hydro-caloric apparatus, new wing of Bishops Down Grove Hydropathic establishment, Tunbridge Wells. Mr. B. Tabberer, architect :—

Weeks and Co., Chelsea	£400 0 0

Ware, Herts.—For alterations to the sewage tank, for the rural sanitary authority :—

Hitch, G. (accepted)	£68 10 0

[Lowest of two tenders received.]

BEST BATH STONE.

Westwood Ground, Box Ground, Combe Down, Corsham Down, and Farleigh Down.

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CORSHAM, WILTS.

Bath Stone.—Every description and the best quality supplied direct from his own Quarries by

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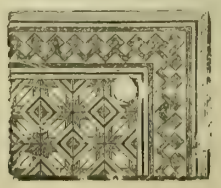

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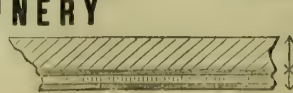

ORNAMENTAL PARQUET.
DEAL BACKING

THE BUILDING NEWS.

LONDON, FRIDAY, MAY 6, 1881.

THE PICTURES AT THE ROYAL ACADEMY.

THE first impression of the collection of paintings hanging on the walls at Burlington House this year is decidedly favourable. We have seldom seen better specimens of the work of some of the leading Academicians and Associates than what they exhibit this year.

It will, however, rather disappoint many admirers that some of the more popular artists have devoted most of their time to portraits. Mr. E. J. Poynter, for example, has only one subject-picture, and that of a single figure, No. 198, "Helen." He has chosen the moment when the end of the war, no new thing to her, was at hand. In the immediate prospect of the ruin that her beauty has caused, she stands "all passionless, with something of amaze," half-wondering that men should do such deeds for such as she. Behind her is the city in flames. Nothing can be better than the drapery of gold and red brocade and the jewellery; but the face is somewhat disappointing. The dazed blue eyes hardly suggest the Helen for whom two such nations fought so long and so bitterly. Among the veterans of the Royal Academy, T. Sidney Cooper shows a remarkable painting, "The Scape Goat" (No. 211), wandering in inaccessible mountains—not Eastern, however—but doubtless taken from our own Scotch Highlands. His others, four in number, are neither much better nor worse than what we have been used to of late years. The exhibition of Mr. Solomon Hart's single picture upon the line is a matter for regret. One of Mr. J. E. Millais's happiest pictures is No. 279. It is a portrait of a young girl in the character of Cinderella. Her surroundings are sombre and mean—a common smoke-stained stone kitchen, with a pair of bellows hanging over her head, a rough birchbroom at her side, logs of wood heaped up beside the smouldering fire. The neglected child sits solitary, but not without a certain braveness of endurance, well deserving the good offices of her fairy guardian. On a screen close by hangs the unfinished portrait by the same great artist, which will be regretfully gazed at by all sorts of people, of every shade of opinion. Her Majesty's command for its exhibition will be gratefully appreciated by all. It is in many ways a remarkable portrait of the great Earl who has just gone to his rest; differing in many ways from any other extant likeness, yet having a subtle truth of outline, such as probably no other living painter could have caught. One is struck particularly by the air of sadness which pervades the clever features. Unlike the portraits of Mr. Bright and Mr. Gladstone, this is taken from the side.

The President and council of the Royal Academy have made a valuable purchase of John Collier's "Last voyage of Henry Hudson," No. 260. It is a piteous tale, told with sad and earnest truthfulness. In the iceberg-crowded Arctic Sea the uncovered open boat is floating, which carries the great navigator and his little delicate son, with none but a few of the most sickly and infirm of the sailors as their companions, cast adrift by the crew who mutinied in the summer of 1611. They were never heard of more. Hudson sits at the bow of the boat, resigned to the horrible fate which he knows he cannot escape from, holding the hand of his poor, cold, starving boy. One helpless form, stretched on the bottom of the boat suggests the condition of the rest of the hapless crew. The same artist shows a good portrait of "Sir Joseph D. Hooker," No. 349, and a spirited and finely-coloured representation of "Mr. Booth as Richelieu," (No. 923), "The Curse of Rome." "A Frightful State of Things," No. 71, combines tragedy and comedy in ludicrous fashion. A poor little mite has been left by himself to finish his dinner from a dish on his lap, when the whole poultry-yard pays him a visit through the open door. The room is crowded with cocks, hens, turkeys, and chickens. You can hear the poor little mortal's shrieks of agony, as some geese with outstretched necks approach his plate. The picture is painted on a fine canvas, with little preparation, in a very dry medium, almost like tempera. The effect is good, except that there is an apparent flatness in the birds. The way in which the variegated sheen of the coloured plumage is got is very successful. The artist is Gaetano Chierici. Mr. Eyre Crowe has given in No. 66 a life-like description of one of the most stirring events of the war during the Indian Mutiny. The subject is the blowing up of the Cashmere Gate, at Delhi, Sept. 14, 1857. It was a desperate affair. After the powder-bags had been successfully placed at the foot of the gate, and Lieut. Salkeld and Sergeants Burgess and Carmichael had been killed in attempting to arrange the fuse, their place was taken by Sergeant Smith, who is represented on the old battered wooden bridge as lighting a lucifer to fire it, and has just time to leap down into the ditch, warned by the port-fire flashing in his face that the fuse was alight. The whole is solidly and well painted, without exaggeration or attempt at mere sensational effect. We see simply how, with various fortune, those brave men stood to their heroic work. Mr. G. H. Boughton has again chosen one of his favourite Puritan subjects, this time from the almost forgotten romance of "The Scarlet Letter." Hester Prynne, saved from the cruel death which might have been inflicted upon her by the heartless severity of the early Puritan settlers, gives her whole life for the good of all who needed help, regardless of the gibes which were too often thrown at her by the very people she assisted. Steadfast in her purpose of real goodness, the fair young woman is shown standing in the snow before a plague-stricken house, while a sour-looking neighbour drags away his little child from what he deems a double pollution. Yet she bears it all with patience, not altogether unhappy. There is plenty of fun and character about Federigo Andreotti's "During the Sermon" and "A Happy Father of Twins," Nos. 209, 210—the latter being two goodly flasks of generous wine, the idea of which rejoices the good father's heart. What but "Envy, Hatred, and Malice," could fill the hearts of that troupe of favourite dogs (No. 2) when they saw the self-conscious, black-nosed pug puppy apparently taking from them all their young mistress's love? Briton Riviere's knowledge of animal manners was never better shown. The great bloodhound on the left only presses his great head in remonstrance against her side. Not so the fox-terrier and collie, who show by their teeth that they would like, if they dared, to get at the little brute. The face of the girl is the least satisfactory part of the picture. No. 155 is in the artist's more serious manner "A Roman Holiday." The scene is in the arena of an amphitheatre. A Christian forced to fight with wild beasts for the amusement of the brutal populace, has killed one great tiger, and faint, perhaps dying, is tracing a cross in the sand with his reeking sword, the blood staining the outline as he forms it. Another huge monster, declining the combat, is walking away, glaring in hatred at the crowd of spectators. No. 402, "Let sleeping dogs lie"—any one who ventured to disturb either master or dog in this amusing picture would have himself to thank if evil came of it. It would be difficult to conceive a more disreputable pair than the dog and man here painted. The latter is excellent, a perfect representation of the lowest sort of rough—out of mischief because the plentiful draught indicated by the pewter-pot on the ground has for a time sent him off. The effect of Miss Clara Montalba's "St. Mark's, Venice,"—the piazza inundated—is magic. There is a flood of light reflected from the wet surface of the piazza. The colouring is gorgeous, the drawing perfect. Mr. Hubert Herkomer could not have chosen a better subject to display the points in which he excels than No. 373, "Missing," a scene at the Portsmouth dockyard gates, during that dreadful time of suspense when the ill-fated *Atalanta* was missing. All the emotions experienced by young and old at that unhappy time are represented in this fine picture. Old men and women scarcely able to bear up against the heartrending expectation of the loss of the young sons and grandsons who had been their chief support till now; young women despairingly anticipating the news of their lost brothers or lovers, all crowding together eager to hear the news they so much dreaded.

We have this year two highly-finished paintings by Mr. W. P. Frith. The more important is an exact representation of a wedding-party, "For Better for Worse," as it is called. The moment chosen is the departure of the bride and bridegroom, and the treatment is a realistic reproduction of what may be seen at any fashionable wedding. A handsome carriage and pair, with well-behaved and well-dressed servants, is drawn up at the door, and the young couple are getting into it. The normal policeman is there, to see that the vulgar do not approach too close. There are slippers in plenty, some already thrown, and, as usually happens, having missed the mark, some to be thrown when the carriage drives off, and some suspended in mid-air, in very comic fashion. The bridegroom is politely taking his cap off as he leaves. Father and mother are tearful, suggesting the exhilarating speeches that have enlivened the wedding breakfast. The company is behaving as wedding guests generally do on such an occasion. Some of the younger having evidently caught the fever, are preparing to follow the good example as speedily as possible. In contrast to all the wealth, comfort, and decorum of the scene, a villainous-looking red-haired mendicant, with his wife and ragged children, all for worse and no better, stand looking at the gay sight. The many admirers of Mr. Frith will no doubt crowd round this highly-finished though somewhat commonplace picture. Mr. Frith's other picture is of a higher aim (No. 182), "Swift and Vanessa"; the quarrel between poor Vanessa and Swift, upon her writing to Stella to try to find out what was the nature of her connection with Swift. The Dean is represented bursting with rage, simply flinging down her own letter to Stella, preparatory to his mounting his horse and leaving her to her wretchedness for ever. The painter has been, we think, more successful in realising the terror, unhappiness, and despair of the lady than the Dean's anger, which reminds one rather too much of the stage. All is neatly and carefully painted, with much attention to the details.

ARCHITECTURE AT THE ROYAL ACADEMY.—II.

IF the architectural drawings on the walls of Burlington House were at all representative of the state of architecture during

the past year, then it would have been admitted little progress has been made. In reality, however, no such test is afforded—a fact which the selection made by the hanging committee abundantly proves in the present exhibition. There are drawings as well as designs—the handiwork of men who can artistically express their own ideas, and others which represent merely the technical skill of the draughtsman. We have instances of bad design well drawn, and good design ill-drawn. It is easy to see that this contest of meritorious work with feats of draughtsmanship presents a difficulty to the Committee intrusted with the work of the year. The Academy, from the very nature of its constitution, has to promote, and as we think rightly, the pictorial part of the artist's work; at the same time, it is bound to give preference to those qualities which mark the distinction between the painter's and the designer's skill, and the value of the Academy to the architect will become less recognised as this point is lost sight of. A very large proportion of this year's work comprises designs *in esse* and *in posse*, drawings of domestic and ecclesiastical buildings of an unambitious kind, and in this notice we shall confine our remarks to a few of the representative contributions of these two classes, many of which have been illustrated in our pages. Timbered houses form the greater number of designs, and we take Messrs. Goddard and Paget's "Houses in course of Erection at Leicester," a large ink perspective, as merely showing the prevailing taste to make the gable and chimney the *raison d'être* of picturesque house building. Here the almost overpowering predominance of those features has been the aim. The Late Gothic timber treatment of Rowden Abbey, by Mr. John Douglas, already given in our pages, may be instanced as another clever drawing of a like kind, in which a chimney-shaft and a dormer gable have been combined in a way in which architects of late have been wont to indulge their fancy. The sketches of gable treatment by Messrs. Salomons and Wornum (1016) are also suggestive, and the "House near Battle" (1032) shows a bold timbered treatment with brick in Late Gothic, in which the architect, Mr. Oakley, has conspicuously displayed his chimneys. Mr. A. Waterhouse's "Clock Tower," proposed to be erected on the Liverpool pier-head (1010) is well proportioned: the square tower is gabled, surmounted by an octagon termination, and the design, intended to be in brick or terra-cotta, is sensibly indicative of its purpose, a merit of which many clock towers are strangely destitute. As a water-colour drawing it is one of the best of Mr. Waterhouse's contributions; with a true sense of colour the artist has been contented with a warm tone to express the material, and this subdued tinting is seen in the other drawings of Mr. Waterhouse to be noticed presently. We undertand the intention of erecting this tower has been abandoned. One of the best exteriors in this part of the room is by Messrs. C. E. Ware and Leonard Stokes, (No. 1019), "View of the Church of the Sacred Heart, Exeter." The drawing, which is boldly executed in ink, shows a well-proportioned west front, treated with considerable breadth, flanked by a fine tower crowned by a wooden lantern; the belfry lights are lofty, and the gable is pierced by three bold lancets under an inclosing arch. The vigorous drawing in black ink and the accentuated shadows are in contrast with other rather washy ink perspectives near. The large coloured perspective of the first premiated design for Pontefract Town-hall, Perkin and Bulmer, architects, is noticeable for its bold front and lofty open-belfried tower in the Renaissance style, handled with some freedom, and intended to be executed in stone. We might find fault with a littleness in some of the detail; the tower is not a square, to judge from the drawing, but decidedly oblong. These defects of detail are somewhat overweighted by the general outline and composition. Just above this design hangs a long elevation in brown ink, showing a symmetrical front with centre towers and an arcaded gallery in the wings. It is the Post and Telegraph Office, Madras. The style appears to be a kind of Saracenic, though handled with freedom, and the grouping of the centre part and the finish of the pyramidal roofs to the towers are a little curious. The treatment adopted, however, has the merit of lending itself to timber construction, and Mr. Chisholm's work is certainly well adapted for a tropical climate and the object of the building, considerations which should never be lost sight of. The large ink drawing of the "Lothians, Fitzjohn's Avenue, N.W.," by W. Wallace and Flockhart, deserves notice for the rather heavy Semi-Classic treatment. The wide windows in the upper story over the entrance destroy the scale of the building, which is otherwise quaint, and the cupola adds to the picturesqueness of the *ensemble*. A clever ink sketch for a small church to be erected in Sussex (1037) is contributed by Mr. W. H. Romaine Walker, the chief feature of which is the simple modest tower which rises from the crossing, and is crowned by a tile pyramidal roof after the true Sussex type. No. (1041), rather too high for inspection in a central position is Messrs. Pugin and Pugin's intended church and convent, Dumfries, shown by a well-finished water-colour perspective, about which little need be added than that it is in a good style and is well-grouped in the main. Mr. C. Bell's Over Darwen Town-hall design, (1st premiated) we have already illustrated; it is shown by a neat-coloured perspective in sepia. The broken-up gable, and the front frittered by breaks and Elizabethan detail, rather destroy the composition, which has much to commend it. Hung in a conspicuous centre place on the end wall is a charmingly-coloured water-colour interior of the library of Eaton Hall, by Mr. A. Waterhouse. As a drawing the work is almost perfect in its nice tone of colour, masterly handling, gradation of light and shadow and reflections; but as a design we certainly think it by no means a representative work of this master. The panelled ceiling looks heavy, and the beams and their ornamentation, and the shallow corbels under them, scarcely appear in keeping with other parts of this princely mansion. A similar want of proportion strikes us in the corbelling under the mantel of the chimneypiece, and especially in the coved cornice which, in the perspective, looks crushing to the detail below. Passing to the other and chief work of Mr. Waterhouse on the walls, No. 1084, the design for the Central Institution of the City and Guilds of London Institute, Exhibition-road, South Kensington, we may at once admit it to be an appropriate and dignified design, in which the architect has boldly availed himself of red brick and terra-cotta, and has also accepted the Semi-Classic style in the main features. The composition is broken by a centre gable flanked with turrets, and the wings are finished with massive projections; the apices of gables having pedimented panels modelled in terra-cotta with the coats of arms. The arched ends and the circular heads of the upper window range give a pleasing play to the lines; the roof is of red tiles, and Mr. Waterhouse has mainly relied for effect upon the broken lines of the gables and chimneys, and a well balanced façade to redeem the regular spacing of the windows in the main wings of his building. Professor G. E. Street, R.A, has four works. Of these, No. 1057, the first we come to, represents a view of the "English Church, Via del Babuino, Rome." Though the least interesting, from an artistic point of view, the building shows a skilful adaptation of style and materials, brick and coloured bands, to Italian requirements. The chief features are the apsidal end, a chancel aisle, and an octagon tower and spirelet, the axis of which is slightly twisted from that of the main axis of church, which gives it a rather false effect in the perspective. The two ink drawings, one of a monument to be erected in the south transept of York Minster to the late Dean (1093), and a companion one, "A View across the New Nave of Bristol Cathedral" (1109), are charmingly fresh and bright looking sketches. The monument is a canopied tomb, of the type of many of those in the 13th and 14th centuries, and the gabled ends are surmounted by sculptured figures. The view in Bristol Cathedral is a spirited and feelingly-treated glimpse through two of the new bays, showing the arcading; there is a freshness and accuracy in these sketches and their freely-handled backgrounds which place them in the rank of etchings. In a position of vantage is Mr. Street's interior of the new church at Kingston, Dorset (1101). This, unlike the last, is the work of another artist, and is a sombrely-coloured view in a sepia tone. There is a heavily-timbered roof, a very sharply-pointed chancel-arch, and the shafts of the piers to the arcading are in a dark-green marble. The drawing suffers from thickness of line and is hard in manner, with several defects in perspective.

Mr. J. M. Brydon's "View of St. Peter's Hospital, Covent Garden" (1048) must be noticed as an important building of brick, the style being Late Seventeenth Century. The building is broken by a centre, surmounted by a cupola; the gable is carved brickwork, but the width of this break scarcely satisfies us. End cupolas are shown. The façade is sensibly treated in a plain style, with moulded architraves round the windows. As an unpretending and cheap type of mission church, Mr. James Brooks's interior ink view (1047) is interesting. The treatment in brick is extremely simple, almost severe. There is a plain waggon vault with square brick splayed archivolts springing from circular stone pillars; the plain wall surface over arcade looks bare, though the author has introduced large clerestory windows, and the arcaded ambulatory adds to its pleasing character. No. 1054, "Proposed Catholic Church, Schools and Presbytery, Bromley," by E. Ingress Bell, shows a dignified gable front, pierced by a triplet of windows; a peculiar feature is the turret which is roofed back to the main roof, transept fashion. The church and house and the details are carefully and feelingly drawn in ink. We illustrate the drawing in our photo-lithographic pages to-day.

Commercial buildings are not numerous. Mr. Alex. Peebles' large ink drawing of façade for the premises erecting for the Life Association of Scotland in Pall Mall, shows a boldly introduced order, but the three-quarter Corinthian columns in the centre supporting a lofty attic, and the panelled and enriched corner pilasters, have rather a weak effect. An entresol arrangement is shown. Another important and more pleasing building in brick and terra-cotta, French Renaissance in style, is Mr. Alex. Graham's "New premises in Regent-street," for Howell and James, a facade we recently took occasion to notice; but this drawing of it (1107) inadequately represents the actual facade owing to the absence of colour. The balcony over entresol, the window mullions, and dressings, and dormer gables are in warm terra-cotta, relieved by red brickwork in the piers, and the effect is pleasing. The shop front is commonplace. Mr. Walter Hensman's "Business Premises, Manchester-square" (1112) is effective and simply treated as a warehouse front of un-

pretending character. The most masterly-executed coloured interior is No. 1055, showing "The Church of St. Peter, Southsea," as intended to be built (Mr. Alfred A. Hudson, architect). The drawing by Mr. Haigh is a work of art, and the architecture, full of French feeling in the details, shows the capabilities of brick to impart a monumental character. The lofty brick-moulded arches, supported by circular stone pillars, with the frescoes in the triforium space, together with the unique flat Gothic roof, indicate study of Continental detail in its more pleasing manifestations, and reflect credit on the architect. Nothing can be more pleasing than the manner the details and shadows are drawn. 1061 is another drawing of a church at Plymouth, by Mr. Geo. H. Fellowes Prynne, but spoilt by the restless fidgety ink-lines and confused shading. One remarkable feature are the figure-panels over the arcade, and the statues in niches in the clerestory. The detail is rather weak. Mr. F. C. Penrose sends a coloured view of St. Paul's Cross and the old cathedral, interesting as an archæological subject; as well as a better water-colour drawing showing "St. Paul's Choir School" (1116) as built. Mr. J. T. Micklethwaite's large ink-drawn interior of St. Hilda, Leeds, is weak in drawing, but is an extremely interesting study for a large parish-church. The style is very Late, verging upon what have been called debased types; the ceiling is elliptical and panelled, and there is a handsome rood-screen and some refined detail. No. 1100, "Design for a Church, Woodford, Essex," by Mr. E. E. Cronk, which church has, we believe, fallen to Mr. J. Fowler, shows a skilfully-treated tower and broach spire, and the end has some simple and effective detail. The drawing is sharp and clear, and is one of the best on the wall, and has been hung in a good position. Over this is a large view of "Scarborough Spa," by Messrs. Verity and Hunt. The drawing is in India ink, and shows a building of ambitious size and pretensions, with pavilion roofs and other Italian features, the design of which looks at least suitable for such a purpose, if we cannot call it refined art of the sort. G. F. Bodley and T. Garner show their recently-built "Master's Lodge, University College, Oxford" (illustrated by us to-day); Mr. F. W. Roper, his pleasing group of "Hospital and Almshouses," "The Rous Memorial, Newmarket" (1052), we have also given, in which English Classic details have been artistically introduced in the tenements; Mr. Roger Smith, a rather hard view of his "Hospital for Consumption, Hampstead" (1072). "Barrow Court, near Chester" (1073), by Mr. J. Douglas, is a large building, somewhat overcrowded in the detail, though good features are descernible; the different treatment of the gables appears hardly explainable. A few other well-known names are amongst the contributors. Messrs. Goldie, Child, and Goldie send a pleasing French Renaissance house with high-pitched roofs, spoilt by the metallic look of the drawing; E. F. C. Clarke is represented by a boldly-drawn "Church near Rotherham," broadly treated in the tower and low spire, and we might add to the list of those who have sent drawings, but prefer to notice a few of these more in detail next week, when we shall refer to the studies for decoration and to a few drawings of interest of old buildings. No one can visit the Academy and not see the rather arbitrary selection made in some instances, while not a few able men whose works we have been accustomed to look at year after year are entirely absent or have been excluded.

THE GROSVENOR GALLERY.

THIS year's exhibition at the Grosvenor Gallery opens with a choice collection of the works of that small but rising school of artists who have chosen the free and unconventional forms of artistic expression. The archaic and sentimental find more favour with many of these than the robuster and commonplace conceptions of art. It is true, indeed, we miss the work of Mr. E. Burne-Jones, whose last year's contributions were a feature of special interest; but there are numerous imitators who attempt to deal with similar themes, affect the same manner, and who give us Burne-Jonesonian proportions and countenances, and delight in the ascetic features and cool tones of that master. Yet, in spite of servile imitators, there will be found enough to justify the object the founder of this gallery had in view in promoting the aims of that select coterie who regard painting as a means of expressing the poetic and more elevated sentiment of our nature, and in transcending those rules of art which painters, from Raphael downwards, have followed, often, perhaps, with a loss of individual power and inventive freedom. On the large canvases of Sir Coutts Lindsay, Mark Fisher, W. E. F. Britten, G. F. Watts, R.A., W. B. Richmond, S. M. Hale, and others, we trace French influence at work, and the grey tones and sentiment of the French landscape school are even more strong than we have been accustomed to see in the work of Cecil Lawson and others. Figure-subjects and portraits make up the staple of the larger gallery. Mark Fisher's "Spring" is one of the largest and best landscapes: it has a strong "impressionist" feeling in the handling of the broad green sward, with its rich apple-blossom; and equally French in manner is H. R. Bloomer's quiet scene (8) "On the Banks of the Seine." Miss Clara Montalba is conspicuous in her grand and solidly painted "Dalmatian Boat" full of radiant sunlight and atmosphere, and her power of producing true poetry of form and colour out of the craft, with its yellow sail standing in midst of a quiet sea and sky in one blended breadth of luminous air, is remarkably shown. Turning to Miss Pickering's pre-Raphaelist picture "The Grey Sisters," an allegorical subject taken from Goethe's "Faust," we mark the wonderful likeness of the sisters to those types of women with saddened, wistful faces which Mr. Burne-Jones has made his own. The proportions of the figures are questionable, and the composition is too archaic and hard to enlist our admiration, in spite of much feeling, drawing, and colour. The largest, as well as, in some respects, the most important work this year is by Sir Coutts Lindsay, "The Boat of Charon." This colossal picture shows a boat being pushed from the river's brink, thronged with men and women, "the spirits of men depraved," in which the painter has embodied the passage in Dante's "Inferno" (third canto), where Charon ferries across the souls of godless men. The panic-stricken attitudes of the ghostly cargo, the struggling and despair of the men and women whom the passion of love has brought to perdition, are forcibly painted, while the flames on the horizon of the scene add to the ghastly character of the mission described by the poet. As a painting, there is much to praise; the composition, anatomy, and drawing of the figures, especially Dante and Virgil, on the shore, are masterly and scholarly, and, in character and colour, the work will rank, probably, as one of the best works of Sir Coutts Lindsay. Refined and sympathetic in treatment is G. H. Boughton's "Rose Standish." The grey tones and delicate handling, the figure of Rose in her "hood and sad-hued gown," and her sweet saddened expression, are quite in harmony with Longfellow's poem. Figure-subjects and portraiture occupy a large space on the walls this year. E. Barclay's portrait of Mrs. G. Bell Irving shows that lady in light scarlet costume, in the midst of china; T. Armstrong's subject (29) charms us for its figures and colour; and we may glance also at J. E. Christie's pleasing subject, "A Rose Among Thorns" (31) for its genuine English sentiment, good drawing, and delicate colour; Cecil Lawson's landscapes "In the Valley of Desolation, Yorkshire," and his view of "Wharfedale," both remarkable for their murky skies and bold, smudgy foregrounds, after the sentiment of the French "Impressionist" school, which has found favour with a large number of contributors to this gallery. L. Alma-Tadema, R.A., and Mrs. Alma-Tadema, both send specimens of their miniature paintings, the first a wonderfully-finished study of a classical Roman subject, "Ave Cæsar," illustrating the festival Saturnalia, in which the drawing of the architecture, the figures, and the marble paving are equal to anything ever done by this consummate master of technical skill and brilliant finish. "Sisters" is a touching study of two little girls, one bolstered high up on a bed, and the other tendering her flowers, extremely delicate in colour, and in Flemish costume. J. E. Millais, R.A., sends one of his poetically-conceived faces in "Sweetest Eyes Ever Seen," a little girl, with most expressive eyes, holding a basket of violets, standing against a dark bank. We pass on to notice Albert Moore's delicately-coloured "Forget-me-Nots," a maiden in light-blue drapery; and his equally poetic and symbolically-painted "Blossoms" (137) in the east gallery—a figure of a girl, clad in diaphanous drapery of light rose colour, standing against a background of blossom, both charming studies of graceful drawing and delicate luminous colour. The large cartoon facing the door, by W. E. F. Britten, "The Flight of Helen," is also in a decorative key of colour, and must be regarded rather as an unfinished picture, suitable for wall decoration. The chariot, with the beautiful Helen of Troy drawn by horses through the surf to the galleon, is conceived with much classical feeling. The colour is translucent, but the work is too crude and unfinished to admit of a fair criticism of its merits. This year G. F. Watts, R.A., sends another of those highly-appreciated groups of high-art figure subjects, which have long added to the interest of the Grosvenor. We cannot admire the gaunt figure of the youth seated on a ledge of rock in "The Genius of Greek Poetry"; but his "Endymion" is a masterly study, evincing original power and poetic feeling of the highest order, and his "Arcadia," a half-draped nymph, is a finely-handled subject. W. B. Richmond, whose portraits always draw admiration, has a handsome face (60); the deep green dress and Rubens hat are in good keeping, and this painter's other portraits are noteworthy for drawing and good colour. T. Armstrong's classically-composed subject "Female Draped Figure at Fountain" pleases more by its harmony and soft handling in a low key of colour. W. B. Gardner, J. Collier, R. B. Browning, are each contributors of works of merit; less satisfactory is G. F. Watts' mountain scene (72) "Carrara from the Leaning Tower of Pisa" in a hard dry impressionist style. A sketch of a lady, by E. J. Poynter, R.A., may be noticed; but the large picture by W. B. Richmond at the end of gallery, "Behold the Bridegroom Cometh," may be regarded as one of this painter's best achievements. The scene represents a temple portico of grey marble in the dawn of morning. The wise Virgins have their lamps trimmed, and are in watchful expectancy; but the foolish have fallen asleep on the pavement, or are lying prostrate over the parapet. The figures are well drawn, and the colouring is refined in tone, the low key of the greys, greens, and reds in the draperies being in excellent keeping.

Mrs. Stillman, in her "Willows of Tuscany," presents a figure with one of Burne-Jones's dreary, doleful faces, in a thoroughly pre-Raphaelesque style of treatment; and W. B. Gardner a fine study of "Autumn." The visitor will not fail to spare a passing glance at S. Matthew Hale's bright sunny picture of "Les Trois Princesses" (88), also in a pre-Raphaelesque mood, illustating a French romance; a cleverly painted portrait, by Sir F. Leighton, P.R.A.; a vigorous sketch in oils of an old man's head by A. Legros, and works by Emslie, D. Carr, T. Hines, and J. Collier.

In the east gallery we must particularly remark Miss Pickering's feeling, though intensely archaic, treatment of "The Angel of Death," a breezy landscape by P. R. Morris, A.R.A., and a large sunny picture by C. Napier Hemy of "Oporto." There is some quiet, cool colouring in J. E. Grace's "River Side"; and the same tone pervades T. Armstrong's "Flight into Egypt," thoroughly French in the handling. W. J. Muckley contributes two decorative panels of fruit-pieces (110 and 114), besides a panel, executed in gesso, of water-lilies and herons. R. W. Macbeth is shown by two quietly-painted figure-subjects. "September" is a poetically-treated figure-study, and the colour rich and autumnal. One work by J. M. Whistler, a portrait-figure of "Miss Alexander," is conceived in the sentimental grey tone of the French school, though there is little in the figure or accessories to draw attention. A curious legend is depicted by Walter Crane in "The Laidley Worm of Spindleton Heugh" (120), taken from an old Northumbrian ballad, which the painter has quaintly interpreted on his canvas. His symbolic study of "Europa" is less happy. E. J. Gregory's large half-length portrait (125), of a young lady in white satin corsage is conspicuously-hung, and the workmanship careful. Another, by W. B. Richmond, of a dark-eyed beauty dressed in sage green, sitting against an ebony cabinet, is more skilful as a study of colour and depth of tone. One of the best landscapes is J. Buxton Knight's "Late Autumn," broadly handled and showing much solid and effective painting, after the French manner; so also is C. N. Hemy's "Mill in the Gloaming." H. Herkomer, A.R.A., has taken rather a new ground in his "Gloom of Idwal," a very large, rocky mountain-scene, desolate in its gloom, with ruddy clouds over the black crest of mountain. There is much vigorous painting in the work, though lacking in interest. We need only stay to notice C. E. Halle's poetic composition "A Dance of Shepherdesses" well drawn in the graceful figures of the girls clad in transparent drapery of pale, delicate colouring, affecting rather the classic-idyl style; T. Armstrong's "Olive Gathering, Mentone," pre-Raphaelesque in sentiment, and cool in tone; and C. E. Halle's crudely-handled "Boar Hunt." In the vestibule are a few pictures by Mark Fisher, Miss Kate Prentice (a light sunny water-colour drawing of a bridge in New Forest); a delicately-finished figure-subject by Rosa Koberwein; a pleasant brightly-coloured picture by W. J. Hennessy, "Jocund Spring," with trees in blossom, and three merry-making girls; a deeply-toned sketch by G. M. Nicholson, in "Douglas Harbour" (189); a smudgy study of "Autumn" by R. S. Stanhope, and a vigorously-painted landscape on the South Downs, by Alfred Parsons, clever in the distance and foliage. The chief decorative subject is Mrs. Kate G. Hasting's "Finding of Moses," a balanced composition in which the decorative treatment has been mainly studied.

The water-colour sketches are few and unimportant. J. O'Connor sends, as he did last year, a few finished sketches, this time of Verona, and Lady Lindsay some clever studies of figure-subjects. R. Doyle illustrates, in his peculiar stippled manner, a series of sketches of an amusing fable, "The Sailor and Monkeys" and another study of a procession (251), in a crudely-coloured drawing, a humorous satire upon a "Triumphal Entry of the Queen." G. H. Barrable is the contributor of a nicely-drawn figure-subject, "Bashful"; and E. Bell in "Danaë and the Infant Perseus" in a boat on a green sea, a contrast of strong colour. Newton Benett's "Study in New Forest" is a highly-finished sketch in body-colour; "Storm Driven," also, is feelingly drawn by A. E. Emslie. This year Mrs. Stillman also sends another of her studies of Dante and Beatrice; the faces are those of the wistful types drawn by leaders of the school this lady accepts. A sympathetic figure-subject, by A. Neuhuys, and a large sunny landscape, "The Clyde," by D. Murray, may be noticed. T. Graham's "Spring Time" is bright and pretty, and the "Study of Nasturtiums," by P. Williams, and the sketches of Coke Smith, and especially Mrs. Naftel's "Old Court-yard, of Audley House, Salisbury," are each masterly in their way. Mrs. Naftel's last-named subject is a lovely sketch of an old Tudor doorway, with well put-in sunflower and weeds. As a whole Sir Coutts Lindsay's collection is well worthy of the repute this gallery has gained, and if there are a few works which indicate a pandering to the feeble sentiment of fashionable æstheticism, there are many more to justify the service the proprietor and director of the Grosvenor has rendered to the cause of Art.

THE WATER QUESTION.—VIII.

THE question of relieving lands from floods ought, in the first instance, to be considered acre by acre downward from the top of every hill, for the purpose of seeing whether and to what extent the excessive rainfalls may be prevented from descending into the valley too suddenly, and in what manner that should be done, should it be possible to effect the object by any such means; and if not, to see what provision is necessary in the valley itself, by way of removing obstructions in a river-course, or enlarging it, or limiting the lateral spread of the waters by embankments, or by a combination of the two latter means. The numerous deputations to the Local Government Board, of landowners whose interests are likely to be affected by the Bill now before Parliament, have set forth, and the same thing has been stated in the House on the second reading of the Bill, that it is a hardship to tax the upper lands in a river-basin for the benefit of the lower lands, or that portion of them liable to floods. The extent of land liable to floods is small in comparison with the whole area of a river-basin, and the objectors to the propositions of the Bill say that if improvements in valleys will pay, the owners of those lands will carry out the works required, and that if they will not pay it is unjust to tax the larger area for the benefit of the smaller. That would be so if the proprietors of the upper lands were innocent of contributing to the floods of the valleys; but, from a consideration of the following circumstances, it would appear that they are not so. The bed of the river belongs to the proprietors of the adjoining lands, as far as the centre from each side. It is curious, it may be incidentally remarked, that the bed of a river, which no one can see or touch, should belong to the proprietor of the adjoining land, but it may be so on the principle that it must belong to somebody, and, except the lord of the manor, there is no other person to whom it could belong, excepting also those cases in which it may have been transferred by Act of Parliament to another proprietary, and those in which, by another right, it belongs to the Admiralty Board, or to the Board of Trade, by transference to that department, that is, within the high-water mark of the tideway; but with these exceptions the river-bed belongs to the owners of the adjoining lands, and yet the proprietor of non-riparian lands uses the river-bed for the conveyance of water from his land to the sea, and that, too, without so regulating its flow as to prevent the lower lands being flooded by it. The Bill proposes to divide the lands of a river basin into three parts, lowlands, midlands, and uplands; but unless by lowlands is meant fen lands, or those which lie below high-water mark, it is difficult to see why there should be three parts, and why all lands above high-water mark should not be divided into two parts only—viz., those which are flooded, and those which are not so; and looking at the question in this light, there seems no great hardship in every acre contributing its proper rate. The proprietor of "uplands" is asked by the Bill to contribute one-sixth of the highest rate of other lands, presumably the lands most benefited, the rate for the midlands not being stated; but if, instead of dividing a river basin into three classes of land, it were divided into only two—leaving fen lands out of the question for the present, for they must be dealt with on a different basis altogether from the lands above high-water mark—there would seem to be a way of reckoning within the bounds of justice to all parties. Taking the uplands and midlands as one, for the reason that they are all above the highest flood level, they might amongst them contribute, say, one-half of the amount, the other half being paid by the flooded lands, and this would not require a contribution so much as one-sixth, as the following examples may show.

If in any river basin one-tenth of the whole area were subject to floods, and if the cost of relieving that portion from floods were £9 an acre, the statement would be:—

1 acre of flooded land	£4 10 0
9 other acres	4 10 0
	9 0 0

The average amount per acre to be paid by the other lands would thus be 10s., which would be one-ninth of the amount per acre paid by the flooded lands, and at 5 per cent. interest it would be 6d. per acre per annum. If only one-twentieth of the whole area of a river basin be subject to floods, the statement would be:—

1 acre of flooded land	£4 10 0
19 other acres	4 10 0
	9 0 0

And the average amount to be paid by the other lands would be a little less than 5s. per acre, or one-nineteenth part of the amount per acre paid by the flooded lands; and at 5 per cent. interest it would be 3d. per acre per annum. But it may be said that while this or that might be a fair average, acres differ from other acres in value, and that moorlands ought not to contribute so much as cultivated lands. If so, and no doubt it may be so, the nearest approach to an absolutely accurate basis is the rateable value of each description of land, the average of the whole amounting to the average rate required.

Neither would the flooded land be equally rated per acre; but in this case the proper basis would be the relative frequency of the floods to which the different parts are subject, as (1) to minor floods, which may occur every year; (2) great floods, which may not occur oftener than once in three years; and (3) the highest floods, which may not happen more than once in six years or a longer time. Where the records of the relative frequency of these floods in times past are not sufficiently numerous or accurate, an approximation by levels may be made, such as 8ft., 12ft., and

14ft., respectively, above the summer level of the river as a datum; and each level might contribute in something like the following proportions.

The lowest level	£6	0	0	per acre
The middle level	4	10	0	„ „
The highest level	3	0	0	„ „
Average	£4	10	0	

But this could only be properly adjusted after relative areas of the three levels of any case had been ascertained; and indeed the whole statement is but an indication of data. Much labour is necessary to be undertaken in each particular case, before the true proportions can be found.

It is not, however, agricultural lands only which suffer from floods; towns suffer greatly. The proper basis upon which they should contribute to the river conservancy fund would be probably the same as that for land, if they contribute at all; but the more likely thing for a borough, or a local board district, or the district of a town's improvement commission, is that the Corporation or the Board would themselves do what is necessary within their own boundaries to provide such a passage for the river as would injure no land above the town, that is, to make and maintain the water-level standard at the "upper boundary" of their district efficient for the drainage of all lands above that point. It would hardly be practicable to rate a town for any purpose requiring the fund to be expended beyond the boundary; it would not indeed be possible without an alteration of the law in that respect, but even if this were done there would remain the difficulty of an amicable agreement between the town authorities and the general conservancy board on the proper contribution of the town. As the free flow of a river through a town is much obstructed, it is undeniable that towns should contribute in greater proportion, if at all, and should at least keep down the water level at the upper boundary so as not to flood the land above the town; but besides this, the water flowing from the town area increases the floods in the river at the lower boundary to a greater than an average degree per acre of the drainage area. The water supply brought into the town by other means and from another source runs into the river through the sewers; but its proportionate volume to that arising from a heavy rainfall is very small, being that of the dry weather flow of the sewers only; but the same depth of rainfall upon an area built upon contributes a greater quantity of water per minute to the river than does an equal area of agricultural land, as it runs off more quickly, and therefore the town is justly liable to a proportionately greater rate of contribution per acre of its area. The proper proportion would be, that between the rate of flow off the ground from a given depth of rainfall on a steep hill side of hard and impermeable rock, and that from the average of all the land in a river-basin, because, whether the town be hilly or flat, its surfaces throw off the water quickly; and if that proportion be regarded, it would be, say, as 18 (12 to 24 cubic feet per minute per acre) to 1½ (1 to 2 cubic feet per minute per acre) or as 12 to 1.

But the municipal authorities would prefer to do at their own expense what is necessary within their own boundaries. Where, however, land is built upon in rural districts—as in the case of small towns in rural sanitary districts—the same principle is applicable, although the proportion may not justly be the same, because the ground is not so completely built upon, on the average of the town area, as it is in large towns, and therefore, the volume of water contributed to a river from a given area under a given rainfall is proportionately less, and might, perhaps, be not unjustly stated at one-half that of the other case, and if so, the rate per acre of contribution to the river conservancy fund would be 6 to 1 of the agricultural land in the same river-basin above the flood-level. But perhaps the basis of rating towns which has been proposed by Mr. J. Bailey Denton would more accurately meet the case.

In respect of the higher lands of a river-basin, however, the great question of all is whether some means of regulating the flow of the excessive rainfalls off the ground cannot be adopted, which would change the whole question from one of aid to the lower lands to one of absolute benefit to the proprietors of the upper lands; whether, as the rain first descends upon them, they may not be enabled to exercise their prior right in the possession of the water; and if the adoption of such means should be of no greater benefit than would be equal to the liability to contribute to the freeing of the lower lands from floods, it would at least dispose of the difficulty of terms of contribution. But, in fact, it would do a great deal more.

A large river-basin contains within it hills, not usually so high as the main watershed, but still of considerable height, along the tops of which lie the watersheds of the minor rivers and streams. The ground is as various in character as the several geological formations—some hard and igneous; some which, although of sedimentary origin, have been changed in character by contact with igneous rocks; some more slaty and others containing more clay; others again of limestone, and some of sandstone and shale; some of chalk, oolite, and lias. Accordingly the hill-sides of a river basin are various in the character of the surface; in one case it is pretty even and descends to the valley almost in one unbroken slope; in another it is broken up into ravines; and in others the chief feature of the river-basin is a number of tributary streams on which proper sites for storage reservoirs exist. It has been strongly insisted upon that it is impossible to prevent floods in rivers by the construction of any reservoirs whatever, but that cannot be wholly assented to, although for the larger part of the area of any river-basin it is true. For instance, in 1,000 square miles—to go no further, although some of the river-basins are much larger than that—there are 640,000 acres, and assuming 10 per cent. to be subject to floods, there would be 576,000 acres above flood-level; but it is only the higher parts of this area which could be dealt with by storing or regulating the water flowing from them; that from the larger portion of the area must continue to flow directly to the river and larger streams. But, looking broadly at the question, the river may be said to be equal to its duty of carrying off the water which comes to it, and it is only the top of the flood, as one might say, which needs keeping back for a time until the river has begun to subside, and it may not be impossible to do this on the higher portions of the area, though not necessarily, for this purpose, on the highest, as is the case in waterworks reservoirs.

When an engineer looks for a site for a storage reservoir, or perhaps for several reservoirs, for the supply of a town, the elevation must be sufficient, and in general must be great, the best water being usually found at the greatest distance, and a great distance requires a correspondingly great fall in the conduit; and as for economy, there must be only one conduit to supply all parts of the town, high as well as low, the choice of site for a reservoir is very limited, and is usually found only within some few thousand acres of the upper part of a river-basin, and not far from the main watershed. But the same difficulty does not arise where the object is merely to control the flow of a bulk of water so that its discharge may be gradual, and prevent the river overflowing, for as relative elevation need not be regarded, a wide range is afforded for the choice of sites for reservoirs; and, moreover, the control of water may be managed in a different way from that of the construction of reservoirs properly so called, in those river-basins where the geological formation and the character of the surface are favourable.

There are two respects in which the regulation of the flow of excessive rainfall off the ground is to be regarded: that of absolute storage for a considerable length of time, and that of merely regulating the flow, or controlling the water until the flood in the river has begun to subside; and we will offer a few remarks upon the practicability of this, presuming that the owner of these high lands will have—if, indeed, already he has not—power to make such charges for the use of water as will be sufficiently remunerative, or, at least, will be equivalent to his liability in the matter contemplated by the Bill now before Parliament.

ROYAL ACADEMY LECTURES ON ARCHITECTURE.*

THIRTEENTH-CENTURY ARCHITECTURE—ENGLAND.

(*Concluded from p.* 480.)

ANOTHER element in the formation of our English style which has to be borne in mind is the nature of the most available stone. Undoubtedly the Caen stone-quarries exercised great influence not only in Normandy, but equally in England, to many parts of which it was cheaper to bring that stone by water than to obtain native stones by land-carriage. And to some extent, at least, the mason follows the stone. In France, Caen stone was by no means so much used. Out of Normandy it is very rarely seen; for, in truth, there it had to compete with local stones in all parts, and, as the land-carriage was a great difficulty, it was not used at any great distance. The masons who developed a style at Caen had much less effect, therefore, naturally, in France than they had in England. Their stone was used in London, in Dublin, all along the south and east coast of England, and, in short, wherever water-carriage was available. Its texture allowed of the most delicate workmanship being seen to the greatest perfection, and I think I never have seen or used a stone which seems so loudly to call on the mason to exercise his skill, wholly unlike the coarse stones which are so common in other parts of France, and which seem to make the best and most polished workmanship to some extent a waste of labour. The 13th-century buildings in Normandy, thanks to this stone, are extraordinarily rich in delicate mouldings, undercut with the greatest skill, and producing the most intricate and charming effects of light and shade, and in almost all respects just such as are used in our best English buildings of the same period. In England not only was Caen stone largely used, as I have said, wherever water-carriage allowed of its being easily landed, but in various districts stone was to be found which admitted of the same kind of workmanship as Caen stone. Each cathedral grew, and the best buildings were erected, in the neighbourhood of some stone-quarry, which supplied ample material. Salisbury was built from Chilmark, Wells from Doulting, Peterborough from Barnack, York from Tadcaster, and so on; and in all these cases the stone was of fine and good quality, and admitted of finished workmanship, nearly equal to that which the masons employed in the Caen district.

English architecture in the thirteenth century was launched on its course with its own national peculiarities in ground-plan, in the shape of the capital, and in the practice of the art of moulding as one of the main modes of decoration to be made use of, and, at the same time, with what I am almost obliged to call an indifference to the sculptor's art. The examples of thirteenth-century sculpture are not such as one can venture to compare for an instant with those grand arrays of figures and subjects with which the French churches were so profusely adorned.

* By Professor G. E. Street, R.A., F.S.A. Sixth and concluding lecture of the course, delivered on Thursday, March 3.

The west front of Wells cathedral is the finest example we have, and the execution and design of the subjects and statues here is, in many respects, admirable, justifying Flaxman's statement that "in parts there is a beautiful simplicity, an irresistible sentiment, and sometimes a grace, excelling some modern productions." Close upon Wells followed Salisbury, less fortunate, however, in that a larger proportion of the ancient statues have been destroyed or have decayed. But even in these cases the sculpture plays a remarkably subordinate part. It more or less extends over the whole front, and yet it nowhere overwhelms or interferes with the architectural lines. These are as defined as possible from the base to the summit, and are almost as predominant where there is sculpture as where there is none. Crowland Abbey—now, unfortunately, in ruins—the south transept of York, Dunstable Priory, the west front of Ely, had all of them sculpture introduced in the same fashion. Statues standing on corbels under arcades in the walls, and subjects carved in spandrels or in the tympana over archways, as in the north door at Salisbury and the west doorway of Higham Ferrers, are features in the decoration of all these churches. The south doorway of the choir of Lincoln is almost a solitary example of a doorway with sculptured statues on its piers, its jambs, round the orders of the arch, and in the tympanum between the arches of the doors and the enclosing arch. Even here, if you compare it with recent French work, you will be struck with the modest proportions of the whole, and with the extremely well-defined character of the architectural lines which inclose and keep in due restraint the exuberance of the sculptor. In what is, perhaps, the most poetical conception in England, the west front of Peterborough, it is not until the three magnificent arches are completed, with all their well-ordered and chastely-simple array of shafted jamb and moulded arch, that the sculptor has been allowed to fill the gables and the spandrels with an array of statues in niches, capable, possibly, of some religious interpretation, but not near enough to the eye to be criticised as works of art, and only serving for the general decoration of the gables in company with rose-windows and arcades and mouldings. If, however, in sculpture used as a decoration of architecture England is somewhat wanting, this cannot be said of sculpture as applied to monumental effigies, or of the work of the stone-carver in the humbler decoration with foliage of the capitals and other members of our buildings. In these English buildings are rich, and the refined and delicate beauty which was so evident in them is equally evident in their decorations. The carving of foliage is perfect in its arrangement of the masses and in the beauty of form and line which marks every part. It has far greater variety than French work of the same date, and trusts more to perfection of treatment throughout than, *e.g.*, to the somewhat violent, if vigorous, treatment of the usual French capitals. The detail of foliage develops gradually throughout the century, from the Transitional carving of St. Joseph's Chapel, Glastonbury, to the beautiful adaptation in some cases at Wells and St. David's of Romanesque outlines, or by Salisbury, Ely, Lincoln, and York till it culminates in such admirable and truly architectural treatment of natural forms as we see towards the end of the century in stone in the chapter-house at Southwell and the passage to the chapter-house at York, and in wood in the stalls of Winchester Cathedral.

It is time now to do as I did in speaking of French architecture, and to say something on the way in which the English architects did their work in some two or three typical examples. None, I think, are better for our purpose than Wells and Glastonbury on the one hand, and Salisbury on the other, both of these cathedrals being wells of English undefiled, and illustrating two different modes of treatment,—decoration of the structure by the shaft and column in the one, and by moulding and masonry in the other.

At Glastonbury, St. Joseph's Chapel is of supreme interest. In the delicate beauty of its detail, it is worthy to be compared to the chapter-house of St. George's, Boscherville. The excellence of every portion is equally incontestable in both, and there are some points of similarity in the two works which can rather perhaps be felt than described. The chapter-house was built by Abbot Victor, who was abbot from 1157 to 1211, and its date is, therefore somewhat uncertain. The date of St. Joseph's Chapel, on the contrary, is most exactly defined. The wicker church, on whose site it was built, was burnt down on the 25th of May, 1184, and the new chapel was dedicated on the 11th of June, 1186. At this period, then, we see a building in which the architectural features are, in part detached columns with caps and bases; in part mouldings of masonry continuous round jamb and arch. The great north door illustrates this: two of its orders have shafts, with capitals and bases; two, continuous lines of carved ornament. The buttresses all have engaged shafts at their angles,—*i.e.*, shafts worked out of the masonry, and not detached nook-shafts. The groining shafts, like those to the buttresses, are all pointed in section,—*i.e.*, they have a sharp line up the centre of the face, and the same feature is repeated in the mouldings on the western turrets. The great abbey church to the east of this chapel is all but destroyed; but what remains shows that its designers had advanced in style, but had retained many of the peculiarities of St. Joseph's Chapel. The engaged shafts in the buttresses, with the sharp centre, and the system of continuous moulded columns; instead of detached shafts, is carried still further. What is more singular, is that the wall-rib of the groining is carried up from the window-sills, and returned round them also. Thus you will see that the whole scheme is one of moulded stonework, as opposed to a system of columns or combinations of detached shafts. At Wells the same system is seen. The cathedral was built during the episcopate of Jocelin Trotman, who was consecrated in 1206, and who died in 1242. From 1208 to 1214 he was in France, having been banished for taking the Pope's side against the King. Jocelin the Englishman, as he was called, knew all about the French art of the day. He was present at the laying of the first stone of Reims Cathedral in 1211, and he saw Notre Dame completed, and no doubt many others of the great French churches in progress. But even if he admired them, his English sense made him, or else his English architect was, as far as any one could be from choosing merely to repeat anything that he saw, with the one doubtful exception that to a certain extent he retained the square capital. The nave piers show us in perfection what we see only in ruins at Glastonbury. They are masses of masonry, built up of eight clusters of triple shafts carrying alternately octagonal and square capitals, and on these arch mouldings of three orders, two of which are planned on the chamfer and one on the square. Above the triforium is a long arcade, three to each bay, of moulded members, continuous round jamb and arch, and above this a clerestory, modernised, it is true, but with no sign of ever having had any inside shafts or any string-course or abacus at the spring of the arches. The groining is carried upon a triple shaft built into the wall. Everywhere the detail of moulding and carving is admirable. And the effect of the modest dimensions of this little church (the nave is only 37 feet wide from centre to centre of the columns, and about 66ft. high), insignificant as they are in comparison with those of the great French churches, is nevertheless very beautiful and harmonious in all points of view. The groining is supported by flying buttresses under the roofs of the aisles, but there are none above them. The clerestory wall is, indeed, very thick, and only moderately pierced with windows, so that the construction is as unlike that of the examples in France, of which I was speaking in my last lecture, as it well can be. I ought, perhaps, before this, to have said that the north porch and the west front and western steeples are in a wholly different style from the work I have been describing in the nave and transepts. The one is probably of earlier, the other of later, date, but in both the detached shaft is used as freely as possible in opposition to the style of the nave, where its use may almost be said to have been prohibited.

The influence of Glastonbury and Wells, or of the Doulting masons and architects—whichever it was—did not end here. Throughout Somersetshire, when you come upon a piece of 13th-century work, it is generally in the same style. The same style is conspicuously visible at Llandaff and at St. David's, and seeing that St. Patrick was buried in Glastonbury, it would not be unreasonable to look for some evidence of its influence in Ireland. But it was the course of conquest more probably than of pilgrims which led to the introduction of Glastonbury art into Ireland. Strongbow's invasion was a South Wales invasion, and everywhere within the Irish Pale we see the architecture suddenly changed from the old Irish style to one which has the most definite evidence everywhere of its Somersetshire origin. In Christ Church Cathedral, Dublin, for instance, we see the same triple shafts, the same combinations of groups of them to form columns, the same alternation of square and octagonal caps, the same fondness for the engaged column with an arris or edge formed up the centre of its face, the same general proportions, the same carving of foliage, and the same love of continuous mouldings. Kilkenny Cathedral, Kildare Cathedral, and others show the same features as Christ Church, Dublin, and at Killaloe, and constantly in Irish examples we see the feature shown at Glastonbury and at Wells, and rarely elsewhere—the mouldings of window-jambs returned round the sills.

Interesting on all these grounds as the church at Wells is, I have selected it for notice to-night not only because of its specially English character, and of the influence it exercised, but because it presents, in a marvellously perfect condition, the whole group of attached buildings which makes up the complete English cathedral establishment, and which are so rarely seen remaining and still in use anywhere on the Continent. Among them are the chapter-house, the cloister, the bishop's palace, all containing considerable portions of the 13th-century, besides a marvellous collection of Later Mediæval buildings.

The chapter-house was begun rather late, and its crypt only can certainly be said to be of our period. This is of special interest, as showing that although our English architects liked a square east end, they had no sort of dislike to a circular building, and the plan of the crypt, with its central column under that of the chapter-house, the eight detached shafts which surround it, and the planning of the groining with none but triangular bays, will have much interest for those of you who followed me in my remarks on the planning of the chevets of the French churches. The bishop's palace is not less interesting. It, too, was built by Bishop Jocelin, and agrees in style with the Later shafted work of the west front. Its lower stage is mainly a long groined chamber subdivided by walls and partitions and above this, on the first floor, a long gallery lighted by windows, which illustrate well a favourite development of the men who built the west front. They not only began to make their windows more decorative by joining lights together, but they gave them cusped internal or rear arches. By cusped arches I mean arches which are formed of a series of curves without any inclosing arch; these occur frequently in the west front, in a doorway in the cloister, and in various windows in the palace, wherever one meets with the work of this second school of Wells architects.

From the simple Early Pointed work of the palace one goes on to the slightly later work of the chapel, and thence to the magnificent ruin of the hall, at each step finding the development of the style more advanced, till, in the last, the work of Bishop Burnell, at the end of the century (1274—1292), we have the complete change effected to the Middle Pointed style. Nowhere, therefore, can you see better than here the gradual change which the century saw completed. At the beginning we have the work of an architect whose great idea was to make his work solid, and yet as beautiful as possible, by the simple use of well-designed mouldings, of groups of moulded shafts for columns, and by the simplest use of the pointed arch. Then, probably, before the west front was begun another man came upon the scene. The first man had cared nothing for what was being done at Salisbury. He had been not only English but Somersetshire to the root. His successor thinks this line a mistaken one. He admires what the Salisbury, the Lincoln, and other English architects were doing, and covers his west front with arcades or arches, all carried on detached shafts, and enclosing the figures and statuary of which all Englishmen are or ought to be so proud. His influence is evident also in the bishop's palace, and to a less degree in the great dining-hall, where the windows have still

internal jamb-shafts; but in the end the early system is practically accepted again, and almost all over England, in the 14th century, the system of moulded and clustered solid shafts and continuous lines of arch and jamb moulding which had been first brought to perfection in Wells, was accepted as the best and universal rule.

Something must now be said of one of the great examples of the other system, and we can hardly do better than see the effect it produced where, as at Salisbury, it is carried all through a building, instead of being, as at Wells, confined only to one front. Salisbury Cathedral was built from the ground on a site never before occupied. The first stones were laid on April 28th, 1220. In 1225 some altars were consecrated, and in 1229 Bishop Poore, the founder, died, and in 1258 the cathedral was consecrated. By this time, after 38 years' work, we may assume that the church was practically complete. It was later in its foundation, probably, by some half-dozen years than Wells. Bishop Poore and his architect—Elias, of Dereham, probably—had no sympathy with the system of design pursued in the nave of Wells. The Isle of Purbeck was in the diocese, and there was every reason, therefore, for indulging as much as possible in the use of its beautiful marble. The introduction of detached shafts wherever possible, and which follows naturally from the use of marble, wholly changes the character of the architecture. The effect is admirable; but, on the other hand, the risk in construction was great. The variety in the plans of the clustered columns at Salisbury was very great. In the nave the common French section of a circular column surrounded by four smaller shafts is adopted, and here the shafts are detached from the centre column. In the choir the columns are surrounded by eight detached shafts. In the doorways and windows shafts are placed in various ways—in clusters and one behind another—so as to produce very deep effects of light and shade, with the advantage that, all the lines being curved, the transition from light to dark is never too abrupt. In the Lady-chapel this system culminates. The width is subdivided into three aisles, and the vaults are carried—one is almost tempted to say appear to be carried—on shafts so long and so delicate and frail as to have required the very highest skill to insure their standing, even during their construction, let alone standing as they do 650 years after their erection! The architect throughout the cathedral dispensed, as did the architect of Wells, with visible flying buttresses; he used them only under the roofs of the aisles, but in order to make the thrust on the walls less, he built his vaults with stone ribs, filling in the spaces between them with concrete made of a very light calcareous tufa. He used an unnecessary thickness of this material, but as it was extraordinarily light, his construction was generally perfectly secure, as in two or three places only has it been found necessary in later times to add flying buttresses above the aisle roofs. Beautiful as the detail of the cathedral is, there is generally some sense of disappointment in its interior. Unfortunately, it is a church full of windows, and the grisaille with which these were filled is almost all destroyed. Its roofs and walls were richly coloured, and the only portion which remained has been restored, and is no longer at all like the old in its effect. The painters, as at Chartres, painted the outside work in places, as, e.g., in the west porch and the porch to the chapter house. In other places, as, e.g., on the concrete groining of the porch and of the nave and on the walls of the cloister, they coloured the walls and then marked them out in imitation masonry lines of red colour. The ground-plan of this great church is one of extreme beauty. It has not only the usual transept with an eastern aisle, but to the east of this a second and shorter transept devised evidently in emulation of the eastern transept of Canterbury, which itself was no doubt derived from the great Benedictine abbey church of Cluny, now destroyed, and before its destruction the only church in France in which this beautiful arrangement was seen. This eastern transept has also its aisle on the east, and is of less width and proportion than the great transept. East of the choir are three lower chapels, in which are the delicate arrangements of clustered and single marble shafts which I have already referred to; and it was in the side walls of the central of these three chapels that, before Wyatt's so-called restoration, there remained an arcade which, for perfection of design and execution, has never, I am bold to say, been surpassed anywhere in Europe. It is now built into the west wall of the eastern transept, and will ere long, I believe, be seen again in its old place. If it is possible to say so much of the interior, what may we not say of the exterior? With one exception,—the destruction of the detached bell-tower, which stood in the churchyard till Wyatt's time,—the church is now more beautiful than it was when it left its builder's hands. Elias of Dereham might well deplore the changes which men have made in the colour of his interior. But could he see it again he would be amazed with the beauty which time has given to the exterior. There is, so far as I know, no building in Christendom on so grand a scale, which is so complete, so uniform in style, so good in the proportions of the various parts to the whole, and altogether, and from every point of view, so thoroughly beautiful, as this grand and most English church. Its surroundings are as beautiful. The quiet close,—unknown out of England,—surrounded by deanery and prebendal houses, by a bishop's palace founded at the same time as the cathedral, the whole group surrounded by its ancient wall, and entered by its old gateways, is in itself a sight for an architect; but out of the green sward which surrounds it on all sides the matchless church rises, with its beautiful cloisters, its splendid polygonal chapter-house, its octagonal vestry on its southern side, in such completeness of grace and beauty as leaves nothing to be desired.

Like Wells, Salisbury is a cathedral well worthy of a young architect's study above most others. For not only will he find there the work of the mason in all its varieties; he will find, too, woodwork of all sorts, moulded, carved, and plain,—roofs, doors, chests, tables, choir-stalls, even the great wooden wheel which was used to raise the stone for the steeple; and in every portion he will find evidence of the same sense of the necessity for completeness, which is the true mark of a good architect at all times. The detail everywhere is admirable. The carving of foliage is very different from, though in my opinion generally inferior to, that at Wells, and there is one very singular feature which is seldom seen in England. The arcades of the parapets, and in many other places, are carried on quite regardless of the buttresses which intersect and stop them. So that *e.g.*, in the front of the transepts, there are arcades not regularly divided, but quite accidently arranged with half or a third of an arch abutting against a buttress, so as to give the appearance of the buttress being an after-thought put on against the arcade.

I should have liked to take you on to the other great thirteenth-century churches, to talk to you about Archbishop Walter Grey's magnificent work the transept of York, and to compare this with his work at Southwell. I should have liked to show what Saint Hugh, and, after him, Jocelin of Wells's brother, Hugh of Wells, bishop of Lincoln, did so exquisitely in their glorious minster, and, above all, to have seen what that great Yorkshireman, Henry Murdac, once monk of Clairvaux, then abbot of Vauclair, then of Fountains, and afterwards Archbishop of York, did in the magnificent abbey, so much of which still remains in the beautiful valley of the Skell; how at Fountains he built at first in a French style, and how, as elsewhere, gradually the English art re-asserted itself. But, after all, the story is much the same everywhere, and the superlative interest of such an abbey as Fountains is in the insight that it gives us into the domestic architecture of the period. The more one sees of it the more does one discover that in those good days there was no such distinction between domestic architecture and ecclesiastical as has sometimes been supposed to exist. The same details that were applied to one were thought suitable to the other; it was the best construction and the most suitable arrangement, the most beautiful proportion, the most delicate moulding of stonework, the truest system of carving of foliage, that were everywhere seen, whether the work to be done was for a house or a church, for a monastery or for a castle. The work in the great hall of the castle at Winchester is as good as that of Bishop de Lucy at the same time in the cathedral. The castle at Chepstow is as good, and in the same style, as the abbey at Tintern, and the hall for the layman at Acton Burnell is on the same lines as the hall which Bishop Burnell built at the end of the thirteenth century in the palace at Wells. No more pernicious doctrine has ever been inculcated than that which supposes one sort of art to be sacred and unfit for use for secular purposes. The best art is that which is fittest for the first purpose, and I suppose we all agree that we should, if it were possible, like to have it for the other also. This is the lesson of the thirteenth century, on which so much remains to be said that I am distressed to think how inadequately I have been able to say, what, with more time, I hope I might have said in detail on the subject. It was impossible that in an hour all could be said that might be; and it seemed to me that there would be more chance of saying something new to you if I took a somewhat similar line on the development of styles in the best periods in Italy, France, and England, than if I tried to show you exactly how they differed one from another in each detail of their work, and exactly what those details were. It is my fault if I have failed to show you how interesting the study may be made if you pursue it with something beyond the mere daily drudgery of attention to business. The other arts hardly afford the young student a tithe of the pleasure or the profit from such studies which everywhere throughout the civilised world attend the earnest student of architecture, and my last words to you for this year are, that you should regard the addresses which I have given as being entirely meant to be suggestive of further lines of study and investigation by yourselves. And I end as I began, by impressing on you that no one can become a good architect who does not earnestly study what men have done before, who has not enthusiasm for his art to make him long and resolve to do nothing but what is good in its practice, and who is not ready to show that he has enthusiasm by the industry which surely attends it, and without which no study, no lectures, and no schools can be of any real service.

THE BUILDING ARTS OF INDIA.*

By General MACLAGAN, R.E.

EVERYONE who has been in India has had opportunity, at some time or other, of taking notice of the buildings in the places at which he has had to take up his abode for a time. He may, indeed, be often in places where there is not much to be seen. The ordinary dwellings of the people will not in India, more than elsewhere, present much that will be thought worth observing. Yet, even in the simplest of dwellings, one may see how much can be made of very slender local resources, and how well, under the guidance of ancient custom and personal experience, they are turned to account. When you hear of cottage-walls made of mud it does not sound nice to English ears. But, when you see it, you find it is something better than you thought. Put together solidly and thickly, it becomes one mass throughout, and, hardening as it dries, it forms a compact and effective protection against heat and against rain. In greater mass, this simple material forms the very efficient defensive works of what are well known as mud forts in India. How simply, also, do we find roof protection supplied by a skilful use of the common reeds and grass that grow in the jungle (jungle, let it be observed, is the familiar name both for forest and all uncultivated waste, which, except in driest tracts, commonly becomes a wilderness of shrubs and thorny trees and tall grasses). A roof covering of reeds, of no great thickness, does not truly afford much protection against the sun, and will not exclude the heaviest rain; but it is very wonderful to see what it can do. At places in the hills, you shall see local material of another kind turned to account for roof covering, in a cheap and effective way; large flat slabs of easily-split stone, doing duty as slates, with lumps of rock laid upon them to hold them in their place. In India, as in most other countries, there is something worth noticing in the way in which the simplest of available means and materials are turned to account in very simple ways. In India we notice next something more. When we get above the very lowest and poorest kinds of human habitations, we begin to see manifested a demand for some ornament. The ornament may be of a very rude character, but there it is. Something is wanted

* Part of a paper read before the Society of Arts, April 29.

more than that the building shall serve its direct and essential purpose. You may find ornamentation given in colour or in wood-carving. The white-washed door-jambs may have streaks of ochre, diversified with curved lines and spots, and sometimes more ambitious efforts of the owner or the village artist. But there is something of a higher class in the rough carvings of the lintels and the door-posts of houses in even lowly, unpretending villages. Rough carvings, no doubt, they often are, of simple waving lines or geometric patterns, after the fashion of greater and more elaborate work in large cities. They are very unsymmetrical, perhaps, and very uneven. But this is nothing; the eye does not care to be critical in looking at these things. The ideas and aims are good, if the execution is something rustic. Rustic or not, the effect is very pleasing. It admits of variety of treatment, and the treatment rises to various degrees of excellence. But the great thing is that it is the expression of a felt desire for something more than mere needs. A something pleasing to the eye has become a need, and it finds, in its simple way, on the spot, the art that is capable of satisfying the demand.

There is often a sort of idea that one must go back a great way for specimens of excellence in various arts, and, among these, the arts connected with building. In India, as elsewhere, people have been in the habit of saying that no such buildings are erected now as in the days gone by, and that certain old arts are lost. It has been concluded that the capacity for such work has died out. It is one phase of the idea prevailing in all ages that former times were better. It may be the case that we cannot point to anything in India, built within the last hundred years, to equal the grand Hindu temples of Tanjore, the Jain buildings at Abú, the Taj Mahal at Agra, the Jama Masjid at Delhi. The occasion for erecting such buildings and the means are wanting. We are not warranted in adding, also, the ability to design and to execute them. It is almost needless to say that for great and beautiful buildings, great expenditure of money and labour is required. It was perhaps a stern necessity that stopped the second tower alongside the stately Kutb Minár at Delhi, and the second tomb opposite the Taj, and elsewhere left intended works unfinished. The ability was not wanting, but the means.

We are not fully able to say where the earliest building arts came from, of which we see the illustrations in India. There is nothing to show that any distinctive art of this kind was brought in by the intellectual race which, at a remote age, entered India from the north-west, and gradually extended southwards over their new country. There is reason to believe that they found architecture among the people of the south. In whatever way acquired, the Hindus have shown a very admirable power of forming a style, and working it with great variety of treatment, and great beauty of detail, though not always equal soundness of construction. No special reference is made by the historians of the Greek invasion to fine buildings in India at that time. But the mention of Taxila as a great and magnificent city, seems to tell of buildings at that place which were of some importance. And now we have there only the ruins or traces of numerous small Buddhist topes; and a few other remains, which are undoubtedly Greek.

Muhammadan architecture, which came in from the West, assumed more graceful forms in India than it had done in Persia. It developed other forms again when it travelled westward, and took root in Spain. Moreover, in India it adopted, in the time of the Emperor Akbar, and under the influence to some extent of his enlarged and liberal views, Hindu forms of ornament, as well as of construction, in works distinctly Muhammadan, and this in a manner very effective and beautiful. And, similarly, in many parts of India, we find Hindu buildings of recent centuries adopting, with more or less success, Muhammadan forms of constructions, with corresponding ornament. They would appear to have something in common, in their fundamental ideas, which allows of these adaptations without marked fault. It is otherwise when we see Oriental forms trying to adopt Italian features, as at Lucknow, where, in some cases, the mistake is aggravated by the effort to make a good show with inferior means.

The dome and arch, borrowed by some modern Hindu buildings, are foreign to pure Hindu work. The construction was unknown to the earlier Indian builders. A well-known illustration of this is to be seen in the great gateway of the Kutb inclosure at Delhi, built in the earliest Pathan times. The arch-shaped entrance is not an arch, but the form is given by horizontal courses of stones projecting one beyond another, till they meet. It would appear that Hindu workmen, unacquainted with the arch construction, were employed to execute the work to a prescribed arch form. The same thing is to be seen in a covered passage at the ruins of Ránigatt, a Buddhist fortified monastery, a little beyond our Yusufzai frontier, to the west of Torbéla on the Indus, above Attok. Likewise in some old bridges in Orissa. The high pyramidal roofs of Hindu temples in the south of India have a dome-shaded crown, which is not a dome. It is scarcely necessary to say that the large Buddhist *topes*, the large buildings of the beehive shape, now pretty familiar from drawings and photographs, are not domes, but are formed on a solid core.

One of the most observable things in connection with the best of the old Hindu buildings and groups of buildings, is the attention that has been paid to choice of site, and the admirable skill with which the choice has been made. We admire the way in which English abbeys and monasteries found out lovely sheltered spots in which to plant themselves, in green and peaceful valleys of our own land. No less happy has been the success of the Hindus in the choice of situations for their buildings. Temples, in shady glens and on wooded hill-sides, have been placed where they have beautiful back-grounds of crag and forest, of rich colour and of varied foliage. Such are numerous Hindu buildings, small and large, in Central India and Southern India, in Rajputana, in Kashmir, and elsewhere.

It is noticeable that Buddhist buildings, monasteries, temples, and topes, or relic monuments, are many of them built on the open plain, even in the neighbourhood of better ground, with no reason that is now apparent for the choice of their position. Other buildings of the Buddhists occupy, like those of the Hindus and the Muhammadans, commanding sites which seem to have been carefully selected. Some, at least, of those which stand on what we might be disposed to think chance sites, are connected with incidents in the traditional life of Buddha, which may account for the exact position in which they are built. And others probably have a similar history.

Our building predecessors in India did not meddle much with the large rivers. They had to build some defensive walls and terraces on their banks. Bridges, of course, they did not build across such rivers. Never till railways brought their demand for a continuous running line did the British Government attempt anything more than floating-bridges on these rivers in the plains. And when we consider the character of the rivers and the requirements of a permanent bridge, we have no reason to be surprised that even the wealthy Mughal princes and their engineers did not apply their strength and skill to works of this class, and were content, as their predecessors for many centuries had been, to use boats. The pier foundations of one of our railway bridges were scooped away by the stream, at a depth of 70 feet below the river-bed. Another of these rivers, at a place where a railway-crossing is being built at this present time, has been known to rise, in exceptional floods, upwards of 90 feet above its low-water level. We can feel, in the face of facts like these, that it was right to let the permanent bridges wait till the days of railroads.

Over swift and rocky rivers in the hill country, which it was necessary to cross by a single span, suspension bridges of hempen ropes or cables made of birch-twigs have long been in use. On roads where laden cattle were used, something different was required for crossing the rivers. The kind of bridge called *sanga* in the northern hills is a good and useful construction, for which the materials were commonly available. A number of beams, laid side by side, project from each bank of the river, slightly pointing upwards, firmly secured by being built into the bank, and heavily laden at the shore end. Another set of beams is made, in like manner, to project beyond these, and others again till the space left in mid-stream can be crossed by single timbers. It is, in fact, like the overlapping stone construction. On cart roads, where something more is wanted, there are no masonry bridges in large single spans by native builders, such as have now been built in British times. It may be of interest to mention that a few years ago, two brick bridges, each of a single arch, 140ft. span, were built (by Lieut.-Colonel James Browne, R.E.) over two of the rivers of the Kangra district in the Punjab, on the main line of cart-road along that beautiful valley.

In the choice of their materials, we see much to admire in the works of the native builders who have gone before us in India. In the most lively times of Mughal building energy, the free outlay on grand works brought costly stone from long distances, and well has their white marble and red sandstone been turned to account. The most ordinary building materials, being such as the earth supplies, have been the same in all ages. The difference in their use, at different times and places, consists in the choice that is made of the better or the worse, and in the means available, in money or appliances, for conveying what was selected to the place where it was to be used.

When we speak of power to convey what was selected to the place where it was to be used, we observe that in India this power is not often illustrated, as in some other countries, by great buildings constructed of enormous stones. This does not seem to have been one of the favourite ambitions of the builders whose work is now to be found in India. There are, of course, big stones in some buildings, but their bigness is on a different scale from that adopted in other lands, and is not such as to give rise to the admiration which we feel in seeing what has been done elsewhere. There is a big trough at Vizianagar, in Southern India, cut out of a single stone between 30 and 40 feet in length, but it is probable that it has never been moved from the place where it was made. There is a temple in Kashmir which is built of five stones, one for each of the four corner piers, with its portion of roof, and the fifth a square pointed piece, which crowns it. But the whole building is not a quarter of the size of one of the big stones in the terrace wall of the temple at Baalbek.

The masonry of the outer inclosure walls and basements of certain Buddhist works in North-Western India, perhaps the oldest masonry now standing in that part of the country, is of a peculiar kind of effective roughness. It is without mortar. The large stones are unsquared. They have a tolerably flat face, but there has been no endeavour to make them fit each other. Between the stones are irregular gaps of varying width, which are filled in with pieces of slaty rock, all laid flat, and firmly driven home into these wide joints. There are many specimens of this kind of work in the Buddhist tract of the Punjab frontier districts.

There are likewise in India stone circles of upright blocks, like those well known in England and other countries. In one of these circles near the village of Asota, in Yusufzai, north-east of Peshawar, about 50ft. in diameter, the stones have been roughly hewn on two sides. Their greatest thickness is about 2ft., and the greatest height of any now standing is between 11ft. and 12ft.

It is remarkable how little (speaking generally) even the oldest buildings in India have suffered from exposure; and this exposure is sometimes of a very trying kind. The buildings bear testimony to the good choice that has been made of the stones used in them. A dark and hard blue limestone has been a favourite material with the Hindus. It receives fine sculpture, and retains sharp, well-defined edges. Much of the Buddhist sculptured work in the north-west of India, where sculpture is very abundant, is on hard clay-slate. The sculpture on these buildings is mostly on the interior faces. The Jain temples at Dilwara, on Mount Abú, profusely and beautifully carved inside, are of white marble. Outside, these buildings are of studied plainness, not as the Hindu buildings, great and small, in all parts of India, which carry much ornamentation outside; the largest of these—the magnificent temples of Tanjore, Trichinopoli, Tinnevelly, Madura, and other places in the south, of Nassik in the west, and of Orissa in the east—being covered throughout with elaborate carved ornament and sculpture. On the hills of the Salt Range in the Punjab (hills containing the great mines of rock-salt) are Hindu temples of a grey limestone, naturally of

a somewhat honeycombed texture, which has suffered further from the weather.

In the great imperal cities of the Mughals white marble and red sandstone have been largely used together, and with excellent effect. The marble is polished, and well withstands the weather. But though it suffers little from the weather, there is another kind of injury, very subtle and troublesome, to which it is exposed. However carefully and closely the stones have been laid, yet, into the joints between them, on domes and terrace roofs, on cornices and parapets, the seeds of shrubs and trees will find their way, and there begin to grow and thrust their roots beneath. The pípal tree is particularly insidious in this kind of attack on unwatched stone-work, and if allowed to stay, as we see it has been sometimes, it will slowly, but strongly, dislodge the stones, and, if there is water near the foot of the building, will push its long roots through the wall, and down towards the moisture that it seeks.

In the Muhammadan buildings of Akbar's and later reigns—the seventeenth century and the later half of the sixteenth—the red sandstone is very largely used. There are buildings of earlier date, now six and seven centuries old, in which this stone, frequently bearing Arabic inscriptions in raised letters, is still sharp-edged and fresh. It contrasts very favourably in this respect with many buildings in England sadly defaced by weathering of the sandstone. Oxford, perhaps, looks more venerable where the edges of the stone are worn and rounded, and the form of the moulding lost; but it would have been better if this had not happened. There are buildings in this country of a sandstone much resembling in colour and general appearance that of the Mughal works in Northern India, but very different in durability. The exposed masonry of the Church of St. Michael, at Coventry, is seriously worn away, and seems to be crumbling continuously now. In past days, endeavour has been made to hold together with iron straps parts that were in danger of separating, and in some of these places little more than the iron strap now remains.

In the Indian buildings in which both white marble and red sandstone are used, the contrast of colour is sometimes given by the use of the different materials for different parts of the building, sometimes by using them together, in alternate bands, or otherwise combined. Colour is likewise shown in the Muhammadan buildings by inlaid work in the piers of the arcades, the spandrels of the arches, and other parts, and by lines of black marble inlaid in the white. The inlaid work is executed on a large scale in some buildings. The stones chiefly used are bloodstone, carnelian, and agates. The inlaid work, besides that on the borders of panels and elsewhere in geometric figures, is chiefly representations of flowers in conventional style, and often with much freedom from the rigid symmetry which prevails in most Oriental designs. Inscriptions in the Persian or Arabic characters are either inlaid or carved in raised letters, not engraved like our inscriptions. In the interior of the great reception-halls of imperial buildings, and the more ornate private apartments, gilding also was much used. But some of the most beautiful of these Muhammadan buildings are those in which there is least colour or applied decoration of any kind, so elegant are the forms and so just the proportions of the several parts, so refined the mouldings, and so true the execution. One other kind of ornamental work of much beauty is especially to be observed in these buildings, the stone screen-work of open tracery—large thin slabs of marble or sandstone, pierced with geometric figures of great variety. Very good specimens of this kind of work are to be seen in the Indian section of the South Kensington Museum.

The comparatively small variety of colour thinly applied on the outside of the Táj Mahal at Agra—the Indian building perhaps best known in England—is the cause of its having frequently been felt, at first sight, to be heavy, It is not really unrelieved by variety. Besides some inlaid coloured work, it has straight lines of black marble inlaid, black zig-zag lines on the thin engaged pillars at the corners, inlaid ornament following the outline of the parapets, and encircling the neck of the dome, and inlaid inscriptions in large letters. But so immense is the mass of white marble, that the relief thus afforded is comparatively small. A little study of the building reconciles the spectator to this massiveness, and only leaves him full of wonder and delight with the beauty as well as grandeur of the building. Its surroundings are on a scale of corresponding magnificence. The great square inclosure, with its splendid gateway, and the minarets at the corners; the straight-lined garden and its broad masonry channels, with shallow stream of water and rows of fountains in the middle; the sombre lines of tall dark cypresses, with trees of more varied foliage and colour throughout the garden;—it is with these things about it, and a sense of great stillness and solemnity over the whole, that we look at this magnificent marble tomb. And we feel how large a measure of respect and gratitude is due to the men who did all this, to those who purposed and devised a monument on this scale of grandeur, and those who executed it in a manner worthy of the conception. Have not we reason to be glad that the wealth of building-power in those days threw itself into forts and palaces, mosques and tombs, pleasure-gardens for princes, and serais for travellers? What should we not have lost if Shah Jahán, for instance, had been a prince of smaller and more modest aims, and had bestowed the best efforts of his architects on jails and court-houses, town-halls and barracks, hospitals and schools? Their time has come. But it is better for art that Shah Jahán had his turn at something else. The world has gained.

If defect of colour enhances the noble massiveness of the *Táj*, we feel this to be in agreement with the nature and purpose of the building. The use of colour on Mughal buildings was well understood and very general. In the beautiful and wonderful city at the head of the Adriatic, which so many travellers to and from India have nowadays an opportunity of seeing, we find a large amount of colouring of buildings, most of it very Oriental in character. But India has nothing to show of exactly the same kind. Buildings of brick, in India, if not faced with stone, were thickly plastered, and the colouring was given by figured designs, not whole surfaces of colour, or by a facing of glazed work, which is of two kinds, on pottery and on plaster.

The use of glazed tiles and glazed plaster seems in India to be most frequent in the western frontier provinces of Sind and the Punjab. But there are many good specimens at Gwalior, Delhi, and elsewhere, of buildings thus coloured. The work goes by the general name of *Káshí*. Glazed tiles are used when a large surface is to be uniformly coloured. Patterns also of different colours are given on single tiles. The glazing on plaster is used for coloured devices, made up of separate small pieces, of the different colours, and these are laid on and cemented on the surface of the building. The plaster, which is made of lime and sand, receives first a very thin coating of glass containing lead, which both gives a fair smooth surface for the coloured glazing that is to be afterwards applied, and enables it to adhere. Both these arts seem to have been imported from Persia. The earliest specimens of glazed-tile work known are at Mashad and Tabríz. The name Green Dome (*Sabz Gumbaz*) which is given to a conspicuous building at Mashhad, of which the city is proud, is also borne by a tomb at Lahore, of which the green covering of the dome is in good preservation. Another at Lahore is similarly called Blue Dome (*Lila Gumbaz*). The cities of Multan in the Punjab, and Tatta, and Hyderabad in Sind, and others, have good specimens of this kind of work, as well as of the plaster *Káshí* work used for wall decorations and inscriptions. Lahore has many of great excellence and beauty; the most complete is the mosque of Wazir Khan, in the heart of the city. The figured tile work is now carried on in Sind, at Tatta, on the Indus, and at Hala, 30 miles north of Hyderabad. The Masjid, built by Shah Jahán, at Tatta, has had the deficient tile work lately restored. At this place there is no glazed work of the other kind—that is, on inlaid pieces of plaster.

Indian brickwork, except in wells, is rarely seen, for it is always covered, or meant to be covered in one of these ways. Its quality is excellent, though its appearance is coarse, as it was not meant to be seen. Well-burnt bricks are united by well-made but rough mortar, the mortar courses being of great thickness, often much thicker than the bricks, giving the work the appearance almost of a concrete wall with thin bands of red brick. It is indeed a concrete. A similar material is used for terraced floors and roofs. And there are cases where, the wood and tiles on which it was laid having decayed and fallen away, the terrace covering has remained, spanning the gap, as a single block of artificial stone or concrete bridge.

In stone buildings in various parts of the hill countries of India, the insertion of horizontal beams at intervals in the masonry, which is a common constructive arrangement, gives a pleasing variety to the outer face of the work, like the use of stone of different colours. The practice is similar to the use of bonding courses of red brickwork, which we see in Roman walls of stone masonry in Britain. This was well shown in the old wall lately discovered in extending the railway buildings in the neighbourhood of Fenchurch-street Station. The bright red bands were of tiles or bricks of large size, of which there were three courses in each horizontal band. Similar bonding brickwork of bright colour is to be seen in a massive Roman wall at Leicester; of which English builders have taken advantage in a very practical way, by using part of the materials, both brick and stone, for the adjoining church of St. Nicholas. In the church the construction is repeated, stone masonry with courses of brick at intervals. The cathedral of Carlisle has in like manner helped itself to stone from a neighbouring Roman wall.

In these cases, as in many others, perhaps no great harm was done, as the walls were plain and uniform masses of solid masonry, interesting chiefly on account of their history and their construction, and having plenty of the work still left to satisfy this interest. But the practice is a dangerous one. It has been often followed, in all countries, and has sometimes not been quite so harmless. We cannot tell now what we have lost at old Delhi. Bernier says, Shah Jahán's new city, which was being built when he was there, was conveniently near the old one, which supplied quantities of building material ready for use. Very likely the honest intention in the first place was to take only the stones from absolute ruins. But we know how difficult it is to get any rule of this kind rigidly adhered to, and to prevent the despoiling of buildings which, if in a sense ruins, are yet ruins to be carefully and tenderly preserved.

ST. PAUL'S ECCLESIOLOGICAL SOCIETY.

THE first of a series of fortnightly visits to churches in London and its vicinity, arranged for by the council of this society, took place on Saturday afternoon, and was largely attended. *St. Mary Magdalene's, Munster-square*, designed by the late Mr. Richard C. Carpenter, was the first church seen. Here they were received by the vicar, the Rev. F. J. Ponsonby, who read a short paper sent by Mr. R. Herbert Carpenter, who was unable to attend the meeting. The writer explained that the principle aimed at in the church was spaciousness. The ancient City church of Austin Friars was taken as an example, and worked out with necessary modifications. The wide aisles and lofty arcades, with the absence of a clerestory, were like Austin Friars, while the high-pitched roofs of St. Mary Magdalene were, the author considered, improvements on the flat-aisle roofs of the older church. This type made the arcade its chief feature, in contradistinction to the modern type, with a nave of wide span, and narrow passage-aisles where the arcade became insignificant—a form of building difficult both for hearing and heating. The style of St. Mary Magdalene was well-developed Decorated. The traceries of the windows were based on geometrical forms. The mouldings were very carefully proportioned to the larger and smaller mullions and tracery. The rich arcading round the chancel followed in its detail some of the ancient work at Exeter Cathedral—one of the finest examples of this Geometrical Decorated date. The roofs of nave and aisle were adaptations of ancient roof at Sherborne, which the late Mr. Carpenter was restoring about the time he designed the church. The east window of chancel was a splendid example of Welby Pugin's powers of design; it was executed by Hardman. The south windows of chancel and the east windows of nave were not very good. The two west windows were by Clayton and Bell, and were fine examples of their work, and the three south windows were by Heaton, Butler,

and Bayne. The chancel arcading was originally decorated by Crace, under the late Mr. Carpenter's direction; the present paintings formed a fine series of figures, and were by Mr. Daniel Bell, a member of the choir. The space above the altar was originally all gold with a diaper upon it, and, in the writer's opinion, was better in effect than the present decoration. Mr. Bell had also painted the wooden ceiling of chancel. The iron screen in chancel arch was no part of the architect's design, which was for a stone septum wall, and although the author was partly responsible for the present screen, he should like to see it removed, as it was quite unworthy of the church. Speaking generally, he considered there was no straining after an effect, but the result was quiet and simple, and especially pleasing, from the beautiful proportions and careful details. The chancel was dignified and ample in size, while the body of the church was admirably adapted for a large congregation to see and hear. The Vicar added his testimony to similar effect, remarking that although the church was founded in 1849, and completed in 1850-51, yet it would bear comparison with many more recent buildings. At present it consisted only of spacious nave, 79½ft. by 26ft., south aisle, 21ft. 6in. wide, extending nearly to east end as a sacristy, and chancel 32½ft. by 23¼ft. wide; but the houses and ground had been acquired to the north for building a second aisle, on the same lines as that on the south. The plans had been prepared by Messrs. Herbert Carpenter and B. Ingelow, and would be carried out next year. The scheme would ultimately be completed by the erection at the S.W. angle of site of a tower nearly 100ft. high, finished with broach spire, having three ranges for spire lights, and rising another 70ft. Facing the font in the south aisle was an early painting by Mr. H. S. Marks, A.R.A., in 14th-century style enriched with gilding, and representing "Christ Blessing Little Children."

At *St. Andrew's, Wells-street*, the members were welcomed by the Rev. Benjamin Webb, M.A., F.S.A., who described the church, remarking that it was the first of those erected under the Peel Act, and was commenced in 1845 and consecrated two years later. It was designed by Mr. Dawkes, who died only a short time since, and cost about £10,000 for erection. It was built by Myers, the bricklayer employed by Pugin for his principal works, and time had proved it to be thoroughly and soundly put together; no settlements had shown, it was very difficult to open out new windows, and the tower had proved amply strong enough to hear a good peal of eight bells. The building was planned to suit a nearly square site, and, with the galleries, seated 1,200 people. The style was Perpendicular, as understood 35 years since; but the church, when he became incumbent, was very defective; it was excessively dark, the galleries and roof were painted of the dingy chocolate tone then fashionable, and which had faded into a dingy brown; there was no ventilation of any sort, the warming-apparatus would not work, and the gas-jets were hung so as to come between the congregation and preacher. Most of these defects had been remedied, but they could not prolong the fabric either to east or west, and the galleries had been retained. It now contained specimens of the work of all the chief older architects of the Gothic Revival, except Sir Gilbert Scott. When the speaker was a curate in Staffordshire, in an alabaster district which had already produced Chantrey, he heard of an uncultivated lad named Redfearn, who amused himself by modelling in the round in alabaster from pictures in the *Illustrated London News*, although he had never seen any carving. Finding the youth seemed to have genius, he spoke to Mr. Beresford Hope, who had him educated, and sent him as a pupil to Clayton and Bell. As they knew, he was cut off in a melancholy manner in his prime, his death, according to his statement to the speaker, being accelerated by the rejection of the statues of the Latin Doctors on theological grounds at Bristol Cathedral, but had Redfearn lived, he believed he would have become the greatest Christian sculptor of his age. He carried out the reredos in that church, from the designs of Mr. G. E. Street, R.A. It was executed in alabaster, and was a rich specimen of tabernacle work, enriched with figures. Mr. G. F. Bodley wished to see it treated with colour and gilding; but as he had never seen work of the kind which did not appear tawdry the speaker proposed to leave that work to his successor. The open-work hammered-iron pulpit was designed by Mr. Street on some Spanish examples, and was admirably fitted by its lightness and economy of space for a town church; the chancel screen was also of hammered iron from the same architect's design, and was also executed by Hardman. The original font was by Pugin, but had been so injured by washes of colour and by chipping that a new one of rosso-antico, designed by Mr. Street, had been substituted, and was about to be inclosed in a groined baptistery to be enriched with frescoes by Clayton and Bell. The gallery front had been treated after the style of 15th-century screens in Norfolk with figures of saints, forming a complete scheme of adoration. They commenced with the Annunciation in centre of front of west gallery, and were continued through the succeeding centuries upon the sides, and upon the organ balcony; the treatment of the Saviour's figure upon this front was felt however by the artists, Messrs. Clayton and Bell, to be inadequate. The east window was an example of Pugin's advanced Perpendicular, from whose designs it was filled with stained glass by Hardman. It owed its success to the introduction of a little line of white round the figures, and also partly to the changes effected by Pugin in the design while the work was in progress. There were also windows in the church by Warrington, by Lavers, Barraud, and Westlake, and by Clayton and Bell. From the designs of the lamented Mr. W. Burges, A.R.A., they had several works, all characterised by the personal modelling of details and supervison during execution for which he was remarkable; they included an altar-tomb to a former incumbent, a litany-desk, a large chalice covered with symbolic designs, &c. There were an eagle lectern designed by Butterfield, and executed by Potter, frontals by Seddon, and examples of the work of Carpenter and Slater, of Bodley and Garner, and several other architects.

INTERIOR DECORATION IN GROSVENOR-SQUARE.

WE have seen the interior decoration of a house in Grosvenor-square, which, from the taste displayed in its conception and the manner in which it has been carried out, deserves notice. The house in question is Mrs. Gerard Leigh's residence in Grosvenor-square, a mansion erected, we believe, from the designs of the Adams Brothers, adorned externally by Corinthian columns standing on a rusticated basement. The design and execution of the decorations have been entrusted to Mr. Frederick Arthur, of 18, Motcomb-street, Belgrave-square, S.W., who appears to have displayed the utmost moderation and taste, and to have avoided anything approaching the *outré* in design or the garish in colour. Much of the old Adams's decoration remains, but in some cases it had given place to more recent and questionable work, and Mr. Arthur has remodelled these portions of the decorations. The hall is a spacious apartment, with its walls panelled and hung with old tapestries of figure and historical subjects, upon a bronze-coloured ground. At the further end from the entrance-door is a massively designed oaken-looking fireplace of Italian design, with richly carved pilasters and arabesques, panel figure-subjects, surmounted by a deep coved cornice, the latter being enriched by stamped bronze leather of rich design. Passing through this to the inner hall, we enter by a door on the right to the morning-room or "bronze-room," as it is called, a finely proportioned apartment decorated in all the lustre-like richness and tone of bronze. The dado and architraves of doorways are of a bronze red tint, but the walls, frieze, and cornice are of a fine metallic bronze colour. This effect is obtained by a canvas specially prepared by Mr. Arthur, and lacquered; the surface is enriched by embossed ornamentation of a neat conventional Italian pattern. The cornice and frieze may be mistaken for hammered metal-work, they are so metallic-looking; but the eye is immediately drawn to the ceiling of the room, the decoration of which is highly pleasing and harmonious in its colours. The artist here has not entirely confined himself to the Italian or Renaissance, but has allowed his fancy to indulge in Holbeinesque freedom in the details of the ornamentation.

The ceiling has been remodelled, and the general arrangement consists of a large central rectangular panel surrounded by enriched scroll borders, and smaller medallions and panels of painted and emblematic figure-subjects. There is nothing meretricious or garish in the decoration, while the colours and tints in light shades of verdigris-like hues are relieved and heightened by gold and by arabesques and scrolls. The centre oblong panel has a life-size figure-subject of Endymion. The manner in which the subject is handled is very successful; we find the colouring in a rich brown, but rather low, key, made to harmonise with the prevailing bronze tone of the room. Around this subject is a wide scrollwork margin, the smaller panels being disposed between bands of guilloche enrichments. These are filled with subjects taken from the signs of the Zodiac, and other allegorical compositions representing the four quarters of the globe, &c. Mr. Paget was the artist of these. The manner in which the draperies or curtains have been managed calls for notice, the valances being made to assume the Italian scrolled form at the top.

The staircase is a very handsome feature, the walls of the square having been relieved by panels for old oil-paintings in a pleasing manner. The tint of the wall is of a delicate shade of bluish or greyish green, and forms a good framework to the pictures, which are surrounded by reeded members. The staircase is surmounted by a circular gallery, and is lighted by a lantern at the top, and the pendentives and bas-relief of the Adams's plasterwork have been treated quietly and artistically. The staircase in connection with the apartments which open from the landing lent itself admirably to the decorative artist, and Mr. Arthur has enhanced the value of this connection by his decorations. From the landing a large doorway opens into the "music-room," a circular-domed apartment, lighted above, and adorned with four circular niches in the walls. The dome, enriched by octagon panels, has been treated with solid gold and white, while the semi-domes of the niches are treated with gold and white or cream tints in a lighter manner. On one side of this square vestibule, as we may call it, we enter a small room decorated in scarlet, and called the "red room." The treatment here mainly consists of wall-panels, covered with rich damask silk of a bold pattern, surrounded by gilded mouldings; and a rearrangement of the doorway, having a panel with the Holy Family by Rubens above it, and a general relief of the ceiling ornamentation by gilding. Adjoining this room is the boudoir, the contrast in the colouring of which is very marked. The walls here are hung with a particularly quiet and unobtrusive brocaded silk in a mignonette shade of green, relieved by a handsome and bold pattern, and the chimneypiece with its over-mantel are left white, while the coved ceiling is very simply and quietly relieved. The ball-room, on the other side of the domed music-room, is a long and spacious apartment fronting the square, and of the whole frontage in length. Here the prevailing scheme of decoration has been to carry out the chastened and delicate style of the Adams's ornamentation. The doorways are surrounded by enriched pilasters carrying entablature and pediments which are painted of a dead white, while the inner architraves, moulded and highly-enriched with members, are treated in solid gold, and contribute much to the effect without looking at all flashy. The walls are panelled, the panels having a rich-patterned brocade velvet of a delicate canary tint, set off by mouldings of cream colour, picked out in gold. The ceiling is a very fine example of this style of decoration, the centre is adorned by an oval with the characteristic radiating scalloped work, and the ends have wide bands of ornament painted in several shades of cream, and white and gilded. A frieze of delicate scroll and festoon in the same style, picked out in tints and gilding, surrounds the room, and there is a handsome statuary marble chimney-piece.

The dining-room is less elaborate in its treatment, and here the chief effort, for obvious reasons, has been confined to the ceiling, which is decorated in a very agreeable and unobtrusive manner. The ornamentation, as in the other rooms, is in carton-pierre, and in these have been introduced some very cleverly-painted medallions

and panels in monochrome by Mr. Cuthbert, of Cheyne-walk. In the centre the panel represents the Judgment of Paris, while the smaller ones round the ceiling are emblematic figures typifying the seasons and the hours of the day. This ceiling is one of the best we have seen as an example of revived Adams decoration. The moulding and plaster work have been executed by Messrs. Graham and Sons, of Rathbone-place.

THE ROYAL ACADEMY AND ART EDUCATION.

IN responding to the toast of "The Royal Academy" on Saturday evening last, Sir Frederick Leighton took occasion to explain the important modifications which have lately been made in the Academy schools, with a view of increasing and improving the facilities offered there for art-study. So far back as 1872 a school committee was appointed, of which Sir (then Mr.) Frederick Leighton was the chairman, and, as the result of the deliberations, various tests of study were introduced in the Painting school, whilst in the Architectural school an upper school or class was established, into which those students who wished to compete for the Gold Medal or Travelling Studentship were obliged to pass before they could do so. The immediate reason for this new regulation was grounded on the disinclination of those who entered as students to continue their study in the school specially founded in 1870 for that purpose: they seemed to consider that the privileges of free entrance to the Academy Exhibition for seven years, and the acquirement of an ivory disc setting forth that fact, were sufficient. Still further modifications, however, seemed to be required, and these have just received the sanction of the Queen, and were specially referred to by Sir Frederick Leighton. Instead of being admitted for seven years as heretofore, six years will be the new limit, and unless at the end of three years the student can show that he has availed himself of the privileges offered, his studentship will cease. The student will now be required to attend with fair regularity (especially on those evenings when the visitor is present), and within the three first years of his admittance to the schools to attend the lectures and prepare certain designs and other drawings; the first provision being complied with, if the drawings submitted show that the student has made good use of his time, his studentship will be extended to the full period of six years. So far for the restrictions, and now for the rewards. The silver medals for measured drawings and for perspective remain as at present, except that the latter competition will be restricted to architects, another medal being offered in the Painting school. Two new prizes are offered, one of £10, for the best architectural design executed in the school during the first year of studentship, and £25 for the best design executed in the school during the first or second year after admission to the upper school.

The most important change, however, which has been made is in the competition for the Gold Medal and Travelling Studentship. The latter was founded in 1863, being of the value of £100, tenable for one year; subsequently, in 1875, it was increased to £130, the £30 being nominally for travelling expenses to and from England. In the Painting school the Travelling Studentship could only be competed for by Gold Medal students; it was a biennial prize, taken alternately by painters and sculptors, and was tenable for two years. In the architectural school it was an annual prize, tenable for one year, and limited to those students only who had entered the upper school. It will now be divided into two studentships, one a Foreign Travelling Studentship, tenable for one year, with an allowance of £200; the other, an English Travelling Studentship, with an allowance of £60, each offered biennially. The former will be competed for in the year known as the "Gold Medal year," and the Gold Medal will (as also in the case of painters and sculptors) be thrown in with the foreign Travelling Studentship. This raises the value of the biennial competition, and, it is hoped, will greatly increase the number of competitors. The drawings will have to be prepared in the Academy, six weeks being allowed instead of one month, as heretofore. It is considered also that the English Travelling Studentship, though of less value, will be esteemed as a great boon by those who, for various reasons, are either unable to leave England for so long a period as a year, or who prefer to study our own English architecture. The time to be spent is not specified, but a three months' tour would probably suffice to prepare those drawings which would be required. It is true that on the whole the Architectural school has not gained much in the value of the rewards offered, for with the Gold Medal, a scholarship of £25 tenable for two years, was included, which is now omitted. The concentration, however, of the Gold Medal and Travelling Studentship of £200 in one, will make it a veritable blue ribbon for the student who carries it off, and it is to be hoped at some time that some additional reward will be offered to the student placed second in the event of there being a good number of competitors. Beyond these changes, are two others of importance to architectural students: the first, admission to the Antique and Life schools under certain restrictions; and, the second, the establishment of a school for modelling on Saturday afternoons; the latter will offer great advantages. It will be remembered that, many years ago, in 1862 or 1863, a modelling class was established in connection with the Architectural Association. It fell through after a time; but with the superior advantages offered in the Royal Academy, it cannot fail to be of the greatest service to architectural students. The additional prizes offered in the Painting school are numerous and of considerable value; many of them are the results of bequests to the Academy, which have been made for that purpose, and others are deemed necessary to raise the standard of education. To the Turner Gold Medal for landscape a scholarship of £50 is added. A Creswick prize of the value of £30 also is offered for a landscape in oil. A Silver Medal is offered for a copy of a landscape in oils and for a set of 6 drawings from the life, four prizes, of £50, £25, £15, and £10 respectively, are offered. In order to encourage line engraving, a gold medal and £25 will be given for the best line engraving of a figure drawn from the life, the original drawing for which will have to be made in the school. A separate school also is to be provided for sculptors, and in addition to the Gold Medal and Travelling Studentship, now offered biennially, instead of every four years as heretofore, there will be two prizes of £30 and £10 respectively, to be competed for, for the best models of a design to be executed in the Academy in six consecutive days, and a silver medal for a design for a medal. One other reward, to which Sir Frederick Leighton specially referred, is a prize of £40, for the best design in watercolour or tempera, for the decoration of part of a public building; and should an occasion present itself for executing this design in some public building, a sum of £4 per week will be allowed to the prize-holder, so long as he is engaged in carrying it out. Such allowance not to last longer than 12 months. In calling attention to this new prize, Sir Frederick stated that it had his deepest sympathy, and that he would spare no personal effort for its efficient working: the Academy, however, did not wish to trench on the province of those public bodies or private persons through whom alone this most noble form of art could be effectually fostered. The results of this last-mentioned prize will be regarded with much interest by architects who, it is to be hoped, if an occasion should present itself, will support the efforts of the Council of the Academy by advising their clients to accept an offer to decorate more of their works if made to them. One other modification completes the series. The library of the Royal Academy will be open after 6 p.m. till 8 p.m. on Mondays and Thursdays, the lecture nights, so that students waiting in turn need not necessarily waste their time.

DOCKS.

AT a meeting of the Society of Engineers, held on Monday evening, a paper was read by Mr. John Standfield on "Floating Docks, the Depositing Dock, and the Double Power Dock."

The depositing dock is L shaped, that is, it has only one side. While it is being raised or lowered, it is kept horizontal by the outrigger, which is a broad shallow pontoon attached to the side of the dock and so ballasted that it always floats at about half its depth. The bottom of the dock consists of a series of parallel fingers or pontoons rigidly connected to the side of the dock, but quite free at the outer ends. The special feature of this dock is that it can deposit vessels on staging formed of parallel rows of piles capped by horizontal timbers. These rows are erected at right angles to the shore line. Vessels of any breadth can be raised and deposited. One dock can serve any number of vessels, as the number that can be accommodated is limited only by the length of staging provided.

In 1876, Messrs. Clark and Standfield contructed a 6,000 ton depositing dock for the Russian Government, and they have recently contracted for one of these docks for Barrow.

The double power dock differs from an ordinary floating dock, inasmuch as it utilises the buoyancy of its sides as well as that of the bottom, and it has the unique advantage of being able to dock itself in two hours. The sides are enabled to slide up and down between fixed corners, and by securing them in their low position and pumping them out, their lifting power is added to that of the pontoon. This dock is very rapid in its action, having less useless weight to lift than any other form of dock. It has about twice the lifting power of an ordinary floating dock for its size and weight, and its cost is therefore much less. Its money-earnings powers are surpassed only by the depositing dock above mentioned. Neither the depositing dock nor the double power dock can sink even if all its valves be intentionally left open.

AMALGAMATED SOCIETY OF CARPENTERS AND JOINERS.

THE 21st Annual Report of this Society for the year ending December 31st, 1880, has just been issued as a bulky volume of 270 pages. In it Mr. J. D. Prior, who was recently appointed Inspector of Factories for the Birmingham District, offers a valedictory address on retirement from the post of General Secretary, after nearly ten years' service in that capacity. In this address Mr. Prior remarks that during his period of office the Society has been increased by 112 branches and 8,000 members, while the augmentation of capital amounts to £24,557 1s. 2¼d. while £246,582 had been paid in benefits to members. He earnestly urges the members to renew their efforts to extend the influence of the Society, and to increase its number of members. As to the past year, he says the statistics which have been compiled prove that the long-continued depression in the building trade is slowly but surely passing away. During 1880, 18 branches were opened and six closed, while the net gain of members was 730, making a total roll of 17,764 members. The income during 1880 amounted to £42,173 8s. 1d., being £2,318 10s. 8d. more than the receipts in 1879; the expenditure was £49,566 2s. 3d., £12,879 19s. 1d. less than the disbursements during the preceding year. The excess of expenditure over income has reduced the cash balance to £41,386 9s. 3½d., being a loss of £7,392 14s. 2d.; but even this, compared with the deficiency of the previous year, £22,591 3s. 11d., shows that the times are improving. The present value of the buildings and other property belonging to the Society is £46,395 5s. 8½d., or £2 12s. 2⅝d. per member. In unemployed benefit, £21,922 was expended, or £1 4s. 8d. per member, 8s. 1d. per head less than the same benefit cost during the preceding year. The cost of tool benefit was greater than was ever previously experienced, being £1,412, or 1s. 7d. per member. Sick benefit cost £11,731; accident benefit, £1,200; superannuation benefit, £487; funeral benefit, £1,924; benevolent grants, £697; and grants to other trades, £39.. £2,522, or 2s. 10d. per member was spent in trade privileges, including strike pay, arbitration and conciliation expenses, law expenses, and all other costs in connection with trade questions; the expenditure under that heading in 1879 being £10,558.

At the quarterly meeting of the Worcester Diocesan Church Extension, held on the 21st ult., the following grants were made:—Crowle Church restoration, £150; Broadwas Church restoration, £100; and Kington Church restoration (additional) £18.

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ILLUSTRATIONS.

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OUR LITHOGRAPHIC ILLUSTRATIONS.

ROMAN CATHOLIC CHURCH, SCHOOL AND PRESBYTERY AT BROMLEY, KENT.

We give this week a fac-simile of Mr. Ingress Bell's drawing, now being exhibited at the Royal Academy, showing the plan and main elevation of the church, school and presbytery proposed to be built from his designs at Bromley, in Kent, by the Right Rev. Monsignor Goddard, to meet the wants of the Roman Catholic population, who are increasing proportionately with this fast-growing town, and who have now no nearer place of worship than the Catholic church at Chislehurst. The site selected is on the main London road, on the outskirts of the town, and immediately opposite the very interesting "Bromley College," built by the Bishop of Rochester in 1666. This picturesque group of buildings, with its pretty chapel, its quiet quadrangles, and shady walks—still paced daily by those "widows of clergymen of the Church of England" for whom the good bishop endowed the work—is doubtless familiar to most of our readers. The proposed church will stand some two or three feet above the level of the road—an accident which will give additional effect to its lofty proportions. The materials will be red brick, with stone dressings, and green "Countess" slates for the roofs. The whole will be treated with the severest simplicity of detail—the interior will be lined with pressed bricks, and thick walls and well-studied proportions will alone be relied upon for effect. A rood-beam and figures will mark the division between nave and sanctuary. The school and priest's house will be first commenced, the former being used as a temporary chapel during the progress of the church.

TYNECASTLE TAPESTRY.

In our issue of the 2nd April, we gave an illustration of a new wall-covering material, Tynecastle tapestry, so called by the inventor, Mr. W. Scott Morton, of Edinburgh, and to-day we again give four of his designs for the same article. This tapestry, which is of embossed flax, is so modelled as to retain the canvas texture, while receiving a great variety of decorative treatment, and is being freely used by decorators for the interior embellishment of walls, dados, friezes, panels, ceilings, screens, &c., of public halls, banks, offices, ship saloons, and in rooms of houses where the most artistic effects are desired. In the hands of skilful workmen there is no limit to the uses and treatments to which this tapestry may be adapted. In the case of large drawing-rooms the canvas has been gilt over in such a way as to preserve the texture, and has been toned down so as to give a soft effect. In other cases, after gilding the background has been picked in with colour. In a large public building where it is being used, the whole, after being coated with a ground-work of soft yellow, is being scummelled with grey green, and parts picked out with soft gold. One very simple and satisfactory treatment for walls intended to receive pictures is the painting of the canvas with a coat of fine light colour after sizing, and afterwards receiving a scummel or glaze, which is partially wiped off, and a rub with a wax brush, or a coat of mastic varnish, when thoroughly dried, takes off the shiny effect.

TOWER OF ST. JOHN'S CHURCH, CHESTER.

One of our single-page illustrations to-day shows a view of the now ruined tower of St. John's Church, Chester, which recently fell, at the same time entirely destroying the Early English porch at its base, and which is seen in our view. The tower itself, though perhaps not the most perfect example of its kind, was by no means so indifferent a specimen of English architecture as to be unworthy of every care on the part of the custodians of the church, who, instead of making the already dangerous structure secure, seem simply to have left it uncared for, and hence the fall of the tower, which has now taken place. This Church of St. John was originally the cathedral church, and was to have had not only two western towers, of which the one now referred to was one; but it was planned with a central one also. The style was Late Norman for the body of the church, advancing into the Transitional in the upper portions of the work. The south-western tower and western bay did not apparently get much beyond the ground-level, while in the time of Henry VII. the old walls of the completed tower were cased with ashlar, and the Perpendiculary belfry stage and upper part were added. It was no doubt chiefly due to this want of solid building and good construction that the present ruin is to be attributed. Mr. John Douglas, architect, of Chester, reported on the state of the building some ten years ago, and at that time made careful measured drawings of the entire structure, which was greatly in need of repair, while the tower has evidently been in a dangerous condition for several years. Mr. Douglas's drawings will now be of the utmost service in restoring the church. Mr. S. Cooper Scott, writing to the *Chester Chronicle*, states that in January last, after the fall of some stones from the south-west buttress, Mr. J. L. Pearson, R.A., was called in, and he, after visiting the church and taking measurements, sent in a report to the committee on April 7th. He stated his opinion that the core of the work was yielding, but as a temporary measure recommended that the loose stones be removed from the tower or set in cement, and this work was undertaken by Mr. Hughes, of Alford, who had examined the tower in 1871. The masons reported that the work of repair was almost impossible, having noticed the widening of cracks in the north-east buttress, and, as is now well known, this portion of the tower fell on Thursday night, the 14th ult. By reference (Brit. Museum, Harl. 2,073) we learn the following particulars relating to this tower, and the notes which we give are attached to a ground plan of the church, dated 1589:—"K, the steeple, whereof the one half, or two sides, are ruinated, and is building, being already neere twelve yards, and so standeth unfinished, being a very fair steeple, about twenty-six yards high; S, the south side of the steeple, which is decayed; T, the west side of the steeple, which is decayed; V, the whole and very fair and sound side of the steeple." It is interesting to note that the side referred to by note V as sound and in such good repair, viz., the north, is the side which has now given way. Our illustration has been taken from a drawing kindly furnished by Mr. P. J. Marvin.

"BUILDING NEWS" DESIGNING CLUB.—A COTTAGE HOSPITAL.

"Jack" is again the author of the selected design, and we publish his sheet of drawings to-day, the subject of competition being a Cottage Hospital, having two wards, with accommodation for four beds in each ward. Red brick is intended for the walls, with tiles for the roof. The central gable is in rough-cast plaster work.

MASTER'S LODGE, UNIVERSITY COLLEGE, OXFORD.

This new building has been recently erected from the design of Messrs. G. F. Bodley and T. Garner, architects. It is of somewhat considerable size. "Brown's Library" was left to the College on the condition of its being placed in the master's lodge. This added to the dimensions usually necessary for such a residence. The style of the building is in harmony with the date of the College buildings. The interior is fitted with oak panelling in the hall and staircase, and in Brown's Library. The building is of stone. The view given is that of the garden-front. The drawing is being exhibited in the Royal Academy.

MR. HORSLEY, R.A., ON THE "THREE ART CRAZES."

At the opening of the new Manchester School of Art last week, Mr. Horsley, R.A., cautioned those present against any devotion to "art crazes." There were three kinds of art crazes — the Classic, the Mediæval, and the Æsthetic. The Classic craze was a very remarkable thing. There was a curious and purely heathen element among the art desires of a great portion of our people, which, when one thought about it, appeared absolutely absurd. There were men who believed the only way of resuscitating "high art," as they called it, was to go back thousands of years and do as the artists did at that time. They seemed utterly to forget the principle upon which the great men of those days acted, and which utterly confuted those troubled with the Classic craze. The great masters of antiquity never went groping thousands of years in the past for their inspiration; they never looked so far back in the past for their subjects, but they took the very incidents of the moments and the time in which they lived. They illustrated their own religion, their own history, their own poets. And when Manchester men arrived at the period when the walls of their buildings came to be decorated in the way which he had indicated, they must appeal to the public by giving to them subjects with which they would entirely sympathise. As for the Mediæval craze, that could be most fully illustrated by the church architecture of our time, which was a reproduction of the past of a most blind kind. The Gothic church was to him the most perfect emanation of human genius, being so exquisitely beautiful in itself and so admirably adapted to the purpose for which it was designed; but that which was fully adapted to the wishes of the people four or five centuries ago was utterly unadapted to our own. We had now churches in which a very large proportion of the congregation could neither see nor hear. He spoke most feelingly on that subject, for he had been literally driven out of his parish church because in the seats assigned to him he could not see and could not hear anything. The clergyman had arches on the right of him, arches on the left, arches before and arches behind him; the result was that his voice was utterly swallowed up in them, and many of the congregation did not hear a single word distinctly. He hoped to see the time when that question would be taken up, for it was a question that art schools might deal with thoroughly and effectually. Mr. Horsley observed that he had better not say anything upon the Æsthetic craze, lest he should give offence perhaps to some of the ladies present.

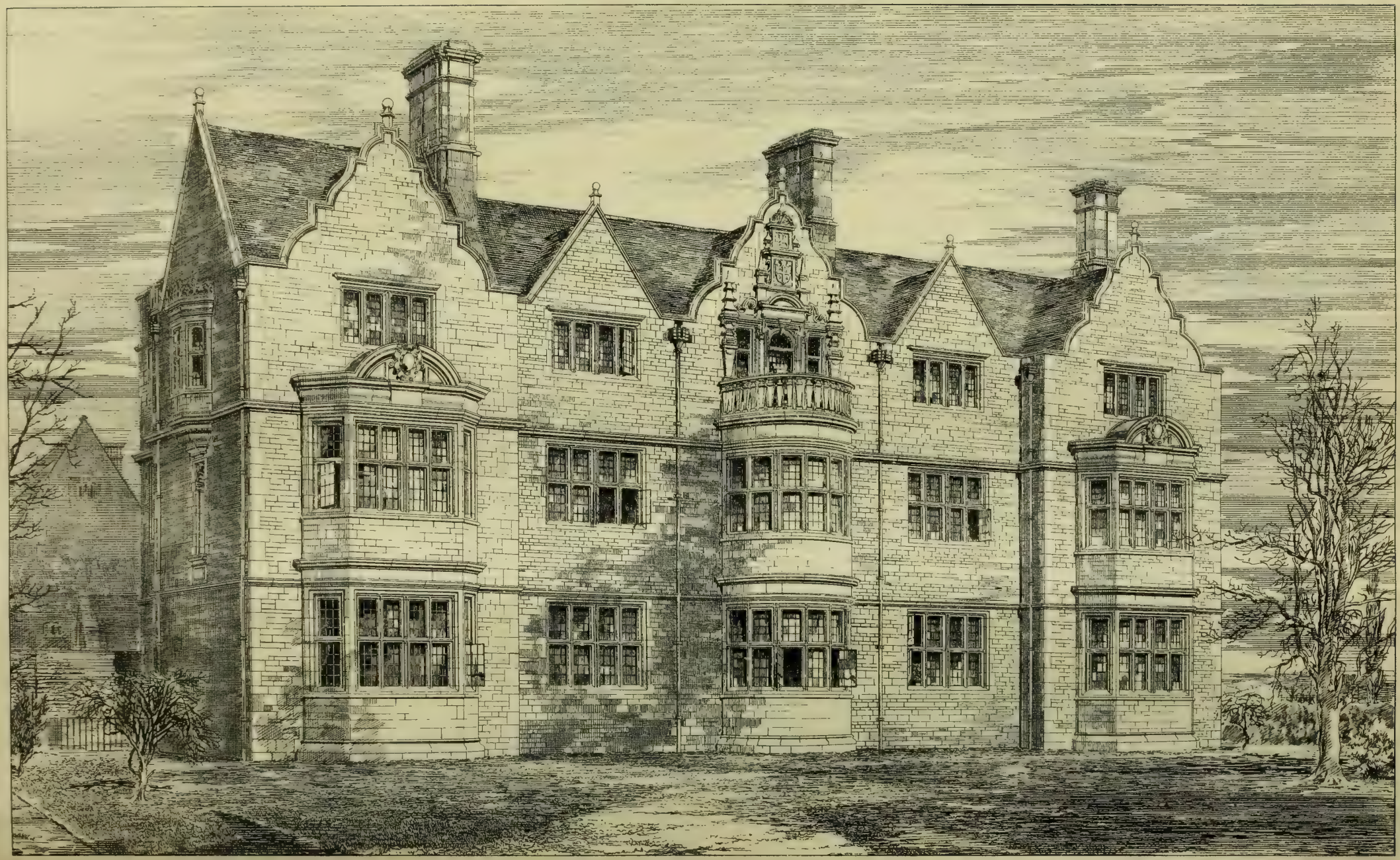
CHIPS.

A committee was last week appointed by the vestry of Skerton, near Lancaster, to take steps for the restoration of the parish-church, including reseating, and the erection of an organ-chamber.

At the last meeting of the poor-law guardians for Limerick, Mr. Henness was instructed to prepare plans for new workhouse buildings.

A meeting of the council of the Essex Archæological Society was held on Colchester Castle last week, when four new members were elected into the society, and arrangements were made for the annual meeting to be held at Chipping Ongar this summer. For the meeting of 1882 the town of Billericay was suggested as a centre. At a subsequent joint meeting of the council and the museum committee of Colchester Corporation, Mr. J. E. Price, F.S.A., was instructed to prepare a descriptive catalogue of the contents of the museum in the castle.

The drainage of the district of Caerleon has just been completed for the local board of that town. Mr. J. Warren has been the engineer, and Mr. C. Miles the contractor.



MASTER'S LODGE UNIVERSITY COLLEGE
OXFORD
Bodley and Garner, Archts.

Photo Lithographed & Printed by James Akerman, 6, Queen Square, W C

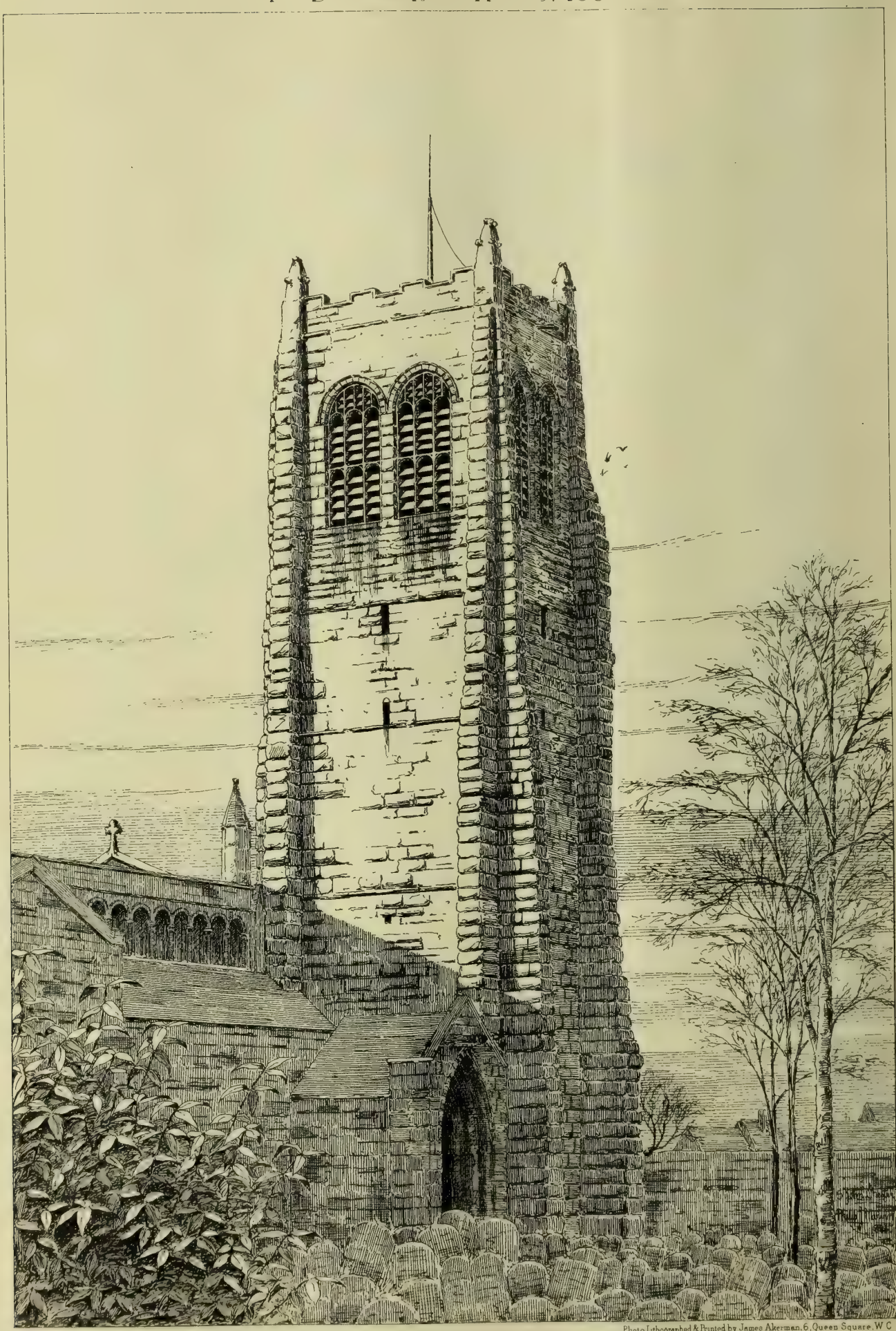
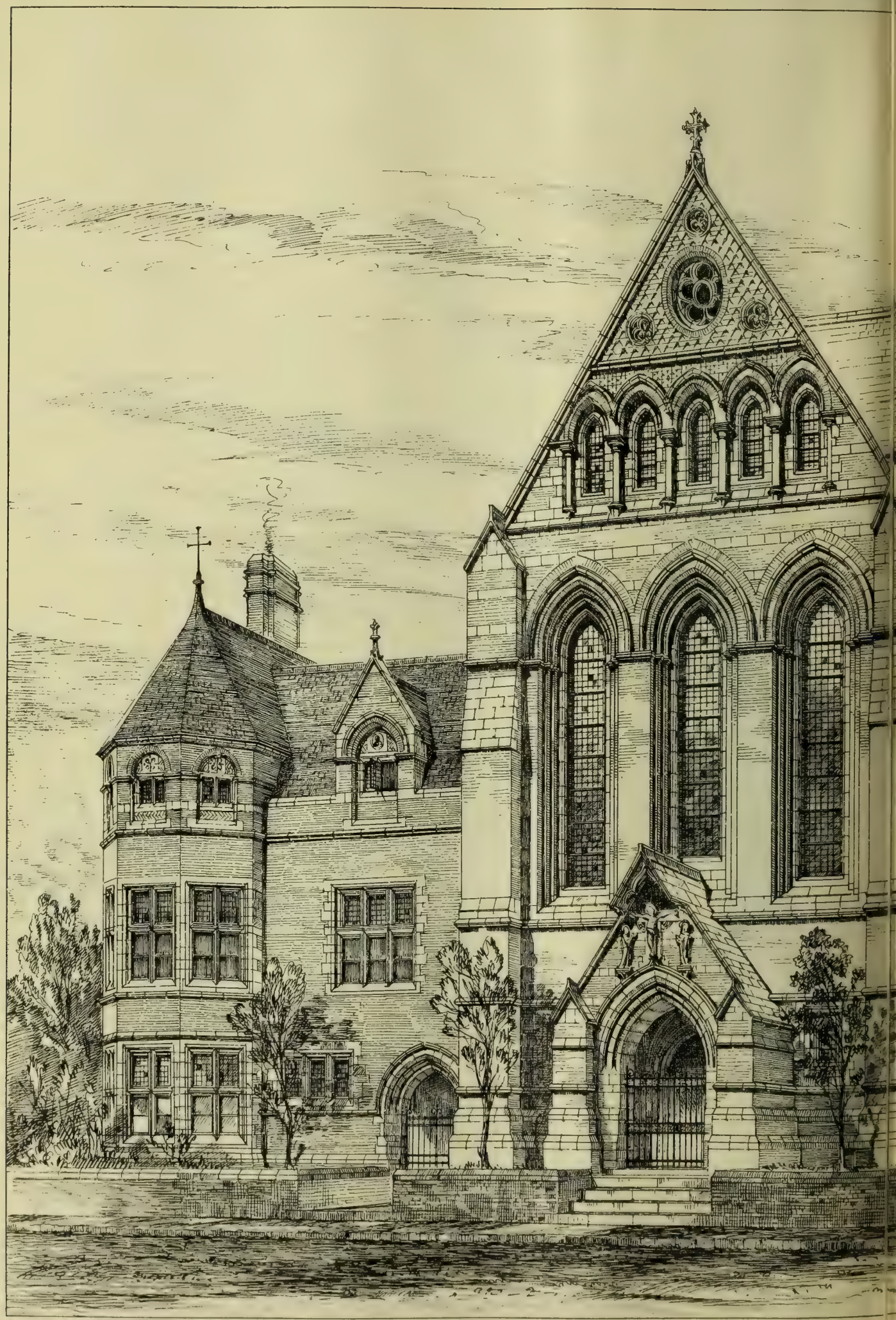
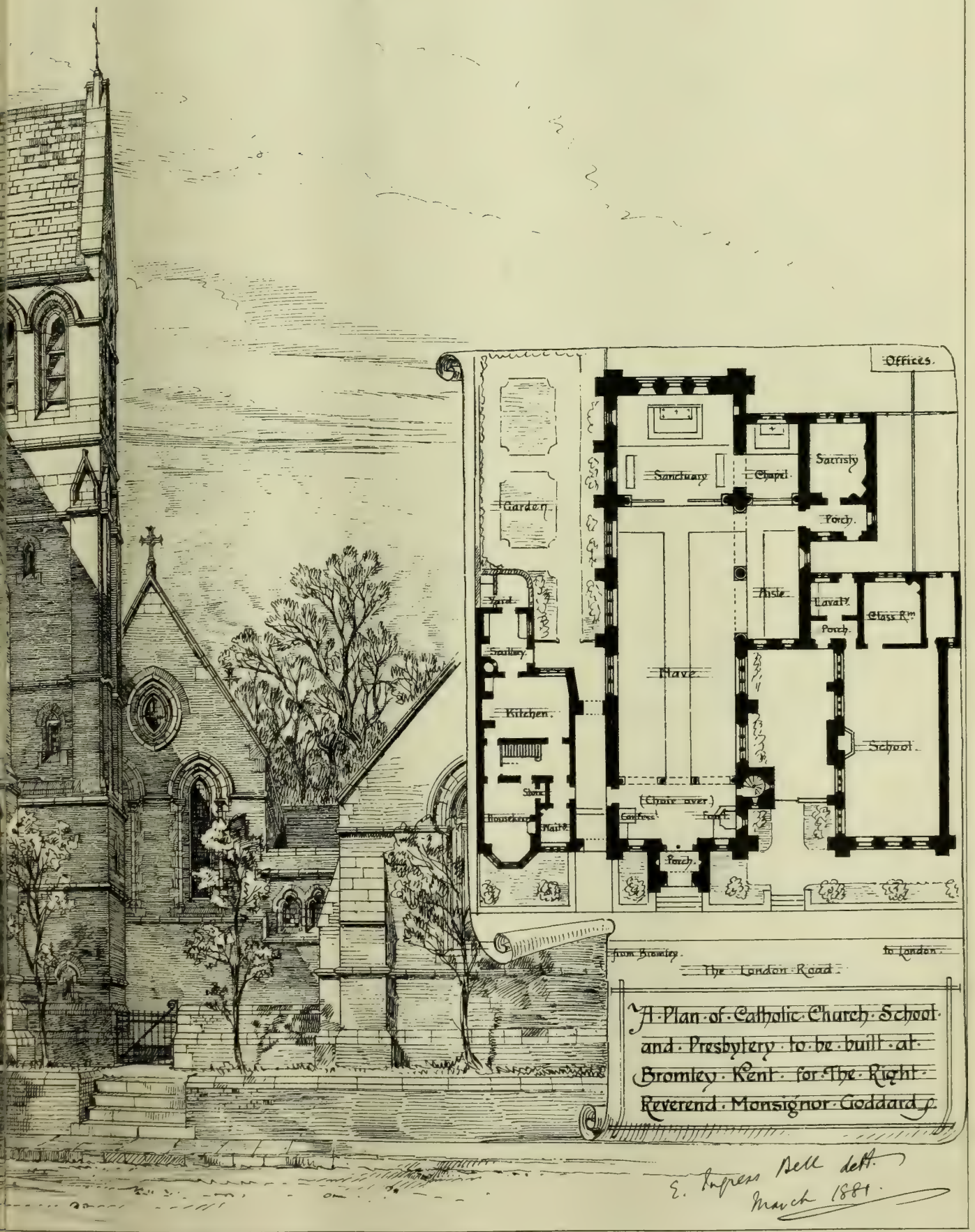


Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W C

TOWER OF S·IOHN'S·CHVRCH·CHESTER· WHICH·FELL·DOWN·APRIL·1881·



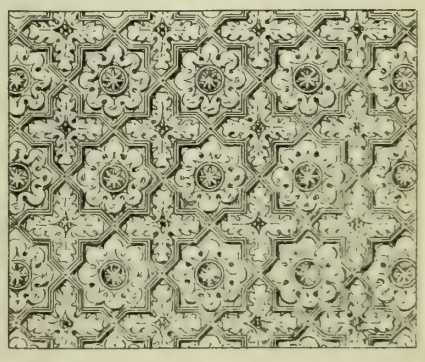
E. Ingress Bell Arch'



A Plan of Catholic Church School and Presbytery to be built at Bromley Kent for The Right Reverend Monsignor Goddard.

E. Ingress Bell delt.
March 1881.

Photo Lithographed & Printed by James Akerman 6 Queen Square W.C.



·SMALL·PATTERNS·FOR·FILLINGS·&·DADOS·

Photo-Lith. by Bedford, McNeil & Co., 7 Clement's Inn, Strand, and 5 Queen Square, W.C.

·TYNECASTLE·TAPESTRIES·DESIGNED·BY·W·SCOTT·MORTON·

SELECTED DESIGN

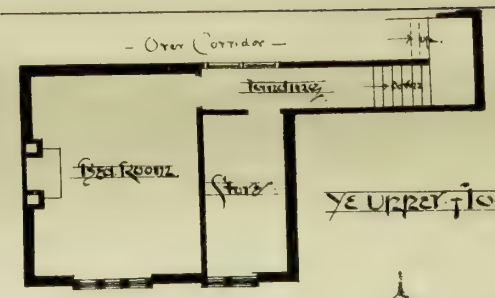
"Building News" Designing Club

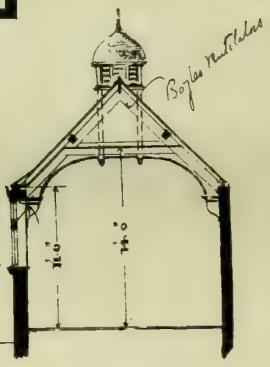
A Cottage Hospital

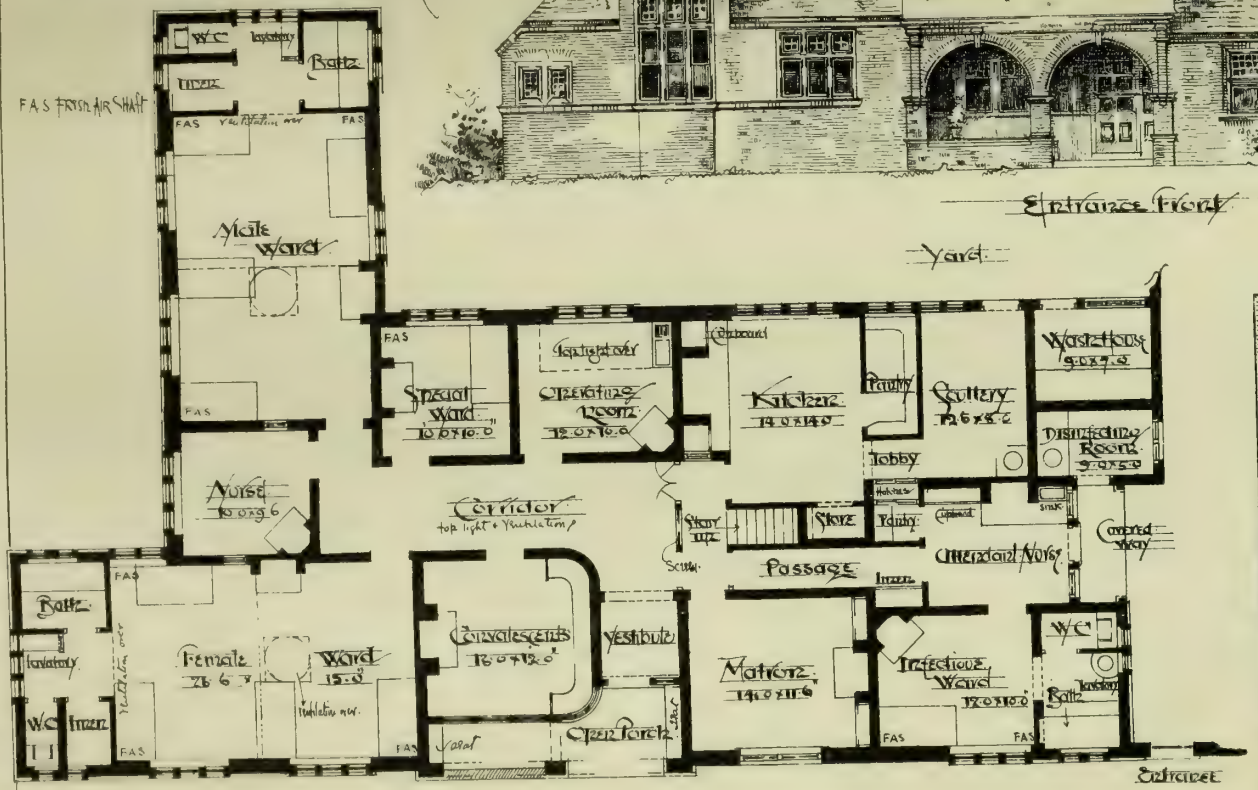
for eight Patients and Provision for Infectious Cases

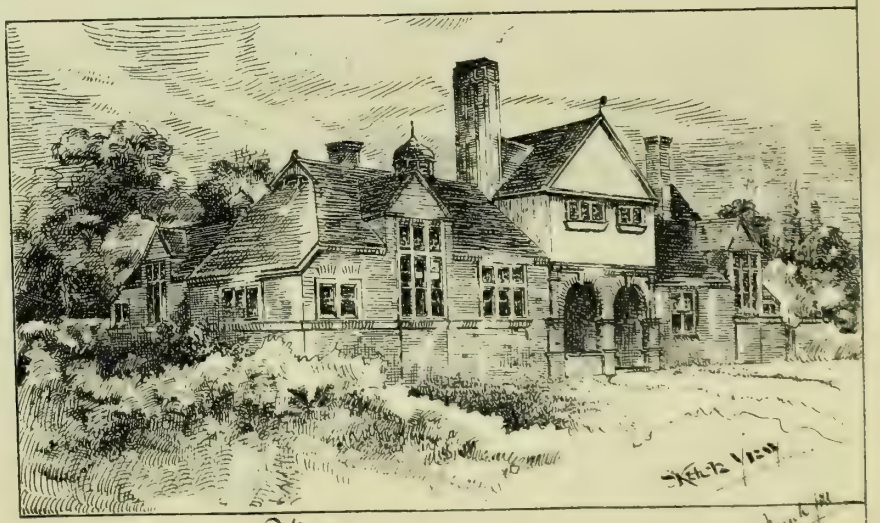
Ventilation

Boyles Extractors in the circular Turrets over Each Ward.
The lower portion of windows, Sashes
The Upper, Casements to open inwards









Photolithographed by Messrs. Ashcroft & Sutton, Soho W.

THE LATE MR. THOMAS BROWN, OF SHEFFIELD.

ON the night of the 29th ultimo, a clever architect—still in early manhood—passed quietly away. We refer to Mr. Thomas Brown, of Sheffield, partner in the well-known and respected firm of Messrs. Innocent and Brown, architects, of George-street in that town. The works of these gentlemen have attracted some considerable attention from time to time; more especially their fine series of Board Schools in Sheffield, and its immediate neighbourhood. A number of them have been illustrated in this journal. (Netherthorpe School, Oct. 24, 1873—Springfield School, May 22, 1874, &c.) Besides school-work, Messrs. Innocent and Brown have carried out a large general practice, and are highly esteemed amongst a wide professional circle. Of their ecclesiastical efforts, the new church of St. James, at Handsworth Woodhouse, in Derbyshire, is a particularly happy one. Mr. Brown excelled particularly in the drawing of details; those he made in wood and stone were peculiarly his own, full of power and originality, whilst artistic in conception in the highest degree. Mr. Thomas Brown was born of Sheffield parents, and as a boy took honours in the local School of Art, then under the mastership of the late Young Mitchell; the late Godfrey Sykes—afterwards of South Kensington Museum—being at the time its second master. In due course he was articled to the then well-known firm of Messrs. Hadfield and Goldie, architects, of Corn Exchange, Sheffield. Afterwards, some 16 or 17 years ago, in conjunction with Mr. C. J. Innocent, who was also an assistant at Messrs. Hadfield and Goldie's, Mr. Brown commenced a successful professional career. The union has continued, cemented by much mutual personal esteem, to the end. Mr. Brown's health has failed him for several years, but he ploddingly continued to work. He took to his bed finally on Easter Monday, and peacefully went to his rest last Friday night. Only 36 years of age, he was twice married, and leaves a widow and a numerous young family. In the outer circle Mr. Brown's quiet geniality of disposition, combined with great natural ability and modest lack of self-assertion, rendered him particularly popular with everyone he came in contact with.

PAINTED GLASS.*

THE history of design in painted glass by Mr. N. H. J. Westlake, F.S.A., the first volume of which he has just brought out, will no doubt be very acceptable to a large class of artists and others, who have hitherto had to pick up their information from actual examples, in a very desultory sort of way. The books published on the subject are either expensive and voluminous, or were not elementary enough for students of the art. Mr. Westlake has ventured to supply the deficiency, and has at least produced a useful work on the subject, though capable of improvement in the arrangement of the matter. The footnotes, valuable as they are, might with advantage have been incorporated in the text. Colour has not been attempted in the illustrations, and if not thoroughly correct, is certainly better omitted. The illustrations given, however, have been taken from rough sketches, and will be found to exhibit the principles of design in painted windows. The volume just published treats of the 12th and 13th centuries, and the other three volumes are to treat of the 14th, 15th, and 16th centuries. The author points out an important distinction necessary to be observed between painted and coloured glass; of course the latter is glass coloured in manufacture, and is very different from glass painted with vitrifiable colour. Painted glass is not an ancient art, like encaustic, fresco painting, tempera, &c. We find no mention of a painted window before the 10th century, though coloured glass introduced in pattern-glazing has been found of earlier date. Skipping the still obscure question of the introduction of painted windows, we find the first chapter dealing with the early examples from the Cathedral of Le Mans, and an illustration is given of some glass fragments which formerly illustrated the Ascension. These fragments, Mr. Westlake thinks, bear internal evidence of belonging to the childhood of the art. The figures have decided Byzantine characteristics in the drapery, and another remarkable feature is the painting of the hair in solid black, a mode undoubtedly anterior to the conventional means of representation by lines. M. Hucher, an authority on glass-painting, believes the Le Mans Ascension window is of the time of Bishop Hoel, 1097, A.D. The colours are beautiful "rich browns and gentle azures," the ruby is splendid and streaked. The arrangement of this window is indicated by the author, and his general conclusion is worth repeating here. It is to the effect that the painted window first suggested itself to the artist as a series of rectangular iron frames, each filled in with a portion of the whole of the picture. The medallion window arose out of this, and the ironwork became gradually ornamental, till the use of mullions changed. Illustrations are furnished to show the process of elaboration from the same cathedral, and some of these are extremely interesting. The Church of Neuwiller on the Lower Rhine furnishes another example of strong expressive lineaments, the hair curled, face slightly modelled, and the border Romanesque. Chartres was one of the earlier centres from which glass-painting spread, and the noted Jesse Tree in one of the west windows of the cathedral, is one of the most valuable specimens of 12th-century work. The window is engraved and described with much discrimination. The ruby and blue in this, as in other windows of early date, are remarkable for variety of tone in each piece, a quality which, as the author hints, is not known in most of the German painted glass imported into England, which is always flat and crude. We are glad to find Mr. Westlake directing attention to this peculiarity in all old glass—its absence of smoothness and evenness of colour which most artists aim at. The 12th-century glass of Angers Cathedral, the Abbey of St. Denys, Vendome, Chalons, St. Quentin, and Strasbourg, is described and illustrated by specimens, and the author points to the difference in style of figure and ornament. After the French examples, the art of the 12th century in England naturally follows, and the resemblance of English to foreign art is forcibly pointed out, the author alluding to which cites an incident pointed out to him by Mr. Burges, who somewhere read of a treaty between Louis and Henry II., in which a clause bound Louis to allow one of his best artists in glass to come to England. This is unverified, though it bears out what has been generally observed in the other arts. The *résumé* given to assist the reader's memory is a useful feature of this treatise, as the differences of style in the features and draperies are illustrated on one page, so that they can be compared. The remaining chapters are taken up with the thirteenth-century style, as exemplified at Chartres, Rheims, Bourges in France, and at Canterbury, Lincoln, Salisbury, &c., in England. A few of the single figures and compositions are illustrated, and the whole work is full of practical suggestions to the student and artist. The last chapter deals with grisaille and quarry window—examples of which are to be found in Salisbury Cathedral and Chapter House. Ample quotation from Mr. Winston, Viollet le Duc, and other authorities add to the value of this useful treatise.

* A History of Design in Painted Glass. By N. H. J. Westlake, F.S.A. Vol. I. J. Parker and Co., Strand, and at Oxford.

SLOW-COMBUSTION STOVES AND ART TILES.

MESSRS. BARNARD, BISHOP, AND BARNARDS, of the Norfolk Ironworks, and Queen Victoria-street, E.C., have contributed much by their enterprise to make our grates and fireplaces at once economical in the consumption of fuel and avoidance of smoke, as well as artistic accessories to our rooms. These "slow-combustion stoves," constructed of firebrick in a special manner, are too well known to our readers to need description; and not the least merit of them is their artistic character compared with the ordinary grates of ironmongers. Some of the new patterns lately introduced, and shown in Messrs. Barnard and Co.'s illustrated price-list, are very effective and simple. There are no useless twirly-whirly ornaments to get choked with dust, but the edges are neatly reeded, of a rectangular form, and the sides and top panels are relieved by geometrical diapers, interspersed with pleasing medallions or foliage in a Japanese style. The stoves are fitted with air-tight register doors, and with sliding blowers, and can be had with curved, splayed, or flat iron sides. They are made in several varieties, Berlin blacked, electro-bronze, or polished brass. An 18in. Berlin-blacked stove, with fire-bars 15in. wide, costs £1 10s.; in electro-bronze it is £2 2s., or £3 if relieved with polished brass top panels. In connection with these stoves, Messrs. Barnard manufacture art-painted tiles, of very agreeable patterns, on white, blue, buff, and other grounds. These are 5in. and 6in. square. Of the several patterns made, the "tulip," "daisy," "chrysanthemum," "iris," "Japanese," "passion-flower," and "papyrus," may be cited as especially good ones. Unglazed hearth-tiles, in a variety of dark colours, are made by the same firm. Garish and vulgarly-designed tiles are now so common, that it is satisfactory to find this firm giving their attention to the production of tiles of good design and colour, and moderate price.

The designs of carved-wood mantelpieces is another speciality. We notice in the new catalogue a few very effective and simple designs, showing the stoves, tiled sides and hearths. Some of these are made at low prices, in deal, painted or varnished. A very effective mantelpiece, with moulded jambs and mantel, and a frieze and moulded shelf, is shown in design B. In painted deal this is £5 10s., in wainscot or American walnut £10. Another very effective design shows a series of art-painted tiles, or Japanese lacquers, introduced in the mantel below the shelf. Some of the designs are very elaborate in the overmantels, and all sorts of arrangements with bracketed shelves for china, and mirrors, are shown suitable to all tastes and pockets.

CHIPS.

At a meeting held in the chaper-house of Salisbury Cathedral on Tuesday week, plans prepared by Mr. G. R. Crickmay, of Weymouth, the diocesan architect, were approved for altering the ancient edifice, known as Audley House, into a Church House for the diocese.

Working Men's Club buildings are being built near the old parish-church of St. Nicholas, Brighton. The premises comprise mission, reading, and club rooms on successive floors, and in the basement, kitchen and living-rooms. The builders are Messrs. Lynn and Son, of Brighton, and the cost will be about £900.

Works of water supply for the village of Dovenby are about to be carried out by the rural sanitary authority of Cockermouth, at an estimated cost of £430. Mr. Pickering is the engineer.

A two-light window in the new chancel of St. Augustine's Church, Halifax, is about to be filled with stained glass by Messrs. Powell, of Leeds and London.

Mr. Jepson, of the firm of Jones and Jepson, builders and contractors, was accidentally drowned on Saturday night while making a midnight inspection of the waterworks extension at Ely village, near Llandaff.

The local board of Warminster adopted last week plans and a scheme prepared by Mr. Martin, C.E., for the disposal of the sewage of the town by irrigation upon low-lying meadows known as Bright-mead and Penny-moor. The initial cost is estimated at £1,800.

New London School Board buildings were opened on Wednesday week in Duncombe-road, Upper Holloway. They accommodate 360 boys, 360 girls, and 478 infants, and the expense has been £10,517 for buildings, and £3,058 17s. 6d. for site, the cost per head being £11 6s. 7d.

The chancel of Christ Church, Forest-hill, S.E., is about to be decorated under the superintendence Mr. Christian. The work will be carried out by Mr. Howe, and heating apparatus is to be placed in the church, and other improvements effected at the same time.

It is intended to complete the rebuilding of All Hallows' Church, Bispham, near Blackpool, which will include four additional bays in the nave and the erection of a tower, in the course of 1881-2. By the extra bay in the church already completed, about 100 additional sittings have been secured. The new structure, which is of Early English design, is being erected from the drawings of Mr. John Lowe, architect, of Manchester.

The county pauper lunatic-asylum at Stafford is about to be enlarged and extended from the plans and specifications of Mr. Robert Griffiths, of Stafford, the county surveyor.

Building Intelligence.

Besford.—St. Peter's, Besford, the only half-timbered church remaining in Worcestershire, was reopened on Wednesday week after restoration from the plans of Mr. Hopkins, diocesan architect. The church is a simple parallelogram on plan, consisting of nave 42ft. by 16ft., and chancel 22ft. by 14ft., and the whole of nave has framed walls. The chancel is of stone, but retained its original roof, a mutilated rood-loft, and the couplet window at east-end having wooden jambs and tracery. The church has been paved with encaustic tiles, Godwin's being used in the chancel. Mr. Joseph Cook, of Hartlebury, was the builder, and Messrs. Martin and Evans, of Cheltenham, executed the carving. The cost has been about £1,800, exclusive of some special gifts.

Broughton.—On Saturday was reopened the little church of St. Lawrence, Broughton, near Newport Pagnell, after restoration by Mr. William White, F.S.A. Great interest is given to the church by a number of old mural paintings. These were opened out many years ago by the present rector. There were indications of several successive layers of subject paintings, in distemper, over them. They are of late Mediæval date, quaint and rude, and of treatment almost unique. In them are represented St. George with the Dragon, and a diminutive princess; St. Helena finding the cross; and a *Piéta*, with men holding up, amongst other things, a heart, a hand, and a foot, torn from the Divine Person. Many other remnants of paintings cannot be deciphered.

Carnarvon.—The renovation of the castle is being carried out under the personal supervision of Sir Llewelyn Turner, the deputy-constable. The outer walls have been divested of the self-sown plants which partially concealed them, and the joints have been pointed and cemented. The stone staircase of the turret attached to the Queen's Tower has been completed to its full height of 80ft., and the tower at the north-east end of the castle ditch, and its stair-turret, which had been inaccessible for ages, have been thoroughly repaired, and the chimney-pieces are entirely renewed. The work at present is chiefly confined to the turret and tower near the King's entrance, the entire staircase of which was destroyed through an explosion of gunpowder. This staircase is renewed to the top of the tower, and will in a few months be complete for the turret summit. The ramparts have been asphalted, the wall near the Queen's-gate has been underpinned and made secure, and the castle moat opened for a distance of 500 yards. There being no sandstone or gritstone quarry near Carnarvon, the materials for the mullions, staircases, and corbels have been obtained from the Talacre quarries, Flintshire.

Corkbeg. — A new Protestant Church of St. Michael has been built beside the older one at Corkbeg, Cork Harbour, and was consecrated on Saturday. It is constructed of local sandstone, with dressings of cut limestone. The interior is lined with red brick, with bands and string-courses of white and black brick. The church is planned to accommodate 200 persons. The western gable has two lancet windows, with a wheel window over. The nave is of seven bays, and the windows are filled with cathedral glass. The three-light eastern window is filled with stained glass representing Christ as the Good Shepherd, the Blessing of the Children, and Raising of Lazarus. The roof is a steep-pitched one, the woodwork, which is stained and varnished, being all exposed on the inside. The edifice has been planned by Mr. Wm. Atkins, architect, of Cork; but the porch and tower remain at present unexecuted. The cost has been £2,200, exclusive of many special gifts.

Darwen, Lancashire. — To-morrow the foundation-stone of a Congregational school-chapel, at Darwen, will be laid. The building is in the Gothic style of architecture, built of local stone, and faced with selected parpoints, and will be two stories high. On the ground-floor is the large school-room 50ft. long and 40ft. wide and 16ft. high, with entrances at the sides of the building for the scholars. On the first floor is a large room which will be used at present as a chapel, extending over the school-room. The chapel is calculated to accommodate 400 people. The plans have been prepared by Mr. Henry Pinchbeck, architect, of London. The contracts for the different trades have been let separately to local contractors.

Durham.—New buildings are about to be erected at No. 3, Sadler-street, Durham, from designs by H. T. Gradon, architect, of this city, for Mr. John Shields. The entire block of buildings are intended for a draper's and silk mercer's premises, and consist of a shop on the ground-floor 80ft. long, by an average width of 20ft.; underneath this shop is to be a large furnishing room, 48ft. by 17ft., with access by staircase from shop above, and over the shop, approached by another staircase from same, is to be a large show-room, 37ft. by 20ft., and two fitting-on rooms for the dress-making and mantle-making department. The two floors above are occupied by rooms connected with the same department and ware-rooms. The chief rooms are to be heated by a hot-water apparatus, for which provision is made in the cellars. The front to Sadler-street is designed in the Queen Anne style. Sadler-street, though one of the main streets in the city, is only 21ft. wide, and the corporation, in spite of their long talked-of street improvement schemes, rather than avail themselves of such an opportunity of widening this thoroughfare, will not give compensation for setting the new premises back, and accordingly it will be built to the present street-line. The sole contract has been let to Messrs. Geo. Gradon and Son, for the sum of £2,285. The sub-contractors are Mr. John Grant, mason; Mr. James Laidler, plumber and smith; Mr. Roger Rule, slater; Mr. Thos. Nesbitt, plasterer; and Mr. Wm. Hodgson, painter and glazier, all of Durham. The taking down of the present premises is now progressing satisfactorily.

Great Stanbridge.—The parish-church was reopened after internal restoration, and an addition to the churchyard consecrated, on Wednesday week by the Bishop of St. Alban's. The roofs, which were kingposts with plaster ceilings, have been rebuilt in hammer-beam construction of 14th-century character. The high pews and unsightly gallery have been removed, and richly carved oak benches, executed at Bruges for Messrs. Buckley and Co., substituted. Messrs. Buckley have also supplied a new pulpit, lectern and reading-desk, and Communion-rails. A rere-has been erected containing two panels, with subjects in sepia, painted on kamptulicon, by Miss M. H. Harte, of Blandford. The subjects are taken from the late Mr. J. H. Redfern's work in Gloucester Cathedral reredos. Messrs. Campbell and Co.'s tiles have been laid throughout the church, and the space before the altar is laid with mosaic in tessera work, executed by Messrs. Oppenheimer and Co., of Manchester. The new heating apparatus is by Messrs. Porritt, of Bolton-le-Moors. A two-light stained window has been put in by Mr. C. de Morini, of London. A pentagonal vestry, faced with rag-stone, has been added to north side of chancel. The work has been carried out under the supervision of the rector, at a cost of £700.

Metropolitan Board of Works.—At the meeting of this board on Friday, a deputation from St. Olave's district board was introduced by Mr. Tolhurst, who presented a memorial asking for an extension of the Tooley-street improvements. It was stated that the first section of the new thoroughfare had been completed and opened, but that relief to the crowded traffic would not be secured unless the widening of Tooley-street were continued from above Bermondsey-street to Dean-street. The memorial was referred to the works committee, as were also letters from the Whitechapel Board of Works and the Bermondsey Vestry, urging the necessity for a new bridge to the eastward of London Bridge. With reference to the proposed bridge at Putney of the Guildford, Kingston, and London Railway, an important report was presented by the Parliamentary Committee. It recommended that on the promoters of the Bill giving an undertaking to the board that the Fulham and Putney Bridge shall be of five arches instead of nine, shall have a headway of not less than 20ft. over Trinity high-water mark, shall be as nearly at right angles with the centre of the river as the promoter's limits of deviation will allow, and shall contain accommodation for the free passage of foot-passengers across the river, the board's opposition to the Bill shall be withdrawn. It having been stated by Sir Joseph Bazalgette that the proposed railway-bridge would be 230 yards from the new Putney Bridge, on which the board propose to expend £400,000, the report was adopted by 21 votes to 4.

Tamworth.—On Saturday week the Bishop of Lichfield consecrated St. Chad's Church and Churchyard, Hopwas, Tamworth. The church consists of a nave, chancel, and sacrarium, with projecting wings at each side of the chancel, the one on the north side being the organ-chamber and the other the vestry. The style of the church is Perpendicular Gothic. The walls of the church over the chancel proper are carried up higher than the rest of the building, and form a low, saddle-back tower, the roof of which is utilised as a bell-chamber. An octagonal turret, covered with oak shingles, rises up from the centre of this roof, and is surmounted by a wrought-iron cross and vane. The works have been carried out by Mr. John Deakin, of Lichfield, from plans prepared by Mr. Douglas, architect, of Chester. The church has cost £2,322 9s. 2d.

CHIPS.

Professor C. T. Newton will give to-day (Friday) the first of a course of lectures on Greek and Roman sepulchral monuments, rites, and games, at University College. The public will be admitted to the first lecture without payment or tickets.

Extensive alterations have just been commenced in the University buildings, Durham. The inadequate Mathematical and Classical class-rooms, and the gymnasium, have been pulled down, and in their stead will be erected a block of new buildings, Tudor-Gothic in style, facing the Palace-green, and affording increased accommodation. Messrs. Robson and Son, of Durham, are the builders.

A new banking-room was opened for the Bank of Bolton, Limited, in Bolton, on Monday. It is in style Classical, freely treated, and measures 77ft. 6in. by 30ft. 6in., and 33ft. high to ridge-piece. The dado and doors, and all fittings, are of Dantzic oak, and the upper part of walls are lined with marble mosaic. Behind this room is the strong-room, and below are book and stationery-stores, lavatories, and heating-chamber. Mr. George Woodhouse, of Bolton, was the architect, Mr. D. Walch the clerk of works, and Messrs. J. H. and D. Marsden, of the same town, the contractors.

The new premises of the Wolverhampton Blue-coat school, were opened on Saturday. The buildings are of red brick, and consist of a central block with two projecting wings. In the centre, on ground floor, are the dining-hall, day-room, and staircases, lavatories, and cloak-rooms; the ground-floor of south wing is the general schoolroom for boys and girls, accommodating 80, and in the north wing the master's and mistress's private rooms and kitchen. The upper floor of the south wing is a boys' dormitory, and that on north the girls', separated by the bedroom of the master and mistress. On a higher floor are the sanitoria, store-rooms, and baths. Mr. T. H. Fleeming, of Wolverhampton, is the architect, and Mr. H. Lovatt, of the same town, the builder.

A carved oak lectern, with brass railings, has just been placed in Worcester Cathedral as a memorial to the late Dean Yorke. It was supplied by Messrs. Jones and Willis, of London and Birmingham.

New assembly-rooms, erected at an expense to Sir Spencer Maryon-Wilson, the donor, of £1,300, were opened on Tuesday week. Mr. John Rowland is the architect, and Mr. Tansett, also of Charlton, is the builder.

Mr. Abernethy, as President of the Institution of Civil Engineers, and Mrs. Abernethy will give a *conversazione* in the South Kensington Museum, under official sanction, on Friday, the 3rd of June, being the fifty-third anniversary of the date of incorporation of the society. The sixty-fourth session will terminate on Tuesday, the 31st inst. All applications for admission, to be dealt with prior to the recess, should at once be lodged with the secretary.

Mr. Samuel Whitaker, of Bubwith, for 17 years surveyor to the Selby and Market-Weighton turnpike trust, was last week elected, from amongst 60 applicants, surveyor to the Selby highway board, at a salary of £80.

The vestry of Camberwell held a special meeting on Wednesday week to revise the salaries of the parochial staff, when the remuneration of Mr. Reynolds, the surveyor, was fixed at a maximum of £750, that of the draughtsman at £220, first clerk £160, and second clerk £100. Dr. Bristowe's, the medical officer of health, salary was fixed at a maximum of £200.

COMPETITIONS.

Carlisle.—A meeting of the Governors of the Carlisle Grammar School was held on Saturday afternoon. The chief business was the selection of a set of plans for the new school buildings. After a careful examination of the various sets sent in, the Governors unanimously selected for the first premium of £100 the plans of Messrs. Hetherington and Oliver, under motto, "Health," and for the second premium of £50 those of Mr. E. R. Robson, of London. Messrs. Hetherington and Oliver have received directions to prepare working drawings and specifications, and a Building Committee, consisting of the Mayor, Mr. MacInnes, Canon Prescott, and Mr. Milburn, has been appointed to confer with the architects, with power to modify the plans where it is desirable, and to take in tenders for submission to the Governors. The purchase of the site has been completed for the sum of £3,250.

Drogheda. — The Venerable Archdeacon Murphy, P.P., of Drogheda, appointed Mr. G. C. Ashlin, of Dublin, to adjudicate in the 25 designs submitted in competition for the erection of the proposed new church. Mr. Ashlin's award has been made and adopted by the committee. The design placed first is "Con Amore," and the authors, Messrs. O'Neil and Byrne, have been employed to carry out the work. The design placed second was submitted under the motto "A. M. D. G. Catholicus," but as it was unaccompanied by any letter, it is not known at present who is the author. All the designs are to be publicly exhibited. Much labour seems to have been wasted by some of the competitors through their neglect to make themselves acquainted with the site, or to obtain information respecting local materials and ideas. For instance, the author of one very good design, "Faith," evidently misled by the low price of the local stone mentioned in the instructions, proposed to erect a church with a nave 40ft. wide and 200ft. long, spanned by stone arches, which would cost at least twice as much as the sum stated. The local stone mentioned is a very hard limestone, very cheap in the rough, but comes to about three times the cost of most English stones when worked. This design had also another fatal fault, in that it brought the building too near the line of street (which is rather narrow), so that the effect of a very fine and simple front would have been lost. Moreover, the style adopted was too Early to enable the existing windows and other portions of the church to be utilised. The proposed cost stated in the instructions— £15,000, for a church to accommodate 1,500 persons, was evidently very small, and it was of the utmost importance to use as much of the old material as possible, and this seems to have been made clear enough in the instructions. About £4,000 had been spent on a chancel to the present church, and £600 on aisle-windows last year, so that designs which disregarded this available material were, of course, at a disadvantage.

Eastern Counties Asylum for Idiots.—We understand that nine sets of designs for the enlargement of this asylum have been sent in under the following mottoes:—"Quid," "Potestas," "Sympathy," Experience," Ways and Means," "Spero," "S. F.," "Orandum est ut sit Mens sana in Corpore sano," "Camulodunum."

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Birmingham Architectural Association.—On Saturday afternoon (the 30th ult.) a party of members visited the new mission-church of St. Michael and All Angels', at West Bromwich, near Birmingham. The architects, Messrs. Wood and Kendrick, of West Bromwich, met and conducted the party.

St. Barnabas Church, Norfolk Island, was consecrated in December last. It is built of a yellowish-brown sandstone quarried on the island, with shafts to windows and doors; pavement and font of red and black marble from Devonshire. The style is Decorated Gothic, and the building consists of nave, 54ft. by 57ft., and 17ft. high to wall-plate, and the semicircular apsidal chancel, the chord of which is 24ft. by 12ft. The carving of caps, &c., has been executed by the Rev. R. H. Codrington, who supervised the work. The choir-organ of 500 pipes was a special gift, and was built by Mr. Henry Wilson, of London.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

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Handsomely bound in cloth, Vol. XXXIX. of the Building News. Price Twelve Shillings. Order at once, as only a limited number are bound up.

N.B.—Cases and vols. must be ordered through a bookseller or newsagent, as the regulations of the Post-office prevent them from being sent by post.

Received.—J. and. W. B.—R. W.—F. J. P.—A. H. Co.—R. W.—W. H. B. Co.—B. of W.—A. W.—J. M. G.—C. H.—W. G.—T. R. and Co.—B. S.—W. H. S. and Son, D.—M. T.—Midland.—J. Co.—E. and Co.—J. H. and Co.—B. of B.—H. B. Co.—W. T. Sons.—R. P. C. Co.—J. T. B.—S. and Co.—R. B.—J. C. E.—L. and N.W. Ry. Co.—F. W. R. and Co.

Ruswarp. (You saw our review of the book, and can surely form an opinion from that?)—A. S. P. (Murray's "Handbooks to the English Cathedrals," John Murray, Albemarle-street.)

"BUILDING NEWS" DESIGNING CLUB.

Drawings Received.—Eclipse, Good Luck to Your Fishing, Bonus Hominus, Quiet and Simple, Hamlet, Tempus Fugit, Rex, Kairon in circle, Iota, Squib, T. A. H., Snow Flake, Beta, Strad, That's my Idea, Cambria, Home, Nemo, Pupil J., Jack Daw, Merit, Trial, Ambition, V in circle, Con in circle.

Correspondence.

THE PRESIDENCY OF THE R.I.B.A.

To the Editor of the Building News.

Sir,—I have been asked by several Fellows of this Institute to prepare and circulate a statement relative to the approaching election of a President. I have accordingly drawn up the accompanying memorandum, and I shall feel obliged if you will be kind enough to let it receive your careful attention.

As I have been nominated by the present Council on the list from which the new Council is to be elected, and it may consequently seem as though I were interesting myself in the Presidential election with a view to give prominence to my own name, I have thought it my duty to write to our Secretaries requesting them to withdraw my name from the balloting-list.—I am, &c.,

T. Roger Smith.

10, Lancaster-place, Somerset House, W.C., 3rd May.

MEMORANDUM ADDRESSED TO THE FELLOWS OF THE INSTITUTE.

An accurate knowledge of the circumstances out of which the present situation has grown is so important to a right understanding of it, that it is thought necessary to offer a brief recapitulation of them in the form of a memorandum.

In the first session of Mr. Charles Barry's Presidency, 1876-1877, a series of revised bye-laws carefully prepared upon the report of a special committee was adopted. Among these were the following:—

Bye-law XXVI.—The Senior Vice-President, in relation of office, shall be nominated as President, unless he give notice to the Council at least two months previous to the Annual Meeting of his intention to decline the Presidency; and in that case the other Vice-Presidents, in order of their seniority in that office, shall be so nominated. Any Vice-President who shall twice decline to be nominated as President shall retire from office. No member who has filled the office of President for two successive years shall be again eligible for the Presidency until the expiration of two years from the termination of his office.

Bye-law XXX.—Should any additional name or names be proposed for election by any two Fellows, such name or names must be sent by them to the Council four weeks before the Annual General Meeting, with a written undertaking by the nominee or nominees to serve if elected. Such name or names shall then be added by the Council to the said List, with the names of the Proposers appended; and the List thus altered shall be the Balloting list for the Annual Election, and shall be issued to all Members two weeks before the Annual General Meeting.

Under these bye-laws, which are still in force, and which have not been revised or withdrawn, the council at the following election proposed as President for the Session 1877-78 Mr. Charles Barry, and as Vice-Presidents Mr. Ferrey, Mr. Street, and Mr. Horace Jones.

Under bye-law 30, the name of Mr. Whichcord was added to this list on the proposal of Prof. Donaldson and Mr. T. H. Wyatt, in recognition of his services as Chairman of the Improvement Committee, and at the election that gentleman obtained the largest number of votes. He thus became Senior Vice President, and as such, the Nominee of the Institute (in general meeting) for the Presidentship, to which he succeeded accordingly by a unanimous election at the close, in May, 1880, of Mr. Barry's term of office.

This is an excellent example of the legitimate working of the new bye-laws, which were framed with a special wish to avoid as far as possible contested elections or disputes in connection with the Presidential election, and yet to provide for freedom of choice. Here was really "a distinct election for the President's chair,"* with four candidates.

The other Vice-Presidents elected at this time (May, 1877) were Mr. Street and Mr. Ferrey.

In May, 1878, Mr. Charles Barry was again elected President of the Session 1878-79, and the Vice-Presidents were Mr. Whichcord, Mr. Street, and Professor Hayter Lewis.

Towards the close of the Session Mr. Street retired from the position of Vice-President, and the letter in which he assigned his reasons for so doing is as follows;—

From "Building News," 11th April, 1879.

"Dear Mr. White,

"This year (and next year it will be the same) so much of my time is taken up by serving on the Council of the Royal Academy, that I really have no time to spare for other similar duties, and as, under the present system at the Institute of Architects, any chance of getting new blood into the Council ought to be seized, I feel that I ought to resign my post as Vice-President and member of Council. Will you be so good, therefore, as to take care that my name is struck out of the House List?

"Believe me, yours very truly,

"(Signed) George Edmund Street,

"14, Cavendish-place,

"Cavendish-square, W.

"March 20th, 1879.

"W. H. White, Esq., Sec. R.I.B.A."

At the election which closely followed this retirement of Mr. Street, namely, May, 1879, Mr. Whichcord was, in conformity to bye-law 26, nominated President, and elected by acclamation. The Vice-Presidents nominated were Professor Lewis, Mr. E. M. Barry, R.A., and Mr. Horace Jones. They were elected in the following order—1. Lewis, 2. Horace Jones, 3. Barry.

Mr. Whichcord was re-elected President in May, 1880, and is now President, the Vice-Presidents being Professor Lewis, Mr. Horace Jones, and Mr. Ewan Christian.

Professor Lewis, the senior Vice-President, has intimated his desire not to serve as President, on the score of ill-health, and, accordingly, Mr. Horace Jones becomes the Institute's nominee for the Presidentship in the session of 1881-82.

When the time for publishing the list of names was approaching, Mr. Horace Jones, however, took the step of voluntarily offering to stand aside if Mr. Street desired now to be elected President. He communicated this offer to the Council of the Institute, and after doing so sent a memorandum of his communication to Mr. Street, inclosed in a private letter, which was answered.

Mr. Horace Jones, in the course of this memorandum, pointed out that his being next in position to Mr. Lewis was the act of the general body, and said, "It would be showing poor return for the confidence thus placed in me, and I believe still continuing, did I lightly abandon my position." He then referred to the fact that Mr. Street, had he not resigned, would in due course have been this year nominated by the Council as President, and added, alluding to the resignation, "that this act was a source of regret to many who had looked forward to his filling the Presidential chair, a position to which his talents, character, and position entitle him, as would be generally acknowledged." He then proceeded as follows:—

"Now, as I am entitled to a step earlier than I had expected when the Institute put me second to Mr. Lewis, although above Mr. E. M. Barry, it may appear somewhat hard or ungenerous dealing on my part if I were not to be willing to stand on one side for Mr. G. E. Street, if, regretting his resignation, he desires now to stand in Professor Lewis's position as senior Vice President. In the first instance, this substitution of Mr. G. E. Street for myself is, I submit, not a matter for the Council to interfere in as a Council (individually they may do what they like): and the suggestion of such substituted nomination does not arise in the slightest degree from any diffidence in either myself fulfilling the duties, or in the Institute confiding those duties to me, or because it would be in any way inconvenient or irksome to accept the honour; but simply that I do not think it fair or courteous

* See Mr. Street's letter published in *The Builder* for 23rd April, 1881.

to a former colleague to snatch the opprtunity afforded by what was, perhaps, a hasty, and certainly regretted, step, by others. If, therefore, Mr. G. E. Street should intimate his desire to become President in the ensuing year, I am willing, as before stated, to stand on one side, but I have no wish to do so under other circumstances."

The present writer regrets that he is not in a position to quote the letters which passed between Mr. Horace Jones and Mr. Street, but that this offer was not accepted is clear from the letter signed by Mr. Street and published in the *Builder* of the 23rd April.

This declining Mr. Jones's offer of course left him free.

Subsequently Mr. Edis and Mr. Spiers addressed a circular letter to the Fellows of the Institue on the subject of the election, and Mr. Brooks and Mr. Martineau nominated Mr. Street under bye-law 30, and his name has been added to the original ballotting-list.

The contest thus set up is not a personal one, but on the personal question thus much, at least, requires to be said. Every supporter of the Institute's nominee desires to recognise heartily Mr. Street's personal and professional position. It is, at the same time, claimed that the senior Vice-President has a professional and personal standing which places the suitability of his election beyond all doubt. On this point, as well as on the course of action pursued, a letter, the last ever published by the late William Burges, and which appeared in the Building News of the 1st of April, is much to the point. The following are the principal paragraphs :—

"Sir,—Will you allow me to protest against the idea that the election of my friend, Mr. Horace Jones, would be highly derogatory both to the Institute and to the profession?

"It is not a question of electing the most suitable man. On the contrary, it is simply one of routine, like the election of the Lord Mayor.

"I have reason to believe that many Fellows of the Institute think with me, that the sooner we return to the old mode of election the better.

"Let us therefore demand a special meeting, discuss the question, and, if strong enough, effect a change; but it appears to me very unfair to commence the business by making a set at Mr. Horace Jones, who, as an architect, will not suffer in comparison with either the present or past President."

What more might be said on the question of principle has been so well put in a letter which appeared on the 16th April under the signature of "Onlooker," that a quotation of its principal paragraphs may very suitably conclude this memorandum :—

"Both candidates are members of a chartered society which is governed by laws made by the members in general meeting under the authority of the Charter, and some three years ago both were members of the governing body on whom the Charter places the duty of carrying out the laws made by the members.

"By the operation of those laws, and the votes of the members in general meeting, Mr. G. E. Street, R.A., was placed in the position that, on the election of Mr. Whichcord as President, he would have become senior Vice-President, and under ordinary circumstances would now, by the operation of the same laws, be the official candidate for election as President, and it is equally certain that under such circumstances his election would have been the *unanimous* act of the whole body.

"Mr. Street thought fit to resign his position on the governing body, and thus, by his own voluntary act, he sacrificed the possibility of so becoming President, under the present constitution, without subverting the principle of those laws to which he, in common with all other members, is subject.

"Had this resignation arisen, as alleged by Mr. Edis, from 'his disinclination to accept any nomination by mere order of seniority under the new bye-law,' * the proper course would have been for him or those who think with him, such as the unknown but 'influential body of the Fellows' of the circular issued by Mr. Edis and Mr. Spiers, at some convenient opportunity during the last two years, to have taken the steps provided by the laws for inducing the members to alter the bye-law which they dislike.

"Had Mr. Street regretted the false step of resignation, there must have been opportunities by which he might have again constitutionally taken his place among the vice-presidents, and the impending contest might then easily have been avoided, and his 'prominent claims' received that recognition which they certainly pre-eminently merit, but which seems to be not possible now.

"Whatever the relative merits of the two candidates may be, there cannot be any question upon whom the responsibility rests of having originated a contest which in any event cannot but have a prejudicial influence on the prosperity of the Institute, and which, by a due respect for its constitution, might easily have been avoided; and Mr. Edis's letter should have the conclusive result of determining all desiring to maintain order and respect for authority to support Mr. Horace Jones.

"Onlooker."

In a word, the real point at issue seems to be whether those who have formed themselves into a society, and agreed to submit to certain laws, are not in honour and duty bound to abide by those laws till they are altered or repealed.

T. R. S.

R.I.B.A. EXAMINATION.

Sir,—As the time is again approaching for the Architectural Examination at the Institute, perhaps I may be permitted to suggest to the Council, through the medium of your valuable paper, the desirability of altering the wording of the certificates which they award to successful candidates in the Proficiency section of this examination, in order to make their real value more apparent.

In the printed rules and directions for the Examination in 1880 it was plainly stated that a Proficiency certificate "shall be regarded as a diploma of professional qualification," but the certificate itself does not contain any clause to this effect. It simply says that so and so "has been examined in the Class of Proficiency, and found by the Examiners to deserve this certificate," without stating its value.

I have spoken to three or four of the successful candidates, and find that they are as much disappointed as I am with their certificates, and indeed almost ashamed of them.

If the Examination is regarded as a proper test of professional qualification, why not state this fact on the certificate?

There is one other point I should like to draw attention to—viz., the amount of the entrance fee to the Examination. All Proficiency candidates have to pay 4 guineas, and all Preliminary candidates one-half that sum, on presenting their applications for examination; and as ten of the former and eleven of the latter were examined in 1880, the Institute received in fees upwards of £65. From the annual report of the Institute it appears that the whole expense of conducting this examination was £23, so they made a clear profit of £42.

In view of this result, might it not be desirable to lower the entrance fees in future, and so make it easier for candidates to present themselves?—I am, &c.,

A Passed Candidate.

* See, however, as to this, Mr. Street's letter already quoted *in extenso*, in which he assigns his reasons for resigning the Vice-Presidentship.

STRENGTH OF BEAMS.

Sir,—Your admirable article on the "Strength of Beams" (page 413) was undoubtedly read with great interest by all students of construction. There are many works published dealing with the subject of "Strengths" and "Strains on Materials;" several attempt to popularise this branch of study by avoiding the use of mathematical reasoning or symbols; this method may answer in some subjects, but I do not see how it is possible in a science requiring exactness to do without exact forms of reasoning.

In dealing with beams there is not that element of uncertainty which one feels in designing iron columns and stanchions; in the latter cases we have to depend so much upon the integrity of the ironfounder and the man who makes the mould. Even if we are exact in our calculations in these cases, what are they worth, being based entirely upon empirical formulæ with factors of safety varying from three-fourths to nine-tenths? In this branch of constructions there is much need for more information. There is no reason why the Calculus should not be more generally applied in constructive problems dealing with variables, and anyone who points out how such applications can be made is doing useful service.—I am, &c.

May 1. A. Harland.

THE CHURCH OF ST DOMINIC'S. PRIORY, HAVERSTOCK HILL.

Sir,—During the many years in which I have practised the profession so congenial to my tastes, I have invariably met with kindness, courtesy, and consideration from my brother-architects, and was therefore surprised on my attention being called to an unprovoked and ill-natured attack upon myself, and upon the structure of the Dominican Priory Church, Southampton-road, Haverstock-hill, in the last number of a Review entitled the *Sacristy*, edited by Messrs. Walford and Scott. The article is penned with bitterness, and with the view to depreciate the building and its architect, and is beyond the range of fair and honest criticism. Invidious complaints had formerly been made by a secret foe, at the office of the District Surveyor of St. Pancras, and the sequel explains those proceedings.

The careful and able report made by Mr. Wallen, the District Surveyor, in March last, completely refuted the false and disparaging statements as to the stability of the fabric, and I am glad of the opportunity to place it on record, as it also disposes of the myths and phantoms which emanate from the *Sacristy*.

"Considering all the circumstances of this case, the approval of the original plans by my predecessor, the length of time during which the main structure had been in progress, and the excellent character of the work and materials, I was, and am, of opinion that no further interference or requisition was called for, but that the question of the stability of the building, with all responsibility for it, should be left with the eminent architect who was the author of its design

"There could be no doubt in my mind, however, that some very slight movement at least would result from the settlement of the joints of the roof-principals upon the bolts and straps which had been inserted and fixed.

"I made, on the 15th inst., a careful examination of the building in company with its architect.

"It is singularly free from any settlement in the brickwork of the main walls and arches. Two very slight settlements only appear in the transverse arches, not recent, and apparently resulting from unequal loading of the spandrels when the works were suspended prior to 1878.

"The main piers supporting the nave arcade, which are of cut stone, and cylindrical in form, are bedded in putty with sheets of lead laid therein, the jointing of the beds being very wide. I could discover no fracture of any of these beds either in the stone or in the putty. The height of them, however, was in some cases unequal, evidently resulting from unequal pressure on the putty when it was wet, or unequal spreading of it at the time the stones were set.

"On plumbing the main piers I found a very slight inclination in some cases towards the nave, the extreme case being an inclination of three quarters of an inch in a height of 18ft. There was also in some cases a similar inclination in the direction of the length of the church, which tends to confirm the view that the inclination, as well as the inequality of the beds, is the result of the original setting, and not of any subsequent movement.

"The clerestory inclines outwards on the north side at about the middle of the length of the church to the extent of three quarters of an inch in a height of 6ft., and, near the apse, seven-eighths of an inch in the same height. On the south side it is practically upright.

"The inclination is less than I should have expected during the inevitable settlement of an arched timber roof, well constructed, of this design.

"I have already stated that the design is a bold one, but I do not consider it unsafe. I do not think any movement has taken place since the completion of the fabric, and certainly none that would call for the intervention of the authorities, at present, at least.

"I should recommend the architect (to whom I have sent a copy of this report, and with whom all responsibility should be left) to watch and plumb the building carefully and periodically for some time, but I do not consider this a case for the exercise of the powers contained in the Acts referred to at the head of this report, and I beg to testify accordingly.

"(Signed) Frederick Wallen.
"District Surveyor for West St. Pancras.
"106, Gower-street, W.C."

The hostile criticisms in the *Sacristy*, are evidently not those of one who has studied the plans of old Dominican churches, wherein, as at Winchelsea, Antwerp, and Louvain, there is usually no structural chancel, nor a processional way around the apse of the choir, as in cathedral churches and the larger minsters. The friars did not despise common brick and slate, and some of the most renowned churches of the order, in Italy and Belgium, are of brick.

It is unfair and impossible to judge of the effect of the interior, while it is encumbered with scaffolding, and until funds (about £300) admit of the sculpture of the shapeless masses and blocks of stone into foliated capitals and pendents, when the columns would appear in their true proportions.

They are sound and perfect throughout, not a joint flushed nor a flaw perceptible in the superincumbent arches, and the arcades of the clerestory; the thrust of the transverse arches of the aisles is nullified by the vertical pressure, and the equilibrium of the whole is true, "bold, but not unsafe."

The roof accords with the style of the architecture; the wall-posts and curved ribs of the main principals descending to stone capitals which range with the springing line of the clerestory windows, diminishing the lateral thrust on the upper part of the walls. The internal arched boarding, with transverse and diagonal ribs in each bay, are similar to the roof of the grand Dominican Church of the 13th century, at Ghent, now unhappily destroyed. The window in the principal front bears likeness to that in the same church, while the "uninteresting" two-light windows in the apse, resemble those of the exquisitely beautiful church of the Dominicians at Louvain.

The original design for a stone gallery as at Florence, Valognes, and elsewhere, on corbels with pierced parapet and coping, was found impracticable on account of expense, poverty having proved oppressive from the first, and the aim always having been to obtain as much as possible for as little as possible; but the design, if accomplished, is not likely to have suited the morose taste of the *Sacristy*. For the substitution of the iron gallery, and for the border of red and blue in the temporary glazing, I am not responsible.

The *Sacristy* has studiously suppressed the name of the "designer," and it excites a smile when it is gravely asserted that he "can scarcely have seen, or at any rate have measured an original Mediæval moulding."

In the preface to Mr. J. H. Parker's "Domestic Architecture," published in 1853, mention is made of the Buckler collection of drawings and sketches, "the result of the labours of three generations." Since that date the collection, then unrivalled, has been greatly augmented, and it abounds in measured details from ancient examples of ecclesiastical, military, and domestic architecture.

En tibi læta damus, lætum quæ reddere possint,
Læta igitur læta perlege fronte rogo.
Ludicris Buclere meis sis optime scutum,
Et formidabunt livida tela nihil.

CHARLES ALBAN BUCKLER.

6, Hereford-square, S.W., 29th April.

IRON IN PORTLAND CEMENT.

SIR,—A few months ago there appeared in your journal an article and, subsequently, some correspondence on the above subject. I have only recently had an opportunity of seeing the article in question, and, therefore, could take no part in the correspondence at the time. As, however, the subject is one of much interest to me, and doubtless to many of your readers, and as I do not think it was quite exhausted, I venture to ask you to find room for this, in the hope that some others may be led to give the results of their experience in the matter.

It is evident from the analysis given in your article (Vol. XXXIX., p. 318) that the "metallic matter" extracted by the magnet contained only a very small proportion of free or metallic iron (·43 per cent), while 9·08 per cent. of it was found to be "oxide of iron."

The metallic iron present may have been, and most probably was, a result of the grinding process, as stated by the writer of the article in one of his subsequent letters; or it may possibly have been reduced from an oxide existing in the raw materials used for making the cement. In the presence of a suitable reducing agent, such as carbon or carbonic oxide, iron may be reduced from its oxide at a moderate red heat, considerably below the temperature existing in a cement kiln. Indeed, the oxide of iron stated to have been found in the matter extracted by the magnet may possibly be an indication that a partial reduction had taken place. It is not stated what oxide was found, but from the form and colour of the matter (p. 317) it was probably magnetic oxide. It would be interesting to know this definitely, as it would enable one to predict pretty accurately the subsequent behaviour of the oxide in the cement. If the writer of the article still has the notes of his analysis by him, he might enlighten us upon this point.

From whatever source the metallic iron may have come, it must be evident that its presence was purely accidental. It is highly improbable that any manufacturer or agent introducing it as an adulterant would limit it to an average of ·0009 per cent. of the cement.

Your article concludes with the statement that "the less iron in Portland cement the better; for its presence, whether chemically or mechanically, is productive of danger."

Free iron mechanically mixed with cement may be so, as on exposure it will oxidise and may cause disintegration—although it is worthy of note that the oxidation of the iron borings in the rust cement used by mechanics is not accompanied by disintegration; but, on the contrary, this cement offers a very remarkable resistance to atmospheric influences. However, assuming that it does tend to cause disintegration, if we take the cements experimented with as fair samples, the danger must be infinitesimal. For ordinary purposes, such as mortar or concrete-making, the cement is usually mixed with other materials in variable proportions. The metallic iron must, therefore, form an exceedingly small fraction of the whole; and as only a small proportion of it can be exposed to atmospheric influences, the oxidation and consequent disintegration of this portion cannot appreciably affect the mass.

The combined iron existing in the matter extracted by the magnet in the form of oxide of iron is shown by your analysis to amount to ·019 per cent. of the cement. It is more than probable that a full analysis of the cement would have shown a much larger proportion of iron oxides, as the magnet would only attract the minute particles of magnetic oxide, or those particles of ferric oxide to which particles of magnetic oxide might be attached. However, whatever the quantity of iron oxide might be, it would consist of one or other of these oxides, neither of which can be further oxidised under ordinary circumstances.

In support of his view of the danger consequent upon the presence of iron in cement, the writer of your article states (p. 428) that "the most durable building stones are those which have the smallest quantity of iron in their analysis," those "having oxide of iron in their paste or matrix being liable to premature disintegration," "the best stones being those which are purely silicious."

This latter statement is undoubtedly true; but the others are, to some extent, misleading. Of two or more given building stones, it is quite possible that the one which contains the *most* oxide of iron may have the best weathering qualities. Before forming any opinion on the merits of a stone containing oxide of iron, it is absolutely essential to know the exact nature of the oxide.

Reference is made to the stones used in the Cathedrals of Carlisle and Chester, and in Lincoln and York ministers; and the more rapid decay of the former is attributed to their having "a much larger percentage of oxide of iron in their composition than the latter." I have not an analysis of these stones by me, but I fear it would be somewhat difficult to prove that their failure is due wholly to the presence of oxide of iron. It is quite possible that local circumstances may have had something to do with it, and in comparing the results given by different stones, it is necessary to take these local circumstances into consideration. For instance, the Portland-stone selected for the Houses of Parliament was found on analysis to contain 0·5 per cent. of iron and alumina; the famous Craigleith sandstone is said by Henry Reid to contain 0·6 per cent. of iron and alumina. Would it be fair for me to institute a comparison between these two stones, and to make therefrom the deduction that the more iron and alumina a stone might contain, the better would be its weathering qualities?

I do not for a moment seek to maintain that the presence of iron in a building stone is desirable, or necessarily beneficial; but I protest against its being condemned as necessarily destructive. The sandstone above referred to is one of the best weathering stones in Britain, and it is noteworthy that it contains a larger proportion of iron and alumina than is given in your analysis of the "metallic matter" extracted by the magnet from the cements experimented upon. These cements would, however, contain a much larger proportion of alumina than that which was found in the metallic matter.

I might mention other sandstones, &c., distinctly ferruginous, which have been shown to have excellent weathering qualities—*e.g.*, the Crawlout sandstone in Linlithgowshire, which was used in the erection of a bridge, A.D. 140, and of the old church of Kinneil in the twelfth century. Henry Reid, in his "Practical Treatise on Concrete" (first edition) quotes two analyses of mortars from the neighbourhood of Cologne, 1800 years old, and each containing 2·75 per cent. of iron and alumina; one of mortar from the ruins of a temple near Larnaca, Cyprus, "supposed to be the oldest mortar in existence, containing 3·15 per cent. of iron and alumina." These, and a host of others, seem to show that iron in certain forms is not very actively destructive.

So far as my personal experience goes, I may add that during the past fifteen years, I have been in the habit of using large quantities of "mine dust" (containing about 30 per cent. of metallic iron in the form of magnetic and ferric oxides) for both mortar and concrete making. For the former I have used one part of lime to two parts of mine dust, without the admixture of any sand, and when properly wrought it gave excellent results. For concrete-making I have used hundreds of tons of it mixed in different proportions, and I never found it result in failure. I shall be glad to give particulars to any interested.—I am, &c., GARSC.

THE FIRE IN THE HAYMARKET.

SIR,—I have read in your impression of yesterday's date the interesting article on the fire at The Stores, in the Haymarket, on Saturday evening last, but am at a loss to understand how the cast-iron stanchions in the basement are rendered capable of bearing safely an accumulated load of 300 tons each.

Having worked out the safe loads of said lowermost stanchions from the figures given, viz., diameter, 18in.; thickness of metal, 2in.; and assuming the length to be 10ft. I find, adopting the following formula, $36 \div 1 + \frac{3L^2}{400D^2}$ = breaking weight in tons per square inch of sectional area of metal, L representing length in inches, and D, diameter in inches; that such a stanchion would safely carry 205 tons.

It would be interesting to know what conduces most to the enormous additional strength, whether it is an extra number of horizontal stiffeners that renders it so inordinately compressible.—I am, &c.,

ALFRED C. HURLEY.

4, Cumberland-terrace, Lloyd-square, W.C., April 30th.

MARIETTE BEY'S SUCCESSOR.

SIR,—I am quite sure that every one possessing any interest in Egyptology will rejoice at the appointment of Dr. Julius Oppert, the distinguished Assyriologist, as successor to the late learned and indefatigable Mariette Bey. What could be more fitting than that the author of such valuable and interesting accounts of the ancient Assyrians and Babylonians, and their long-lost cities should be selected to continue the exhumation of those hidden treasures and monuments of their greatest adversaries, the Egyptians, some thirty centuries ago?

The learned doctor, like his predecessor, is a French Academician, is fifty-six years of age, and will consequently bring to bear upon his labours a considerable amount of wisdom and experience, and is, I believe, already in Egypt. France has done much towards restoring to sight the remains of those once truly magnificent cities, and the priceless treasures that lay scattered by, covered for ages by burning sand, and the débris of ancient greatness. What, may I ask, has England done in this respect, with all its boast of wealth and its pride in its grand discoveries? Is it not a reproach to our country that we have yet done nothing? Perhaps, for its own greatness' sake, it would prefer that what remains of ancient Egypt should still *in occulto latent*. Again, I would ask, Does not a golden opportunity present itself of adding to the honours of our country by proffering Dr. Oppert some assistance in his intensely interesting work? thus joining hands with France in so commendable an enterprise, and adding the services of youth and energy to those of wisdom and experience. Such a coadjutator from England, I feel sure, would materially strengthen the hands of Dr. Oppert, and would prepare in due course for his successor, who has now given the remainder of his life to this great work. There is a great deal yet to be done; the interests of England and France in Egypt are identical, and I have often thought had the masterly stroke of Lord Beaconsfield, of purchasing so large a portion of the Suez Canal interest, been followed up by the appointment of an English Egyptologist, few actions would have more redounded to the honour of our country, or lived longer in the memory of the nation. Mercenary England, however, can purchase the Canal shares, but cannot afford to think of the relics of the greatness of that wonderful country, now almost buried in oblivion.

Mariette Bey laboured most zealously; indeed, he overworked himself. The matchless museum at Boulak, which I had the great privilege of visiting in November last, testifies to the enormous amount of work accomplished by him, and I do not think his successor could more fittingly inaugurate his appointment than by completing the new catalogue arrangements upon which, I believe, Mariette Bey spent some of his very last days. I can scarcely express with what delight I directed my donkey-boy for Boulak, not many hours after I had been in Cairo, prepared, as I thought, from the information I possessed, for a careful examination of the Museum; but my disappointment was great to find such a valuable and interesting a collection literally upside-down, so far as catalogue order was concerned, and with no one in possession to give the slightest information. Still, by dint of perseverance, I was enabled to discover a good deal. The thought, however, prevailed, "Here is the nectar within reach, but it must not be touched."—I am, &c.,

H. H. BRIDGMAN.

42, Poultry, E.C., London, May 2.

Among other important buildings to which Mr. Thomas Elsley's patent balance sash-lever has been successfully applied, are the New Natural History Museum at Brompton, the New Brompton Hospital, the new Temperance Hospital, London; the lantern-lights in the New University College, Gower-street, and the new buildings of the Scottish Corporation, Crane Court, Fleet-street.

Intercommunication.

QUESTIONS.

[6492.]—**Lightning Conductors.**—Can any reader oblige us with the name and address of a maker of scaling ladders for fixing lightning rods, &c., to chimneys and spires?—B AND F.

[6493.]—**Hoop-Iron Bond.**—I have been told by a builder that he has seen walls lifted by the oxidation of hoop-iron bond, the joints opening all round where it has been inserted. Has any one else seen this?—J. T.

[6494.]—**Painting Queen Anne Work.**—Will some of your readers kindly inform me of the most suitable colour for painting doors and frames and sashes and frames of a red brick public building in the Queen Anne style?—INQUIRER.

[6495.]—**Vegetation on Stone.**—What is the best thing to remove a thick coating of vegetation that has formed on the face of a tombstone, without injuring the surface and the lettering, the letters being V cut and painted black? The material is Pennant stone. Also, is there anything suitable for painting on the stone to prevent further vegetation forming, so that the natural colour of the stone will not be materially interfered with? The cause of the evil is constant drippings of rain from an overhanging tree. An answer to these questions will greatly oblige.—TOMMY T. SQUARE.

[6496.]—**Illustrations for Lectures.**—I am desirous of giving a few lectures of an elementary character on Gothic Architecture, and would like to make them interesting and profitable by means of graphic illustrations. I should, therefore, be glad to know where and at what cost I can procure sheets or charts containing a few typical plans, elevations, sections, and views, together with the details characteristic of the various periods. The scale must, of course, be sufficiently large to render the illustrations distinctly visible to an audience of moderate size.—SCOTCH CLERGYMAN.

[6497.]—**Brick Chimney-Shaft.**—Will you, through your valuable columns, inform me the best mode of lining a brick chimney shaft, 150ft. high, to a chemical and colour works?—ONE AT A LOSS.

[6498.]—**Cemeteries.**—Can any one give me a few examples of good cemeteries, recently built, with short description of arrangement? Have any good illustrations of cemeteries appeared in the BUILDING NEWS recently? I should be glad of dates, so as to facilitate search.—M.

[6499.]—**Quantity-Surveying.**—Will some experienced surveyor kindly tell me the best method of taking off the quantities of stone tracery? Most books ignore the point. Does Mr. Leaning's new book go into the matter?—TYRO.

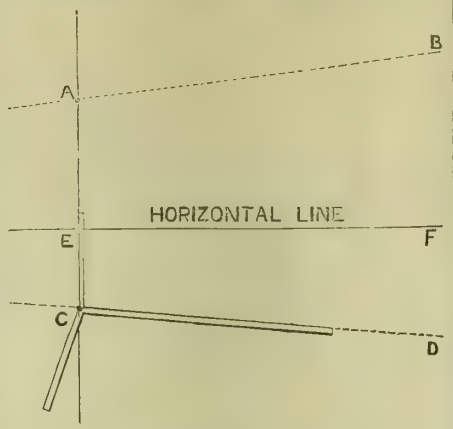
[6500.]—**Madame Patti's Estate.**—Can any one inform me what was the price given by Madame Adelina Patti for the estate she purchased in Wales, and over which there was lately some litigation?—T. G. ANDREWS, F.R.I.B.A.

REPLIES.

[6472.]—**Plain Tile Roofing.**—The square pitch is sufficient for all practical purposes, and is the pitch used at Lowther Lodge and Mr. Marcus Stone's house. Tiled roofs should be as elastic as possible, and to secure this result there is nothing equal to the old expedient of bedding them in hay. Nibs are better than nails, as the tile is less likely to be pinched; but for open sheds nails should be used, as the wind will lift nibbed tiles and cause them to get loose. The tiles at Lowther Lodge and Mr. Marcus Stone's house are bedded in mortar, and are not nailed The mottled effect that has been so much admired is produced by mixing the purple, dark red, and light red together, just as they would come from the kiln; the different degrees of hardness produce different kinds of vegetation, and so the green mosaic effect is caused. There is one objection to tiles bedded in mortar, and that is when the roof is quite new, if any rain penetrates the tiles, it is unable to escape at the laps and falls on the ceiling below. When the tiles have vegetated this ceases. With a roof pointed with lime and hair, or torched, as it is termed, this would not be so much an objection, as more water would find its way through; but with hay bedding this is altogether avoided, as the hay offers no impediment to its passage. The roof of a house is usually partly supported by the outer walls and partly by the internal partitions, consequently unequal settlements are unavoidable. The stiffer the tiling is the greater number of tiles are snapped by this strain, and the more spring they have the safer they are. The Broseley tiles are the best, the strawberry Broseley he most effective. There is a new Broseley tile called a machine-made pressed Broseley, which is a very true tile, and, although not so irregular in effect as the ordinary hand-made tile, is much tighter and more weatherproof. I have covered a roof with these tiles at an angle of 45° that stood the terrible 18th of January, and did not let in any snow. I covered another roof in the same town with the ordinary hand-made Broseley. This roof let in the snow, and a third piece of roofing, bedded in hay, kept the snow out perfectly. There is always plenty of ventilation under a tiled roof; no provision need be made for it. In a very exposed position I would lay nibbed tiles in hay, with felt and boarding underneath, and work to a 4in. gauge, with an angle of not less than 45°, and with these precautions I do not think your correspondent will have anything to fear. If very exposed indeed, use nails instead of nibs, or nails and nibs will be better, the nails smaller than the holes in the boards so as to give the tile play. If matchlining is used, and the rafters are planed, it can be painted on the underside, and no other ceiling will be necessary.—W. H. LASCELLES.

[6472.]—**Plain Tile Roofing.**—If "Gobo" will give a name and address where a sample tile can be sent him, one with nibs and peg-holes, and non-porous, shall be sent him in due course.—BRICK.

[6475.]—**Advantages of Centrolineads.**—The inquiry "how to set the centrolinead" is so frequently made in these columns that it may be useful to repeat an easy and accurate method which appeared in the BUILDING NEWS some ten or twelve years ago, and which is even simpler than "T. D.'s" rule of thumb. Find two lines, AB and CD, converging to the VP, one above and one



below the horizontal line. Draw a line AC, crossing these at any convenient angle. Set one arm and the ruling edge of the centrolinead to angle CAB, and the other to angle ACD (as shown), the pins being fixed at A and C. The points A and C need not be equidistant from the horizontal line EF, nor need the angles AEF and CEF be equal. The points A and C must be placed so that all vanishing lines (to this UP) on the picture pass between A and C.—JUVENIS.

[6475.]—**Advantages of Centrolineads.**—Hugh McLachlan has evidently never used a centrolinead, as there is no such thing as a right-handed centrolinead. One can be worked equally well on either side by reversing the arms.—W. M.

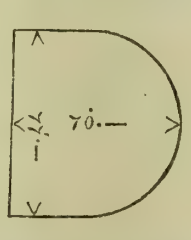
[6475.]—**Advantages of Centrolineads.**—"T. D.'s" "guess" mode is too much trouble. Tighten the screws, with arms more open as the point is more distant, lay the edge as in "T. D.'s" figure, and draw a pencil line on the board along the faces of the arms which will work on the pins. Then lay the edge to $x-y$ line, and if the arms cross the pencil lines, again draw similar lines in the new position, and fix each pin in the angle made so that each line is tangential to its rounded face. Then fire away. If one arm will cross the first pencil line, but the other will not, the arms are fixed too open, and must be more or less closed; or if both cross, but too near the ends of the arms to allow sufficient play for the scope of the picture, then also close them a little. "T. D." and Hugh McLachlan do not seem to be aware that every centrolinead works either right-hand or left-hand without reversing the arms. Occasionally two may be needed, and one will often serve for both, setting it as above by one edge for one hand, and by the other edge for the other hand. Once, on a large drawing, with the left-hand point 14ft. away, I found the arms too flat to work the right-hand also, but had to use a second instrument. This is very rarely the case.—E. C. T.

[6480.]—**Light and Air.**—The windows of the tenements having had uninterrupted view over the adjoining property over 20 years, the owner of property cannot obstruct or block out the light: the view is not recognised by the law. Of course, distance between the new premises and the windows would be a material consideration for a jury, but if the light is seriously diminished damages can be obtained. The question of the use made of the house so obstructed is also a material point in assessing damages. The law recognises no right to prospect except by agreement.—G. H. G.

[6482.]—**Building Construction.**—Tarn's "Science of Building," is a useful treatise for the student, and I can recommend it. It is published by Lockwood and Co.—G. H. G.

[6483.]—**Ancient Lights.**—Ancient lights means lights enjoyed as an easement for 20 years. C. may find find several recent decisions by looking over the "Legal Intelligence" in the last volume or two of the BUILDING NEWS.—G. H. G.

[6485.]—**Grand Hotel, Paris.**—In answer to the question by "E. J. R.," the dining-room at the Grand Hotel, Paris, is as sketch, on plan, length about 77ft. and



width 70ft.; height to flat part of ceiling above cove, 48ft. If "E. J. R." wishes any further information, I shall be happy to show him the lithographed designs, a copy of which was kindly given to me by the architect, Mons. Armand, some years since.—EDW. A. GRUNING, 9, Gresham House, E.C.

[6489.]—**Examinations in Building Line and Architecture.**—I wish to inform "Builder and Architect" that professions and trades are not as a rule combined, and before he may expect an answer to his query about examinations he had better state whether it is his intention to practise as an architect or as a builder. My advice to him would be to remain what he is, that is, a builder, and not to style himself what he is not, namely, an architect.—W. M.

PARLIAMENTARY NOTES.

SIR ROWLAND HILL.—On Wednesday the marble bust of the late Sir Rowland Hill, provided from the Memorial Fund now being raised at the Mansion-house, was unveiled, without ceremony, at Westminster Abbey. The bust has been executed by Mr. W. D. Keyworth, jun., and has been pronounced by the widow and family of Sir Rowland, and by those who knew the postal reformer, to be a most successful likeness. It is placed in the chapel of St. Paul, and bears the following inscription:—"Underneath is interred Sir Rowland Hill. Born December 3, 1795. Died August 27, 1879. Originator of the penny postal system."

LEGAL INTELLIGENCE.

QUANTITY SURVEYOR'S CHARGES.—EVANS AND ANOTHER v. D'OYLY CARTE.—This was an action brought before Mr. Justice Bowen and a common jury by Messrs. Evans and Deacon, quantity surveyors, against Mr. D'Oyly Carte, the proprietor of the new theatre building at the bottom of Beaufort-buildings, to recover the sum of £132 17s. 5d. for work done in reducing the estimates for building the theatre from £18,000 to £15,000. The defence was that the plaintiffs had been engaged to do the work in question by Mr. Walter Emden, the architect, after the defendant had withdrawn that gentleman's authority to act in his behalf. The jury found a verdict for the plaintiffs for the amount claimed.—On Wednesday, however, in the Queen's Bench division, a rule *nisi* was granted for a new trial by Lord Coleridge and Mr. Justice Field, the application being made on the ground that the verdict was against the weight of evidence.

STAINED GLASS.

KILDWICK, YORKSHIRE.—A series of five chancel stained-glass windows have just been erected by public subscription to the memory of the late vicar, the Rev. Herbert Todd, M.A., in the newly consecrated district church of St. Stephen, Steeton, a church which owes its origin to his exertions. The principal east window is of three lights, each divided into two compartments by a bordure, with appropriate text legends. Of these the upper and most prominent series is devoted to incidents in the personal life of Christ, the lower to responsive incidents in that of St. Stephen. Thus, above to spectator's left, the Lord miraculously multiplies the loaves and fishes to feed the multitude, whilst beneath St. Stephen presides, at the ministration of tables, his attendant deacon being a portraiture of the late vicar. In the right-hand light is Christ before Pilate, who washes his hands in protest, and, beneath, St. Stephen before the Council. The central light pourtrays, 1st, the Crucifixion, St. John, Mary Mother, and Mary Magdalene being immediately grouped at foot of the cross; and, beneath, the Martyrdom of Stephen in the presence of Saul. The chief tracery lights above are, centrally, a trefoil displaying a pelican and young and two quatrefoils, one on either side, below, with angels bearing a riband legend, "Surely He hath borne our griefs and carried our sorrows." The other four smaller windows are devoted to four of the Acts of Mercy, viz., giving meat to the hungry, drink to the thirsty, clothing the naked, and visiting the sick. The windows are from the art studio of Powell Bros., Park-square, Leeds, the treatment, in accordance with the architecture, being in the pure 14th Century style, the white or grisaille backgrounds giving additional effect to the subject, colouring, and ornamental enrichments.

WATER SUPPLY AND SANITARY MATTERS.

HARWICH.—The Board of Trade, as a result of the recent prolonged local inquiry, have made an order, authorising the maintenance and continuance of the water-works, the construction of additional waterworks, and the supply of water to Harwich and Dover-court. The capital is fixed at £20,000 and borrowing powers to the extent of £5,000 are granted. The works are to be commenced within three months after the passing of the Act confirming this order, and are to be completed within twelve months after the passing of the said Act, or such further period not exceeding twelve months as the Board of Trade may prescribe. The undertakers (Mr. P. S. Bruff, C.E., of Ipswich, or his assigns) are to provide a sufficient supply of pure and wholesome fresh water, and if they fail to do so, and if after an inquiry the Board of Trade are satisfied that they have failed, the Board may declare that the powers of this order shall cease. A penalty of £10 per day is to be imposed upon the undertakers for supplying water of less purity than specified on the order.

MONMOUTH.—The first sod of the two new filter-beds and three pure water tanks, by which the

intake of water supply from the river Wye will be increased, was cut on Tuesday week. The new works will impound 364,000 gallons additional, or three days' more supply of 20 gallons per head. The works are being carried out for the town council of Monmouth from the plans of Mr. T. Curley, C.E., of Broom-hill, Hereford, and under the personal supervision of Mr. Brace. For the work, exclusive of puddle, sluice-valves, and other materials, six tenders were received; the lowest, that of Mr. John Mackay, of Hereford, was accepted, at £1,461, and the work is to be completed by October 1st. The local representatives of the contractor are Messrs. T. Preece and Son.

CHIPS.

A new Baptist chapel was opened in John-street, Edmund-street, Camberwell, on Sunday last. It measures 44ft. by 26ft., and is 20ft. high to roof plate, and 29ft. from floor to apex of boarded ceiling. The lighting is by side windows and north skylight, the seating by chairs. Including a gallery at one end of building, over the two vestries, accommodation is provided for 300 persons. The building is of stock bricks, and all the woodwork is of stained pine. Mr. Alfred Bitt, of Dulwich, was the architect, and the late Mr. Richard Stevens, of Camberwell-road (and since his death his son) have been the builders.

On Monday week the piles which formed a dam to the entrance of Whitehaven wet-dock during the progress of alterations were forced away by the pressure of water. The accident will occasion considerable delay in the reopening of the dock, and appears to have been caused by the scouring of water beneath the concrete foundation of the invert through cracks in the masonry of the north pier. Mr. Brunlees is the engineer, and Messrs. Nelson Brothers are the contractors.

The Church of Christ, Above-bar, Southampton, was opened on Sunday week. It is Italian in style, and is 100ft. by 50ft., and 29ft. high, and seats 1,000 persons. There are galleries on three sides, and at one end of the building two platforms 1ft. 6in. and 3ft. high from the floor. At the rear are vestries and school-rooms. Mr. J. W. Rowland was the contractor.

The corporation of Dewsbury are about to carry out a further portion of the sewerage scheme, including about half-a-mile length of 12in. brick and concrete sewers. The work will be done from the plans and under the supervision of Mr. R. J. Duff, the borough engineer.

The council of the Hartley Institution, Southampton, last week adopted plans by Mr. James Lemon, C.E., of that town for alterations to the council chamber of the institution, including the erection of a permanent orchestra.

The town council of Plymouth on Wednesday received a report from the water committee, recommending the execution of the following works:—The construction of a storage reservoir on Rowborough Down of a minimum capacity of 20,000,000 gallons (about twenty days' supply), and the carrying of a main thence to the reservoir at Knackersknowle. The estimated cost of the works is £30,000, exclusive of purchase of land.

Memorial stones of a new Wesleyan chapel were laid at Gotham, near Nottingham, on Monday. The building is Venetian Gothic in style with open-timbered roof, and will seat 300 persons. Mr. R. C. Sutton is the architect, and Messrs. Haywood and Cumberland are the contractors.

At a vestry meeting held in the school-church of All Saints, Norwich-road, Ipswich, on Thursday week, it was decided to take steps for erecting a permanent church at a cost of about £4,500 for the first section, to seat 450 persons, and a committee was empowered to obtain plans and estimates for the work.

The St. Stephen's Art Society intends to open a new exhibition in May. It will be held in a large room facing Westminster Hall. The subscribing members (250 in number) will occasionally change their pictures, and will exhibit portfolios of sketches. On the committee are Viscount Bury, Mr. H. S. Marks, R.A., Mr. Frank Dillon, Mr. Claude Calthorp, Sir Herbert Maxwell, M.P., Mr. G. A. Sala, Mr. E. W. Godwin, Sir William Drake, and Mr. Walter Severn.

A bronze medal and a certificate has been awarded to Mr. Chas. Forster Hayward, F.S.A., of 20, Montague-street, Russell-square, London, for architectural designs, exhibited at the Sydney International Exhibition, 1879, and highly commended.

The business premises of Messrs. M'Swiney and Co., Lower Sackville-street, Dublin, have just been remodelled and extended, from the designs of Mr. William Hague, of that city. A new warehouse, with 77ft. frontage and six stories in height, has been added to the buildings. Mr. Joseph Kelly, of Thompson-street, Dublin, was the contractor.

Our Office Table.

It is proposed to hold a fine-art and industrial exhibition in the Drill Hall, Cardiff, during August and September next. A special feature will be made of pictures, paintings, sketches, and etchings relating to South Wales and Monmouthshire, and another interesting section will be a collection of the old Swansea and Nantgarw porcelain. The exhibition will be divided into three sections:—1, paintings and fine art; 2, statuary, porcelain and curiosities; and 3, machinery. For the lighting of the hall, the Siemens, Brush, Gramme and Jablochkoff systems of electric lighting are proposed to be placed in competition, and a series of concerts and entertainments will be given during the time the exhibition is open. Any profits are to be devoted to the artistic furnishing and decoration of the Free Library, Museum, and School of Science, now being erected from the designs of Messrs. James, Seward, and Thomas, for the Cardiff Corporation.

The preparations for the Exhibition of Works of Art applied to Furniture, at the Royal Albert Hall, are now being proceeded with. The available space has been divided amongst the following firms, who will afford facilities to exhibitors of articles which may be considered as accessories of furniture, such articles to be shown in company with the specimens of art-furniture exhibited:—Messrs. J. G. Crace and Son; Morant, Boyd, and Blanford; Jackson and Graham; Gillow and Co.; Holland and Sons; Howard and Sons; Wright and Mansfield; Collinson and Lock; Gregory and Co; Shoolbred and Co.; and Johnstone, Jeanes, and Co. The Exhibition will open on Thursday, 12th May, at the same time as the General Art Exhibition at the Albert Hall, and it is proposed to keep the Exhibition open until the end of July.

Messrs. M. J. & S. H. Adams, civil and sanitary engineers, Albion-street, Leeds, have designed a form of ventilator which combines, in an effectual way, a ventilator with a lamp-hole. It is called the "Pneumatic Sewer Ventilator," and the peculiarity of its construction is that the gases are thoroughly diluted with fresh air, previous to their escape, and are thus rendered harmless. By the constant suction to the outlet, and the arrangement of the inlet channel, the foul and fresh air are made to mingle and travel round together before being discharged through the grated cover. The construction is perfectly simple, and the ventilator, we find, is made in a circular and square form. The same firm has patented an improved "quick-charging siphon" for the self-flushing of house-drains and sewers, which, from its quick and intermittent action, promises to become useful as a flushing apparatus, or for purposes of intermittent filtration. The principle of its construction is extremely simple, and it can be easily fitted to tanks, masonry, or brickwork for the flushing of sewers. As the liquid rises in the tank, the air in the siphon becomes compressed to such a density as to resist the liquid flowing through until the ball-valve comes into operation and allows the compressed air to escape. When this takes place the liquid, of course, is admitted into the siphon, and an immediate discharge of the contents of the tank follows. The advantages claimed by the patentees are its instantaneous and certain action, its economy, as no liquid is wasted in the charging; its compactness of form, and its cheapness. The siphons are made both in cast-iron and fireclay.

During the spring rains in Georgia the Coosa River overflowed its banks, and in one place washed the soil from a considerable area. After the water subsided the washed land was found to be an ancient battlefield and burying-ground. Part of the territory consisted of mounds, evidently fortifications. These were strewn with implements of aboriginal warefare, beads, and earthen vessels. The remainder of the ground was covered thickly with skeletons, all perfectly exposed, and all in good preservation. A Press despatch from Rome, Ga., dated April 2, says the place is attracting crowds from all directions, and it is almost impossible to prevent vandalism from seriously impairing what will prove to archæology one of the richest finds ever made on the American continent. Among the countless number of Indian pipes found is one of great size and exceedingly fine workmanship, the bowl of which is carved with great skill into the form of a human head.

The classes in Technical Education held at the Cowper-street Schools, which, pending the erection of the Finsbury College, are rented by the City and Guilds Institute, commenced on May 2, and are open to all who like to attend on payment of a nominal fee. The fee in fact is so small compared to the advantages offered, that it can only be regarded as a test that the student is in earnest, and does not attend the classes out of idle curiosity. The classes, it should be pointed out, are open to female as well as male students, and there can be no question that many women unable to obtain similar information elsewhere might attend the day courses with advantage. A summary of the lectures to be given and the classes to be held, syllabuses, and every information can be had on application to Mr. Philip Magnus, the director and secretary, at Gresham College, E.C.

The gas and water committee of the Corporation of London recently undertook to ascertain the cause of the great increase in the gas-bills of private consumers, and Mr. C. Heisch, the gas examiner to the Corporation, has accordingly reported to them. The pressure has been increased in accordance with public demand since the new mains to Beckton were completed, but the fittings of the consumers remain as they were, and consequently gas is blown to waste. Mr. Heisch recommends consumers to see that their fittings are of proper dimensions and sound, and then to control the supply by the tap on the meter; the carelessness of servants can be met by the use of "governors." The Corporation committee have agreed with his report, and "action, Parliamentary or otherwise," is postponed.

On Friday last, a very numerous gathering took place in the galleries at 9, Conduit-street, on the occasion of the Architectural Association Members' Soirée, the chair being taken at the opening of the meeting by Mr. E. C. Lee, the President. The proceedings were entirely of a social character, and several good songs were sung by members or their musical friends. A facetious programme was circulated among the company, and was printed in imitation of our own pages under the title of "The British Builder and Architectuading News," edited of course by the Secretary of the Entertainments Committee, Mr. H. D. Appleton, assisted by Mr. H. H. Stannus. Some of the jokes in this production are not very creditable to their authors or the editorship which admitted them. It is not necessary to be nasty to be funny, nor does profanity add to pungency; and it might be desirable to remember on another occasion that young gentlemen who possess a love for the beautiful may also be decent. Among the impromptu speakers were Prof. Kerr, Messrs. R. P. Spiers, E. J. Tarver, R. E. Pownall, T. Blashill, Chas. Forster Hayward, and others. The rooms were hung with paintings belonging to the Institute of Art, and a large collection of very admirable sketches by Mr. L. A. S. Stokes, made as Pugin travelling student, were exhibited. Some good photographs of old London were also shown, and some fine specimens of ceramic ware, the property of Mr. Wasserburger, of Snow-hill, attracted attention.

A Bill which Mr. Chamberlain has introduced for confirming several provisional orders made by the Board of Trade under the General Pier and Harbour Act of 1861 relates to 13 places. Under these orders piers are authorised to be constructed at Folkestone, Ramsgate, Shanklin, and Weymouth, and at Lochaline, in Argyleshire. At Folkestone the new pier is to be opposite Cheriton-place; at Ramsgate it is to run from the West Cliff, near the boundary-stone between Ramsgate and St. Lawrence; at Shanklin, from a point between the Coastguard watchouse and Shanklin Chine; and at Weymouth, opposite the Burden Hotel. One of the orders confers further powers on the Weston-super-Mare Pier Company. Another provides for the maintenance and regulation of Crarae pier, on Loch Fyne. One of the orders makes some new provisions with respect to the harbour of Paisley and the navigation of the river Cart. Others provide for the improvement and regulation of Girvan harbour in Argyleshire, and of Stornoway Harbour.

Others alter the rates levied in the harbours of Whitby and Pittenweem, and another revives and amends some of the powers conferred by the Leven Harbour Act of 1876.

The summer exhibition of the Yorkshire Fine Art and Industrial Institution was formally opened yesterday at York, by Sir Bartle Frere. The picture galleries are full of capital examples of the modern masters, whilst of the ancient school the works belonging to Lord Feversham hold a prominent position amongst a large number of others. The Royal Indian treasures, contributed by the Prince of Wales, put all the other objects into the shade. Precious metals worked up into infinite variety of form, and decked with precious stones, form a most lavish display; whilst there are numerous articles which illustrate Indian manufactures in a variety of phases. In a hand-book which has been prepared by Dr. George Birdwood, C.S.I., for the occasion of the exhibition at York, he says that independently of the industrial and artistic value of the presents, many of them are of the highest political significance, having been family or national heirlooms, which nothing but a sentiment of the sincerest and most devoted loyalty could have tempted their possessors to give up. The special industrial value of the collection arises from the fact that it is thoroughly representative.

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I find it necessary to warn my Customers that my only Address is as above, and that I have no connection with any house assuming a similar Name.

FREDERICK ARTHUR,
DECORATOR TO HER MAJESTY.

CHIPS.

The Bermondsey Vestry on Monday week received a report from the finance committee with reference to an account from Messrs. Eldridge and Gee for alterations at Neckinger-house, the residence of the clerk of works to the vestry, amounting to £382 7s. 2d. The contract was taken at £221, so that the extras amounted to £161 7s. 2d., and the committee did not feel authorised to recommend the account for payment. Mr. Elkington, surveyor to the vestry, stated that he had given an order for some of the extras, but that between £40 and £50 represented articles he had not authorised. Severe comments were made on the action of the official concerned, and the account was ordered to stand over, the details to be brought before the committee.

Large premises in Southgate-street, Gloucester, have just been rebuilt and extended for a furnishing contractor and depositor. The building now consists of five fireproof floors of four rooms each, the 20 showrooms being each 70ft. by 23ft. wide. Mr. J. P. Moore was the architect, and Mr. Joseph Meredith, also of Gloucester, the contractor.

A new system of tramways in Grimsby was inspected last week by Major-general Hutchison, of the Board of Trade, who refused to pass it, as the granite setts outside the rails, instead of being alternately 21 inches and 15 inches in length, are uniformly dressed to 18in. The alterations will cost, it is said, £600. The work has been carried out from the plans of Mr. Emanuel, engineer to the company, by Messrs. Riggott and Hewins, contractors, under the supervision of Mr. Maughan, borough surveyor, and a committee of the town council.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.
The ANNUAL GENERAL MEETING of Members only will be held on MONDAY, the 9th inst., when the President will take the chair at 8 p.m. precisely. Fellows are recommended to bring with them both the Report of the Council and the Balloting Paper for the Annual Election, as only a very few copies of either will be available on the night of the Meeting. Fellows are also reminded that they must be present at the Annual Meeting in order to record their Votes.
GENERAL CONFERENCE, 1881.—Gentlemen attending the Conference must be provided with special cards to enable them to VISIT the PICTURE GALLERY of Buckingham Palace. Application for these cards must be made before SATURDAY, 7th inst., to Mr. COLE A. ADAMS, 14, Holden-terrace, Grosvenor-gardens, S.W.
J. MACVICAR ANDERSON, Hon. Sec.
WILLIAM H. WHITE, Secretary.
Conduit-street, Hanover-square, London, W.

MEETINGS FOR THE ENSUING WEEK.

Saturday (to-morrow.)—Conference of Architects; Reading of paper on "Quantities." 11 a.m.
Architectural Association. Visit to W. H. Lascelles' works, Bunhill-row. 3 p.m.
Royal Institute of British Architects. Annual Dinner at Freemasons' Tavern. 7 for 7.30 p.m.

Monday.—Conference of Architects. Visit to picture-gallery of Buckingham Palace. 11 a.m. Visits to St. Etheldreda's, Ely-place, Holborn; thence to St. Bartholomew's-the-Great, West Smithfield; and St. Giles's, Cripplegate. 3 p.m.
Royal Institute of British Architects. Annual general meeting of members only. 8 p.m.
Society of Arts. Cantor Lecture No. IV. "The Art of Lace-Making." By Alan S. Cole. 8 p.m.
Royal Institution. General monthly meeting. 9 p.m.

Tuesday.—Conference of Architects. Third meeting. Discussion on "Quantities." 11 a.m. Fourth meeting. Discussion on "Architectural Competitions." Opened by the Chairman, Chas. Barry, Past-President. 3 p.m. Fifth meeting. Discussion on "Architectural Competitions." 8 p.m.
Society of Arts. "Trade Relations between Great Britain and her Dependencies." By W. Westgarth. 8 p.m.
Institution of Civil Engineers. "Torpedo Boats and Light Yachts for High Speed Steam Navigation." By J. I. Thornycroft. 8 p.m.

Wednesday.—Conference of Architects. Visits to Royal Courts of Justice, 11 a.m.; to residence of Sir F. Leighton, P.R.A., 2, Holland-park road, W., 3 p.m.; to New Hospital for Consumption, Brompton, 5 p.m. Conversazione at Institute Rooms. 9 p.m.
Society of Arts. "The Manufacture of Glass for Decorative Purposes." By H. J. Powell (Whitefriars Glass Works). 8 p.m.

Thursday.—Conference of Architects. Visits to Doulton and Co.'s Lambeth Potteries, 11 a.m., and to Hertford House, Manchester-square, 3 p.m. Sixth meeting. Papers on "Mural Painting and the Gambier Parry Process." By Ford Madox Brown; and "The Coloured Decoration of Public and Private Buildings." By J. D. Crace. 8 p.m.
St. Paul's Ecclesiological Society. "The Christian Antiquities of Constantinople." By E. Freshfield, F.S.A. 8 p.m.
Society of Arts. "Recent Progress in the Manufacture and Applications of Steel," By Prof. A. K. Huntingdon. 8 p.m.
Society for the Fine Arts. "Art Exhibitions." By Dr. J. S. Phené, F.S.A. 8 p.m.

Friday.—University College. "The Sepulchres of the Greeks and Romans." By Prof. C. T. Newton, C.B. 4 p.m.
Architectural Association. "Light and Air." By R. E. Pownall. 7.30 p.m.
Society of Arts. "Burmah." By Gen. Sir A. Phayre, G.C.M.G. 8 p.m.
Royal Institution. "Mental Images and Vision." By F. Galton. 9 p.m.

Saturday.—St. Paul's Ecclesiological Society. Visit to St. Helen's, Bishopsgate, and paper by G. H. Birch, A.R.I.B.A. 3 p.m.

Lamplough's Pyretic Saline is refreshing, most agreeable, and the preventive of FEVERS, BILIOUSNESS, SMALL POX, SKIN DISEASES, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill. *Use no substitute* —[Advt.]

Holloway's Pills. These famous Pills purify the blood, and act most soothingly on the liver, stomach, bowels, and kidneys—the great main-springs of life. They are wonderfully efficacious in all ailments incidental to females. To the emigrant, traveller, soldier, and sailor they will be found invaluable in the time of need.

Trade News.

WAGES MOVEMENTS.

Oldham.—The painters of this town struck on Monday, owing to the refusal of the employers to accede to their demand for an increase of wages of ½d. per hour.

Doulting Freestone and Ham Hill Stone of best quality. Prices, delivered at any part of the United Kingdom, given on application to
CHARLES TRASK,
Norton-sub-Hamdon, Ilminster, Somerset.
—[Advt.]

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CORSHAM DOWN
CANNOT BE SURPASSED IN BEAUTY OF APPEARANCE FOR INTERIOR WORK.
PICTOR & SONS, BOX, WILTS.
(See trade advt. on p. XXV.) [Advt.]

TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender—it adds to the value of the information.

Addiscombe-road.—For Wesleyan chapel and schools, Addiscombe-road. Mr. F. Boreham, architect:—

Higgs and Hill	£6,550 0 0
Goodman	6,415 0 0
Ward	6,061 0 0
Sargeant	5,748 0 0
Bowyer	5,744 0 0
Smith and Son	5,587 0 0
Belham and Co.	5,450 4 0
Morter	5,403 0 0
Steel Bros.	5,390 0 0
Woodward	5,366 0 0
Marriage	5,250 0 0
Sawyer	5,231 0 0

Bethnal Green.—For rebuilding the Rose public-house, West-street, Bethnal Green, for Messrs. Smith, Garrett and Co. Messrs. Hammack and Lambert, architects:—

Smith, T. W. and Son	£1,189 0 0
Cocks, J. and H.	1,118 0 0
Johnson, J. H.	993 0 0
Cubitt, W. R.	895 0 0

Bethnal Green.—For alterations and additions to shop, No. 123, Brick-lane, for Mr. P. Griggs. Mr. A. Stanton Cook, 14, Furnival's Inn, E.C., architect:—

Wire, B., Bethnal Green (accepted)	£318 11 6

Canning Town, E.—For the erection of timber fence, across Crawford-street, for the West Ham local board:—

Norton and Son	£75 0 0
Gentry, M.	68 10 0
Smith and Son	68 0 0
Horlock	63 0 0
Shaw	52 0 0
Corderoy	46 15 0
Holloway (accepted)	44 15 0

Crouch Hill.—For erecting a Wesleyan Methodist Chapel at Holly Park, Crouch Hill, N. Contracts Nos. 1, 2, 3, and 4. Mr. E. Hoole, architect:—

		Extra for stone facing.
Sharman	£15,100 0 0	Nil.
Yardley and Sons	12,285 0 0	£388 0 0
Higgs	11,300 0 0	550 0 0
Burman	9,960 0 0	1,600 0 0
Smith, W.	9,660 0 0	1,364 0 0
Crabb	7,764 0 0	584 0 0
Holloway	7,249 0 0	1,390 0 0
Lathey Bros. (accepted)	7,033 0 0	331 0 0

Deal.—For the supply of 1,000 tons of flints, for the town council:—

Foster (accepted)	£250 0 0

Devon.—For the erection of residence at Kingswear, for Mr. N. Baker. Mr. R. Medley Fulford, A.R.I.B.A., Exeter, architect. Quantities by Mr. E. Crutchloe, 3a, Poets' Corner, S.W., surveyor:—

Luscombe and Son, Exeter	£4,075 0 0
Mathews, F., Babbacombe	3,900 0 0
Stephens and Bastow, Bristol	3,864 0 0
Pillar, L. C., Dartmouth	3,840 0 0
Gibbard, Exeter	3,620 0 0
Ebdon, Exmouth	3,499 0 0
Oldrieve, Dartmouth	3,458 0 0
Foaden, Ashburton	3,430 0 0
Rouse, Torquay	3,210 0 0
Tapper, Bovey (accepted)	3,066 0 0

Doncaster.—For heating apparatus, Priory-place Chapel, Doncaster. Messrs. Parry and Walker, architects. Quantities by architects:—

Beaumont and Dougill, Leeds	£295 8 0
Longbottom, C., Doncaster	260 0 0
Goddard and Massey, Nottingham	248 16 0
Bolton, J. H., Halifax	225 0 0
Lampen and Theedem, Wakefield	219 0 0
Rayner, J. W., Thorne	215 0 0
Holden, R. W., Sheffield	214 0 0
Grossley, G. and Son, Doncaster	212 2 6
Messenger and Co., Loughborough	210 0 0
Newton and Chambers, Thornclife	205 0 0
Farr, R., Doncaster	204 18 0
Truswell, W., Sheffield	204 10 0
Galli and Co., Leeds	199 10 0
Nelson, J. and Sons, Leeds	199 10 0
Heaps and Robinson, Leeds	195 0 0
Crabtree, Bros., Leeds	190 6 11
Taylor and Parsons, Bradford*	173 10 0

*Accepted.

Doncaster.—For repewing and alterations to Priory-place Wesleyan Chapel, Doncaster. Messrs. Parry and Walker, Nottingham and Doncaster, architects. Quantities by the architect:—

Johnson, W., Doncaster	£2,395 0 0
Mason, W. and Sons, Leeds	2,231 14 7
Athrow Bros. and Gill, Doncaster	2,187 0 0
Meggitt, Thorne	2,098 16 0
Arnold, H., Doncaster	1,997 0 0
Anelay, W., Doncaster	1,990 0 0
Illingworth Bros., Bradford	1,880 0 0
Chadwick and Co., Rotherham*	1,687 0 0

*Accepted.

Durham County.—For the erection of board schools at Felling, for the Heworth school board:—

Waddle, G., Edinburgh (accepted)	£3,460 18 0

East Ham.—For new roads and surface-water drains on the East Ham estate, Essex, for Mr. W. Hitchman:—

Dunmore	£1,235 0 0
McKenzie	1,190 0 0
Wilson	1,020 0 0
Harris	958 0 0
Peill	710 0 0
Jackson (accepted)	666 0 0

Forest Gate.—For Wesleyan chapel and offices, Forest Gate. Mr. F. Boreham, architect:—

Goodman, W.	£5,995 0 0
Dove Bros.	5,570 0 0
North Bros.	5,490 0 0
Nightingale	5,454 0 0
Roberts, L. and R.	5,341 0 0
Hosking, G.	5,047 0 0
Bangs and Co.	4,997 0 0
Reed	4,985 0 0
Hearle and Son	4,983 0 0
Sargeant	4,890 0 0
Morter	4,873 0 0
Sawyer	4,720 0 0
Gregar (accepted)	4,584 0 0

Guildford.—For new shop-front, 31, North-street, Guildford. Messrs. Peak, Lunn, and Peak, Guildford, architects:—

Downes, T. E., Guildford	£39 10 0
Burdett, W. and Son, Guildford*	26 13 9
Swayne, T., Guildford	24 10 0

*Accepted.

Guildford.—For new mahogany shop sash and plate-glass at 151, High-street, Guildford. Messrs. Peak, Lunn, and Peak, Guildford, architects:—

Strudwick, G. (accepted)	£21 5 0

Guildford. — For constructing a new double shop-front, &c., at 162, High-street, Guildford. Messrs. Peak, Lunn, and Peak, Guildford, architects:—

Thompson, W., London	£133 16 0
Pearce and Clark, Guildford	98 0 0
Strudwick, G., Guildford (accepted)	89 5 0
Swayne, T., Guildford (declined)	65 10 0

Hemel Hempstead, Herts.—For the erection of dwelling house, baker's shop and oven. Mr. W. T. Feldon, Hemel Hempstead, architect:—

Horn	£435 0 0
Monk	390 0 0
Sear, Picotts End, Hemel Hempstead (accepted)	300 0 0
Philbey	292 0 0

Hull.—For the erection of Saint Philip's Church, Hull. Messrs. Botterill, Son and Bilson, architects. Quantities by the architects:—

Jackson, G., and Son, Hull	£4,468 16 9
Wilson Bros., Hull	4,200 0 0
Goates, T., Hull	4,076 0 0
Jackson, J., York	4,025 0 0
Dawes, J., Hull	3 937 4 0
Musgrave, B., Junr., Hull	3,926 0 0
Habbershaw, R. and Son, Hull	3,918 12 0
Lison, W., Hull	3,890 0 0
Padbury, J. and Son, Scarborough	3,888 17 0
Beevers, R., Hull	3,831 14 0
Curtis, J. and C., Hull	3,694 18 0
Hockney and Liggins, Hull	3,689 0 0
Sergeant, R., Hull (accepted)	3,602 0 0
Giles, T. E., Hull	3,595 0 0

Ilford, Essex.—For the erection of two pairs of houses, at Cranbrook Park. Mr. A. Stanton Cook, 14, Furnival's Inn, E.C., architect:—
Godbold, E. J., Ilford (accepted).

Kennington.—For repainting and repairing to The Duke of Cambridge, Upper Kennington-lane, for Mr. Edwards. Mr. H. I. Newton, 27, Great George-street, Westminster, architect:—

Young and Co.	£78 11 0
Godden	78 5 0
Gill	68 0 0
Cade	67 10 0
Pickersgill (accepted)	65 0 0

London.—For new warehouse, corner of New Basinghall-street and Fore-street, London, for Messrs. McIntyre, Hogg and Co. Mr. G. Somers Clark, architect. Quantities supplied by Mr. C. Mayland:—

Hayward Bros.	£15,790 0 0
Stephens and Bastow, Bristol	14,990 0 0
Mantey	14,895 0 0
Holland and Hannen	14,768 0 0
Lucas Bros.	14,463 0 0
Brass, W.	13,973 0 0

London.—For works to Nos. 2 and 3, Fisher-street, Red Lion-square. Mr. Charles Henry Searle, architect:—

	Repairs.	Extra for re-slating.
Broad and Son	£180 0 0	£10 0 0
Brown, G.	176 0 0	11 0 0
Scurrah (accepted)	155 9 0	4 10 0

London.—For the erection of a new story upon Crown-buildings, Queen Victoria-street, E.C., for Mr. G. Taylor. Mr. Alfred Burr, 10, Queen-square, W.C., architect:—

Richardson Bros.	£598 0 0
Horlock, Forest Hill (accepted)	565 0 0

London.—For alterations to the casual wards at Thavies-inn, for the City of London poor law guardians:—

Warner, C.	£132 15 0
Cox, H.	97 0 0
Bennett and Fraser (accepted)	89 10 0

Malvern.—For the erection of a water-tank on the Wells-road, for the local board:—

Osborne	£197 10 0
Inwood (accepted)	140 0 0

Monmouth.—For the extension of the waterworks. Mr. T. Curley, of Hereford, engineer:—

Thomas, Thomas and Son	£1,590 0 0
Davies, T. J., Neath	1,560 0 0
Krauss, A., Bristol	1,525 0 0
Morgan, C., Mayhill	1,518 0 0
Chapman, P., Pontypool	1,503 0 0
Mackay, J., Hereford (accepted)	1,461 0 0

Oldham.—For erection of warehouse, Oldham, for Mr. R. Sykes, iron merchant. Mr. Gregory Gill, Gillmoor, Stalybridge, and Booth-street Chambers, Ashton-under-Lyne, architect and surveyor:—

Jackson and Randall, Oldham	£1,022 0 0
Crowther Bros., Oldham	936 0 0
France, H., Stalybridge	905 0 0
Ashton, S. and Sons, Oldham	899 0 0
Dodd, W., Oldham	896 0 0
Storrs, W., Sons & Co. (Limited) Stalybridge	895 0 0
Booth, J., Oldham	889 0 0
Castle Hall Saw Mills Co	866 0 0
Dyson, J. and Sons	856 0 0
Schofield, C. and Co., Oldham*	855 0 0
The Cabinet Co., Oldham	818 0 0

*Accepted.

Penzance. — For the repair of the promenade in granite, for the town council. Mr. Small, borough surveyor:—

Freeman and Co. (accepted)	£1,033 0 0

Petersham, near Richmond, Surrey. — Accepted tenders for labour only in erecting a block of cottages for Mr. Robert White. Mr. William George Flint, architect:—
For excavating, bricklaying, slating, and plastering:—
King, G., Romford £240 0 0
For fixing carpentry, joinery, painting, glazing, &c.:—
Denman and Hughes, Petersham £200 0 0
For all the carpentry and joinery throughout the work:—
Stewart, A., Dundee £450 0 0

Ramsgate.—For painting the public seats and fences, for the town council:—

Mitchell	£116 0 0
Olby (accepted)	75 0 0

Romford.—For business premises in High-street, Romford, Essex, for Mr. J. W. Lasham. Mr. Robert Griggs, architect:—

Davey, Romford	£2,675 0 0
Holliday	2,575 0 0
Morter	2,500 0 0
Crockett	2,492 0 0
Hammond, Romford (accepted)	2,315 0 0
Larter and Son	2,331 0 0

Setmusthy, Cumberland.—For erecting a villa residence at The Cragg, Setmusthy, for Mrs. Fisher. Mr. W. C. Jennings, Cockermouth, architect. Accepted tenders:—
Mason, &c.:—Borrowscale, J., Cockermouth.
Joiner:—Robinson, P., Cockermouth.
Slater:—Armstrong, T., Cockermouth.
Plumbing and smith's Work:—Fisher, H., Cockermouth.
Plasterer:—Burges and Son, Cockermouth.
Painting and glazing:—Boyd, J., Cockermouth.
Total cost, £773 16s. 6d.

Southampton.—For the erection of a school in the St. Denys district:—

Chapman, W. H.	£5,168 0 0
Rowland and Martin	4,921 4 0
Dyer, J.	4,750 0 0
Jones and Co., Gloucester	4,680 0 0
Brinton and Bone	4,560 0 0
Stevens, R. and Son	4,539 0 0
Bailey, J.	4,500 0 0
Rowland, J. W.	4,495 0 0
Crook, J.	4,479 0 0
Bull, J. and Sons, Southampton*	4,376 0 0

*Accepted.

South Kensington. — For the completion of three mansions, South Kensington, S.W. Mr. A. R. Pite, 44, Bloomsbury-square, W.C., architect. Quantities by Mr. Rookwood:—

Booth and Sons	£14,659 0 0
Higgs and Hill	13,584 0 0
Staines and Son	13,382 0 0
Hobson	12,964 0 0
Falkner	12,950 0 0
Cowland Bros.	12,848 0 0
Nightingale	12 582 0 0
Braid and Co.	12,250 0 0
Kirk and Randall	12,215 0 0
Tongue	11,996 0 0
Patman and Fotheringham	11,973 0 0

South Petherton.—For building new Congregational schools:—
Staple and Stoke, Somerset (accepted).

Strand.—For alterations to premises, Northumberland-street, for Mr. Duncan Irvine. Mr. W. C. Evans, 3a, Poets' Corner, S.W., architect:—

Mallett, H.	£405 0 0
Gregory, T. (accepted)	355 0 0

Sydenham.—For new schools at Sydenham-road, Croydon, for the Croydon School Board, to accommodate 730 children, with caretaker's house, fences, playground, &c. Mr. Charles Bell, F.R.I.B.A., Dashwood House, 9, New Broad-street, E.C., architect. Quantities by Mr. Henry Lovegrove, 26, Budge-row, E.C.:—

Ward	£6,759 0 0
Marriage	6,705 0 0
Bowyer	6,388 0 0
Legg	6,253 0 0
Taylor	6,184 0 0
Williams, G.	6,110 0 0
Pearson and Myles	5,998 0 0
Woodward	5,926 0 0
Smith, J. and Son (accepted)	5,906 0 0
Higgs, F.	5,652 0 0

Thaxted, Essex.—For the repair of Park-street Baptist Chapel:—

Davies, W.	£34 12 6
Grout, G.	25 0 0
Ratcliff, O. E. (accepted)	17 15 0

Walton-on-the-Naze.—For repairing the breach in the sea-wall opposite the Albion Hotel, for the improvement commissioners. Mr. Harvey, town surveyor:—
Saunders and Son, Dedham (accepted) £900 0 0

Wandsworth.—For the fitting up of the premises now known as Fairfield Coffee Tavern, as a coffee tavern and club-rooms, for the United Kingdom Coffee Taverns Co. (Limited). Mr. Alfred Burr, 10, Queen-square, W.C., architect:—

Richardson Bros.	£293 0 0
Thomas	293 10 0
Smith, W. H., Walham Green*	252 16 0

*Accepted.

Willesden.—For Wesleyan Chapel, Willesden, Middlesex, for 1,000 persons, with spire. Mr. Charles Bell, F.R.I.B.A., Dashwood House, 9, New Broad-street, E.C., architect. Quantities by Mr. H. Lovegrove, 26, Budge-row, E.C.:—

Lucas and Son	£5,610 0 0
Johnson	5,454 0 0
Boden	5,370 0 0
White	5,340 0 0
Woodward	5,272 0 0
Tennant	5,117 0 0
Hickinbotham	5,100 0 0
Gregar	5,093 0 0
Belham	5,041 0 0
Higgs, F.	5,030 0 0
Allen and Sons (accepted)	4,700 0 0
Architect's Estimate	5,300 0 0

Woking. — For a pair of cottages, Maybury-road, Woking Station. Messrs. Peak, Lunn, and Peak, Guildford, architects:—

Gale, A. A., Woking	£593 0 0
Clark, J., Esher	555 0 0
Wilson, J., Woking	545 0 0
Shears, G., Woking	520 0 0
Butt, W. J., Woking	415 0 0
Whitburn, J., Woking	396 0 0
Swayne, T., Guildford	390 0 0
Fowler, S., Woking (accepted)	393 10 0

Woking.—For constructing new shops to four houses, Woking Station. Messrs. Peak, Lunn, and Peak, Guildford, architects:—

		Extra for tile wall lining to butcher's shop.
Strudwick, G., Guildford	£780 0 0	£28 0 0
Garnett and Mills, Guildford	753 0 0	32 12 0
Martin, Wells & Co., Aldershot.	644 0 0	Not named.
Whitburn, J., Woking	630 0 0	26 0 0
Pink, R., Milford	626 0 0	34 0 0
Harris, J., Woking (accepted)	550 0 0	16 6 0

Woodford.—For new roads and sewers on the Cricket Field estate, Woodford, Essex, for Mr. E. R. Cook:—

Wilson	£809 0 0
McKenzie	725 0 0
Dunmore	663 0 0
Harris	590 0 0
Peill	577 0 0
Jackson (accepted)	514 0 0

BEST BATH STONE.
Westwood Ground, Box Ground, Combe Down, Corsham Down, and Farleigh Down.
RANDELL, SAUNDERS, & CO., LIMITED,
CORSHAM, WILTS.

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CONTRACTS.

WAR DEPARTMENT CONTRACT.

NOTICE TO BUILDERS.

TENDERS are required for the External and Internal PAINTING and WHITEWASHING, and Works in connection therewith, at Sunderland Barracks, Wane Basin Battery, and Abb's Point Battery, in the Newcastle Sub-District.

Persons desiring to Tender for the execution of these Works must leave their names at the Royal Engineer Office, 13, Belle Grove-terrace, Newcastle-on-Tyne, on or before the 12th day of May, 1881, and pay the sum of 10s. 6d. for the Bills of Quantities, which, with Form of Tender, will be issued to each candidate.

The Secretary of State for War does not bind himself to accept the lowest or any Tender.

LOUIS JACKSON, Lieut. R.E.,
For Commanding Royal Engineer, Newcastle-on-Tyne Sub-District.

Royal Engineer Office, Newcastle-on-Tyne,
27th April, 1881.

WAR DEPARTMENT CONTRACTS.

TO PAINTERS, BUILDERS, and CONTRACTORS.

TENDERS are required for the PERFORMANCE of external and internal PAINTING, PAPER HANGING, WHITEWASHING, and COLOURING of the Barracks at Fulwood, near Preston, in the Northern District, Manchester Sub district.

Parties desiring to Tender for the execution of these works should leave their names at the Royal Engineer Office, Cornbrook Abbey, Manchester, on or before the 16th day of MAY, 1881, paying the sum of 21s. for the Bills of Quantities, which will be forwarded to each applicant as soon as they shall have been prepared by the Government Surveyor

The Secretary of State does not bind himself to accept the lowest or any Tender.

E. HARDING STEWARD,
Commanding Royal Engineer.

Royal Engineer Office, Cornbrook Abbey, Manchester.
20th April, 1881.

WAR DEPARTMENT CONTRACT.

NOTICE TO BUILDERS, IRONFOUNDERS, &c.

TENDERS are required for providing and laying Water Mains at the Permanent Barracks, Aldershot, in the County of Hants.

Parties desirous of tendering for this work must leave their names at this office, on any day from 23rd to 28th May, 1881, between the hours of 10 a.m. and 3 p.m., and pay the sum of 10s. 6d. for the Bills of Quantities.

The Secretary of State for War does not bind himself to accept the lowest or any of the Tenders.

W. B. GOSSET,
Colonel Commanding Royal Engineer Camp.

Commanding Royal Engineer's Office, Aldershot Camp.
April 26, 1881.

WAR DEPARTMENT CONTRACT.

NOTICE TO BUILDERS AND PAINTERS.

TENDERS are required for PAINTING externally certain Barracks, &c., at Aldershot, in the County of Hants.

Parties desirous of Tendering for this work must leave their names at this office, on any day from 23rd to 28th MAY, 1881, between the hours of 10 a.m. and 3 p.m., and pay the sum of 10s. 6d. for the Bills of Quantities.

The Secretary of State for War does not bind himself to accept the lowest or any of the Tenders.

W. B. GOSSET,
Colonel Commanding Royal Engineer Camp.

Commanding Royal Engineer's Office, Aldershot Camp.
April 26th, 1881.

GREAT WESTERN RAILWAY.

The Directors of this Company are prepared to receive TENDERS for the SUPPLY of—

500 Loads Built e Hewn Oak Logs.
100 Selected Logs 1st Quality, Michigan or Ohio White Oak.
140 Loads selected good ni ding Dantzic Red Fir Logs.
200 Loads selected Pensacola Hewn Pitch Pine Logs.
50 Selected Maiden Elm Butts
4,600 Pieces English Oak Scantlings.
50,000 Superficial Feet selected dry Honduras or Mexican Mahogany Panel Boards.

Specification with Forms of Tender (upon which alone Tenders can be received), may be obtained of the Secretary, at the Paddington Station, or of the Storekeeper at Swindon.

Tenders addressed to the undersigned, and marked outside "Tender for Timber," will be received on or before TUESDAY, the 17th proximo.

The Directors do not bind themselves to accept the lowest or any Tender.

FRED. G. SAUNDERS, Secretary.

Paddington Station, London, 29th April, 1881.

GREAT WESTERN RAILWAY.

The Directors of this Company are prepared to receive TENDERS for the CONSTRUCTION of a new STATION at Brettle lane, near Stourbridge.

Plans and Specification may be seen, and Forms of Tender and Bills of Quantities obtained, at the office of the Engineer at this Station, on and after Friday, the 6th proximo.

Tenders addressed to the undersigned, and marked outside "Tender for Station at Brettle-lane," will be received on or before TUESDAY, the 17th proximo.

The Directors do not bind themselves to accept the lowest or any Tender.

FRED. G. SAUNDERS, Secretary.

Paddington Station, London, 30th April, 1881.

GREAT WESTERN RAILWAY.

The Directors of this Company are prepared to receive TENDERS for the ERECTION of STATION COTTAGES, viz., on the Llanelly Railway (3), at Mells, near Frome (4), and at Thorne, near Taunton (1).

Drawings and Specification may be seen, and forms of Tender obtained, at the Office of the Engineer at the Neath, Frome, and Taunton Stations, respectively.

Tenders addressed to the undersigned, and marked outside "Tender for Cottages," will be received on or before TUESDAY, the 17th proximo.

The Directors do not bind themselves to accept the lowest or any Tender.

FRED. G. SAUNDERS, Secretary.

Paddington Station, London, 30th April, 1881.

TO BUILDERS and CONTRACTORS.

The Trustees of the Conservative Club, Liverpool, are prepared to receive TENDERS for the ERECTION of the NEW CLUB HOUSE, Dale-street, Liverpool.

Persons desirous of Tendering should apply to the Architects (Messrs. Francis and George Holme, Peel's-buildings, Church-street, Liverpool) where the Plans, Specifications, and Form of Contract can be seen on and after Tuesday, the 10th day of May, between the hours of 11 a.m. and 4 p.m., and where also Bills of Quantities and a Form of Tender can be obtained on payment of the sum of £2 2s., which will be returned if a bona-fide Tender be sent in.

The Trustees do not hold themselves responsible for the accuracy of the Bills of Quantities, which must be verified by the person desirous of Tendering, nor do the Trustees bind themselves to accept the lowest or any Tender.

The Tenders are to be delivered at the Conservative Club, Dale-street, Liverpool, before 12 o'clock on TUESDAY, the 24th May next, addressed to "The Chairman of the Building Committee," and endorsed "Tender for New Club House."

W. J. BARKER (Major) Secretary.

Conservative Club, Dale-street, Liverpool, 27th April, 1881.

TO BUILDERS and CONTRACTORS.

Persons disposed to TENDER for WORKS in the EXTENSION of the STAFFORD COUNTY LUNATIC ASYLUM, at Stafford, are requested to send their Names and Addresses to me, when arrangements will be made for inspection of the Drawings and Specification.

Quantities will be supplied.

ROBERT GRIFFITHS, Architect and County Surveyor.
Greengate-street, Stafford, April 8, 1881.

NORTH EASTERN RAILWAY.

TO BUILDERS.

The Directors are prepared to receive TENDERS for the ERECTION and completion of WORKSHOPS at York for the Permanent Way Department.

Plans and Specification may be seen, and further information obtained, on application to Mr. William Bell, the Company's Architect, at York, on and after the 3rd May.

Quantities supplied to parties Tendering for the whole of the works.

Sealed Tenders, marked "Tender for Workshops, York," to be sent to the Secretary at York, not later than WEDNESDAY, the 18th May.

Ample security will be required from the contractor whose Tender is accepted.

The Directors do not bind themselves to accept the lowest or any Tender.

C. N. WILKINSON, Secretary.

York, 30th April, 1881.

MIDLAND RAILWAY.

(SOUTHERN DIVISION.)

TO CONTRACTORS AND BUILDERS.

The Directors of the Midland Railway Company are prepared to receive TENDERS for the SUPPLY and ERECTION of WROUGHT IRON GIRDERS for three Bridges under the Railway, near Leicester; also for the IRONWORK of a Footbridge over the Bond End Branch at Burton-upon-Trent.

Plans and Specifications may be seen, and Form of Tender and particulars obtained on application to Engineer's Offices, Derby, on and after Monday, May 9th, 1881.

Sealed Tenders to be sent in addressed to the Secretary of the Way and Works Committee, Midland Railway, Derby, not later than 9 a.m. on TUESDAY, the 17th day of May, 1881.

The Directors do not bind themselves to accept the lowest or any Tender, nor to pay any expenses attending the same.

JAMES WILLIAMS, Secretary.

Derby, 25th April, 1881.

MIDLAND RAILWAY.

(NORTHERN DIVISION.)

TO CONTRACTORS AND BUILDERS.

The Directors of the Midland Railway Company are prepared to receive TENDERS for the

(1) SUPPLY and ERECTION of WROUGHT IRON GIRDERS and CAST-IRON SCREW PILES required for the re-construction of the Swainsley Viaduct over the River Derwent, near Belper Station, on the North Branch.
(2) SUPPLY and DELIVERY of WROUGHT IRON GIRDERS at Darfield Station, on the North Branch.

Plans and Specifications may be seen, and Form of Tender and particulars obtained on application to the Engineer's Office, Midland Railway, Derby, on and after Thursday, the 12th inst

Sealed Tenders to be sent in addressed to the Secretary of the Way and Works Committee, Midland Railway, Derby, not later than 9 a.m. on TUESDAY, the 17th May, 1881.

The Directors do not bind themselves to accept the lowest or any Tender, nor to pay any expenses attending the same.

JAMES WILLIAMS, Secretary.

Derby, May 4th, 1881

TO BUILDERS.

Persons willing to TENDER for the works to be done in the ERECTION of the proposed new TABERNACLE CONGREGATIONAL CHURCH AND BUILDINGS at Hanley, to comprise Church, Lecture Hall, Sunday Schools, &c., and about 22 classrooms, are invited to communicate early with us.

The Drawings and Specifications may be seen, and Bills of Quantities obtained, upon deposit of One Guinea, returnable on receipt of bona fide Tender, at our offices after Monday, the 25th inst

Sealed and properly endorsed Tenders are to be sent in to us, or to J. T. Harris, Esq., Eastwood House, Hanley, on or before MONDAY, the 16th day of May.

The Committee do not bind themselves to accept the lowest or any Tender.

WILLIAM SUGDEN and SON, Architects.

Leek, April, 1881.

HOLBORN UNION.

SCHOOLS AT MITCHAM.

The Guardians of the Poor of the Holborn Union will meet at the Vestry Hall, Rooman-street, Clerkenwell, on WEDNESDAY, the 11th day of May next, to receive TENDERS for ALTERATIONS and ADDITIONS to their Schools at Mitcham, Surrey.

Persons desirous of Tendering may see the Drawings, and obtain a Form of Tender upon application any day before the 4th proximo, between the hours of ten a.m. and four p.m., at the offices of the Architects, Messrs. H. Saxon Snell and Son, 22, Southampton buildings, Chancery-lane, and depositing with them a £20 Bank of England note, which will be returned to those who send a bona-fide Tender, in the manner, and at the time stipulated.

Tenders are to be sealed, and endorsed "Tender for Mitcham School Works," addressed to me, and delivered at my office, at the Workhouse, 158, Gray's-inn-road, W.C., at or before twelve o'clock noon WEDNESDAY, the 11th day of May next.

The Guardians do not bind themselves to accept the lowest or any Tender.

By Order,
JAMES W. HILL,
Clerk to the Guardians.

Workhouse, Gray's-inn-road, W.C., 20th April, 1881.

METROPOLIS LOCAL MANAGEMENT ACTS.

TO MASONS, PAVIORS, CONTRACTORS, AND OTHERS.

The Board of Works for the Plumstead District are prepared to receive TENDERS for laying down certain GRANITE and KENTISH RAGSTONE PAVED CROSSINGS in certain streets in the parish of Plumstead, Kent.

The Plans and Specification for these paved crossings can be seen, and all other particulars thereof can be obtained at the parochial offices in Maxey-road, Plumstead, S.E.

The Tenders for these works are to be delivered at the offices of the Plumstead District Board of Works, in Old Charlton Village, at or before four o'clock in the afternoon of WEDNESDAY, the 11th day of May next.

The lowest or any other Tender will not be necessarily accepted.

By order,
GEORGE WHALE, Clerk to the said Board.

Plumstead District Board of Works, Old Charlton.
28th April, 1881.

TO BUILDERS, REVOLVING SHUTTER MAKERS, AND OTHERS.

BIRMINGHAM SCHOOL BOARD.

The Sites, Buildings, and Repairs Committee of the above are desirous of receiving TENDERS for SUPPLYING and FIXING REVOLVING SCREENS, or divisions, to the various Board Schools, in accordance with particulars prepared by their architects, Messrs. Martin and Chamberlain, 53, Ann-street, Birmingham.

In case screen makers have any particular pattern or design of their own suitable for the purposes required, the Board will be prepared to receive estimates and designs adapted to the special positions of the screens.

The screens will have to be supplied and fixed at times to suit the convenience of the Board, within a period of two years.

The Tenders to be delivered, entirely free of cost, not later than 30th MAY, 1881.

The Committee do not bind themselves to accept the lowest or any Tender.

By order of the Board,
GEORGE B. DAVIS, Clerk.

CONTRACTORS desirous of sending in TENDERS for CONSTRUCTING SEWERS, at High Barnet, are requested to apply to me in writing on or before the 10th MAY, when a selection will be made, and the time will be named when the Plans and Specification may be seen at my Office, the Quantities prepared, and for sending in Tenders.

No guarantee will be given to answer all applications, or that the lowest or any Tender will be accepted.

JOHN LADDS, Architect and Surveyor.
No. 4, Chapel-street, Bedford-row, W.C., 5th May, 1881.

TO SEWER CONTRACTORS,

BUILDERS, AND OTHERS.

The Metropolitan Board of Works will meet at the Office of the Board, Spring-gardens, S.W., on FRIDAY, the 20th day of May instant, at 12 o'clock at noon precisely, and will then be prepared to OPEN TENDERS by parties who may be willing to CONTRACT for the CONSTRUCTION of a length of about 1,000 feet of BRICK SEWER, in Guilford-street, Russell-square.

Parties desirous to submit Tenders may, upon the payment of 5s., obtain the requisite Form, Specification, and other particulars, on application to the Engineer of the Board, at the Office, Spring-gardens, between the hours of 9 a.m. and 4 p.m. (or on Saturdays between the hours of 9 a.m. and 4 p.m.), until Thursday, the 19th day of May instant.

The Tenders, which must be on the Form supplied from this Office, and addressed to the Clerk of the Board, are to be delivered at the Office before 4 o'clock on the last-mentioned day, and no Tender will be received after that hour.

The parties Tendering must be in attendance at the Board at 12 o'clock on the day appointed for opening Tenders, and any Tender which is not fully filled up in every particular will be rejected.

The Board do not bind themselves to accept the lowest or any Tender.

J. E. WAKEFIELD, Clerk of the Board

Spring-gardens, S.W., 3rd May, 1881.

TO BUILDERS.

The Commissioners of Her Majesty's Works and Public Buildings are prepared to receive TENDERS for the ERECTION of a new POST OFFICE, at Barnsley. Persons desirous of tendering must apply at the Barnsley Post-office, where the Plans, Specifications, and a copy of the form of Contract can be seen on and after MONDAY, the 9th inst., between the hours of 10 a.m., and 4 p.m.

Bills of quantities, and a form of Tender, can be obtained at No. 12, Whitehall-place, London, on payment of £1 1s.

The Commissioners do not hold themselves responsible for the accuracy of the bills of quantities, which must be verified by the persons desirous of tendering; nor do the Commissioners bind themselves to accept the lowest or any Tender

The Tenders are to be delivered before 12 o'clock, noon, on TUESDAY, the 24th inst., addressed to the Secretary, H.M. Office of Works, No. 12, Whitehall-place, London, S.W., and must be endorsed, "Tender for Barnsley new Post-office."

A. B. MITFORD, Secretary.

H.M. Office of Works, 5th May, 1881.

COMPETITIONS.

TO ARCHITECTS.

The Directors are prepared to receive DESIGNS for the ERECTION of a PUBLIC HALL in Belper.

Particulars to be had from the Secretary on receipt of 7 stamps.

By order of the Board,
JOSEPH PYM,
Secretary, Belper Public Hall Company (Limited)

Belper, 23rd April, 1881.

NEW CHURCH at WINDERMERE.

Architects are invited to Compete. A Plan of the Ground and the Instructions of the Committee can be had on application to Mr. J. GARNETT, Windermere.

WANTED.

AN ARCHITECT in the City of London is desirous of taking into PARTNERSHIP a well-qualified Young Gentleman. None need apply excepting gentlemen of decided ability in the various branches of architectural knowledge, and skilful in design. He must be willing to pay a reasonable premium. Preference would be given to a Pugin travelling student.—Address, A.R.I.B.A., Deacon's Advertising Offices, 154, Leadenhall-street, E.C.

ARCHITECT and SURVEYOR.—WANTED, on a large Building Estate, a thorough good practical ARCHITECT and SURVEYOR. One who knows and has the confidence of Builders.—Apply, by letter only, stating salary and full particulars to Mr. BUTTON, Stamford Hill, N.

ASSISTANT REQUIRED in a Contractor's office, to assist in drawing-office, drawing, tracing, and taking out quantities. Also to look after and report upon work; must be competent, if required, to set out work. Age not exceeding twenty-five.—Apply by letter, giving full particulars of previous engagements, and stating salary required, to S. S., care of Mr. Polden, 19, York-road, Lambeth.

ASSISTANT (Architect and C.E.'s) Wants ENGAGEMENT. 5½ years' experience in Engineer's Office, and 3 years in a leading Architect's. Good references.—Address, ARCHITECT, High-street, Alyth, N.B

ASSISTANT (Architect's), with good practical knowledge, desires RE-ENGAGEMENT. Is well up in finished, working, and detail drawings; specifications, surveying, &c., and has good knowledge of quantities; 8 years' experience.—E. M. YOUNG, 10, Minster-yard, Lincoln.

ASSISTANT (Architect and Surveyor's, 22) seeks RE-ENGAGEMENT; neat, quick, and accurate draughtsman; well up in office work; working and detail drawings, specifications, &c. Writes shorthand.—GEORGE HERBERT, No. 4, Englefield-road, London, N.

ASSISTANT (Architect and Surveyor's general) Wants RE-ENGAGEMENT at once; thoroughly experienced; quantities, measuring up, superintendence, &c.—ALPHA, 39, Market-place, Leicester.

ASSISTANT (Architect's); has been with two extensive firms in the Midlands. Working and detail drawings, interior, and exterior, perspectives. Levelling and surveying; good references.—Address, T. P., 29, Queen's-road North, Watford, Herts

ASSISTANT (Architect and Surveyor's), experienced in working and competition drawing, as well as in abstracting and billing, seeks ENGAGEMENT. Temporary or permanent. Best of references.—W., 77, Regent's Park-road, N.W.

GENERAL ASSISTANT (Architect and Surveyor's) good, wants RE-ENGAGEMENT. Working and detail drawings, specifications, &c.—Address, A. B., 29, Fairbank-street, East-road, N.

GENERAL ASSISTANT (Architect's), A.R.I.B.A., experienced, desires ENGAGEMENT. Excellent references to first-class offices in Manchester and London. Terms moderate.—G., 90, Shaftesbury-road, Hammersmith, W.

JUNIOR ASSISTANT of 4½ years' varied experience, and of good reference, desires SITUATION. Neat draughtsman; knowledge of specifications, &c.; general office routine; moderate salary required.—Address, JOHN PAGE, New-road, Willenhall, Staffordshire.

JUNIOR ASSISTANT (Architect's) desires ENGAGEMENT in London. Well up in design, perspective, general and detail drawings; highest testimonials; several prizes, specimens; moderate salary.—WILLIAM DAVIS, 34, Alfred-place, Bedford-square, W.C.

TO ARCHITECTS.—Junior Assistant, having completed his articles, requires SITUATION in London or other large town; varied experience; moderate salary; first-class references.—J. L., Box 31, P.O., Walsall.

THE BUILDING NEWS.

LONDON, FRIDAY, MAY 13, 1881

THE ARCHITECTURAL CONFERENCE.

THE third Conference of Architects, the proceedings of which we fully chronicle to-day, terminated yesterday. Quantities and competitions have again occupied considerable attention, and our reports of the discussions will be read with interest. The discussion of the papers on quantities, read on Saturday before the meeting presided over by Mr. Arthur Cates, occupied a considerable portion of Tuesday. Of course old arguments and opinions were repeated, and in the main the resolutions arrived at follow very closely the recommendations of the committee appointed to consider the subject some time ago. The substance of them is that quantities taken off by the architect, or someone in his employ, should be done with the concurrence of the client, and that the charge should be made direct to him, instead of through the contractor; that quantities should form part of the contract, and that when applied for, contractors may be furnished with dimensions. That the surveyor should be invariably employed by the proprietor, or through his architect, and that the surveyor should be rather the servant of the proprietor than the contractor or architect, as he is too frequently now, seems a very reasonable and wholesome principle. It is no less desirable that the architect should be free to supervise the work of the surveyor, and, in fact, that the latter should be under the control of the architect, who should be furnished with a complete schedule of prices. If the "bills" represent as they ought to do the work to be done, it is obvious they should not only form part of the contract, but be taken out with the concurrence and knowledge of the owner, who ought to pay direct for them. That the builder should have the responsibility thrown upon him of checking the quantities at his own risk is an unjust anomaly, and it is quite time the profession came to a few definite resolutions for the general conduct of architects.

With respect to the question of competitions, the lines laid down by the committee appointed in March, 1880, have been followed in the main, and the recommendations drawn up by the Council of the Institute, for the purpose of assisting the Town Council of Glasgow in framing conditions, have been adopted in their general features. The afternoon sitting of Tuesday, under Professor Kerr, nearly lapsed into inanition, owing to the fewness of the members present; and the want of a plan of proceeding, on the heads of those points already discussed. The chairman expressed his inability to read the report, and the summary he gave of it hardly satisfied those present. The discussion, however, soon showed the general feeling. Of the advantages of competitions, if properly conducted, no one is doubtful; it was also clear that the opinion of those present was in favour of the appointment of a professional assessor, but whether he should become the adviser throughout, to draw up the instructions as well as to finally award the premium, was not so evident. Many thought the assessor should be the adviser throughout; then there was the question of getting promoters to agree to such an arrangement; but the chief difficulty we think in the matter is that suggested by Mr. Thos. Porter—namely, that the adviser of the committee on the matter of the instructions may not be the fit or proper person to make a decision on the artistic merit of the designs. In drawing up the conditions of a competition, a local architect of, say, fifteen years' practice, might be more competent to advise the committee than a Fellow of the Institute; but it does not follow that he would be the best man to decide upon the designs when sent in, and this is a difficulty we think the resolution come to hardly solves. Our experience proves that which must have been apparent to competitors, that a man fully qualified to give the committee excellent advice as regards what they require and its cost, may be unable to decide fairly between one design and another. The possible predilections of the assessor for a certain style is a point that was not fully discussed, nor the unfairness of appointing a Gothicist to decide upon a set of Classic drawings sufficiently recognised. But the principle of making it binding upon a committee who thinks of inviting architects to appoint a professional adviser or assessor, one or more, is a good one which may possibly have the practical result of limiting competitions to works of some magnitude. The evening discussion and resolutions pretty well exhausted the subject. We believe the resolutions fairly represent the opinion of the profession, and we are glad the terms of some of them have been amplified and made less restrictive and arbitrary. It would be a great mistake to make the resolutions at the present stage definitive, and we believe the more open the first resolution is left on the appointment of an assessor, the more probable is it that it will be acted upon. Resolution 3 follows, and the fourth resolution, that instead of premiums small payments should be made to remunerate the cost out of pocket of those who compete, is only fair and just, and probably the submission of preliminary sketch-designs previous to the final competition will result naturally from this resolution being carried out. The question of cost, as broached by Mr. Dawson, is important; but this may be left an open question for the time. Every case must be governed by its own circumstances, and we think architects may be content to get the thin edge of the wedge in, as any exacting or arbitrary rules would be kicked at by the promoters of competitions. Another very important resolution was the ninth, referring to payment; and we think it is time the fortunate but unemployed competitor should be remunerated within a reasonable time. Altogether the resolutions arrived at on Tuesday night place the subject on a more comprehensible footing than it can be said to have been on before, and it is some satisfaction that the Conference did not separate without giving some practical effect to their opinions, as no Institute committee-meeting, however ably composed, can discuss and define binding resolutions.

The programme of visits laid down was carried out in a very complete way, but with it few of those who attended were quite satisfied; and for what reason a fourth-rate royal palace and four old City churches were selected for the first day's peregrinations it may be hard to say. Buckingham Palace has never been held up as a model of palatial excellence, nor of tasteful decoration. Compared with Versailles or the Tuilleries, it may indeed be regarded as the poorest royal residence in Europe, as it could boast at the time of its erection from Nash's design as being the "cheapest," having been "built for one sovereign (William IV.) and furnished for another." As a view of the State apartments is not easily obtainable, however, the visit was a welcome one to many who had never had the opportunity of inspecting the palace, though it is unfortunate it was no one's duty to conduct the party over the building, or to give reliable information. It was some little time before the names of the rooms were given, by a not very intelligent attendant, and in the mean time the visitors had to wander without a guide over many of the desolate apartments. Buckingham Palace, it may not be generally known, is a transformation of a red-brick mansion built by the Duke of Buckingham, on the site of Arlington House, early in the 18th century; and the present palace was commenced in 1825, by Nash, for George IV., but was not used till the accession of Her Majesty, when considerable additions were made on the south and east sides, and the late Mr. E. Blore was commissioned to tack on to the original pseudo-Roman building of Nash, the present eastern front of stucco in the Italian style. These respective parts of the palace are discernible after passing through the arched entrance into the quadrangle. But it was to the interior that the visit was made. There is little or nothing to attract notice in the lower household rooms, except that imitation Sienna marble paper and plaster ornamentation, enriched with gold, play a very conspicuous part in the embellishment. Panelled wall-hangings, relieved by pilasters and columns of the Ionic and Corinthian orders, and ceilings adorned with guilloche architraves and gilded ornamentation, are prominent features in most of these apartments, which are generally low, and not well-lighted; though in the planning we meet with instances of those playful interior effects of which Nash has given evidence in some other works of his. The lateral recesses adorned with Corinthian columns in the Bow Library facing the terrace front are examples of skilful arrangement; but the decorations have so marred their effect, that we cannot regard them as successful works in the style. The entrance-hall and grand staircase are spoilt by the decorations in a cheap, shamsumptuous style, and few of the visitors will have failed to notice that the walls of the latter, intended to appear as being lined with marble veneer, are, in reality, only painted imitations, in a taste which distinguishes in a too-emphatic manner the age in which they were executed. The Carrara marble stairs, its gilded balustrading of scrollwork, and its balcony landing, seem to be out of keeping with the tawdry decoration and crude panelled wall-surfaces, with their garish string of blue and gold, and the tympana below the glass lantern. The "Marble Hall," which is really a sumptuous corridor, leads to the staircase, and is probably the worst-lighted hall of any palace in Europe. The Green and Yellow Drawing-rooms are splendid apartments; but the decorations are tawdry, and the same general character may be said to prevail throughout the State apartments, including the Throne-room, the walls of which are hung with crimson satin, relieved by gold and rococo decoration. Probably the visitors will remember with more interest the picture-gallery, with its choice collection of pictures by D. Teniers, Rubens, Snyders, Rembrandt, and other masters of the Dutch, Flemish, and English schools; and the State Ball-room, a well-proportioned apartment, with a massive coffered ceiling in blue and gold, lighted by windows round the upper part. The panels between, filled with emblematic figure-subjects, are, however, wretched attempts. The arched recess, or dais, is boldly managed. This room is on the south side, and is comparatively recent, it being from the design of Mr. Pennethorne, while the decorations are by Gruner. The columns are of scagliola. Another part the architect will have noticed is the roof to the picture-gallery, which is narrow and long, and is entirely lighted through the roof by a series of centre lights and side ranges of domical glazed openings. These three divisions are longitudinally divided by pendent arches, in a more re-

markable than architectural fashion; but the lighting seems to be perfect.

The visits to the old churches, St. Ethelreda's, Ely Place; St. Bartholomew the Great; St. Giles', Cripplegate; and St. Helen's, Bishopsgate-street, were no doubt appreciated by many of those present, and Mr. G. H. Birch threw some light upon the past history of these venerable edifices. Yet we doubt whether architects came prepared to hear dry summaries of dates and registers read to them even of such interesting old fabrics, which have suffered more from neglect and spoliation than from over-zealous restoration. St. Ethelreda and the old priory church of St. Bartholomew the Great, one in the perfected Middle-Pointed style and the other in Norman, will long be remembered by those who saw them as unique examples in those styles. Of course, the circular apse and ambulatory in the last are interesting features, though the insertion of two modern pillars in the centre must not be overlooked. As Mr. Birch pointed out, the similarity between this church and that at Christchurch in Hants is noticeable. St. Helen's (or St. Helena) Church is probably known a great deal less than its merits deserve. The double naves, the fine Perpendicular arcade and roof, and particularly the carved oak pulpit and monuments, make it a remarkable instance of 15th and 16th century work, as it is almost replete as a record or "historical document" of that age.

The visit to the Law Courts was, perhaps, the most noteworthy, as it certainly ought to be the most memorable on the occasion, especially since its architect has been just elected to the Presidential chair of the Institute. Professor Street, R.A., himself met the members of the Conference, and the very numerous gathering, after inspecting the drawings, formed a very attentive audience while Professor Street explained the general plan of the building. He began by saying he had prepared no less than 1,600 working drawings since the work commenced, a number which tells its own tale, and probably very few architects would have prepared so great a number. We can easily understand the restrictions imposed by Mr. Ayrton when Commissioner of Works; and it redounds to the architect's credit that he should have stoutly opposed the higgling policy of economy. Mr. Street was unyielding in his opinion on matters of design, and some architects would do well to follow his example in this respect. The first plan, it appears, proposed twenty-four courts; but those were afterwards cut down to eighteen courts, and now, we understand, the additional accommodation is to be provided elsewhere. The same "economist" in art matters objected to the central flèche, and endeavoured to persuade the architect to adopt a glass roof over the hall, but without avail. To the first the architect yielded; but he knew, ultimately, that, in the end, with a change of Government, the original design might be realised. Time has solved the difficulty, and the flèche will take its intended place on the roof of the central hall.

We have so often described the general plan of the Courts of Justice, it is almost needless to say the block visited by the members of the Conference is the main one, and forms, in fact, the central hall, with its surrounding courts. The hall, which is about 280ft. by 48ft., forms the central kernel of the vast structure which, in its labyrinthine complexity, would have been unintelligible without some previous explanation. There are two sets of corridors on each side, one for the judges, forming the outer line, and another the inner line of communication opening into the courts for the use of the bar. It is in the arrangement of these corridors and their separate entrances, so that the barristers should be distinct from public interference, and the public, or, as Mr. Street calls that section which attend law-courts, the "dirty public," be provided with their own means of entrance and accommodation, that so much ingenuity and skilful planning has been shown. The public have, for example, a corridor provided for them above the bar corridor, and this is approached by the large octagon turret staircases on the Strand front. The judges have their own entrances at the sides and in Carey-street, and their rooms occupy the outer range of rooms on the principal floors. There are eighteen courts, chiefly arranged on each side of the hall, and symmetrical. Alternately with the courts, which are generally about 35ft. by 32ft., are the areas for light, while handsome circular staircases form pleasing features between them. Professor Street said there were no two courts alike, and we find the roofs vary in almost every case. Ventilation has been carried out by Mr. Haden, though the system has been much simplified, and the cost curtailed by some thousand of pounds under the architect's control. The warming is provided for in the crypt under hall, and the system is partly hot-water and partly steam, the latter being chiefly used in the extraction shafts between the courts. The peregrination of the building took some time. Ascending to the judges' corridors forming the outer side, the bold ribbed ceiling, and the traceried windows which admit light between the courts were noticed. The very pleasing though heavy timbering of some of the oak roofs of the courts drew divided opinions; but there is one prevailing point which, no doubt, struck many visitors: the unstinted use of material in every part, and the unbounded wealth of detail. Many took exception to the interrupted roofs, the want of unity in the main elevations, and the lumpiness of the details. The open gallery at end of quadrangle, and the south bar, which has been decorated in polychromy, were passed through, after which the central hall was minutely examined. This will be a fine hall of nine bays, about 25ft. each, and these will be pierced by lofty traceried side-windows, except in one bay, where the roof is ribbed to carry the flèche. The decorations have been done partly by Mr. Bell, and Messrs. Jackson and Graham, and also by the contractors, Messrs. Bull, whose work has been carried out in a manner worthy of the national character of the building. Professor Street spoke in high terms of the work of Mr. Margetson, the carver.

The new Consumption Hospital, Brompton, was visited on Wednesday by a large number, and the visitors were conducted over the building by Mr. Matthew Wyatt, F.R.I.B.A. The lecture-hall was full of plans and details of the building, and the principal points of interest were examined personally. The new hospital, commenced by the late Mr. T. H. Wyatt, faces the old one in the south side of the Fulham-road, and is an addition to it, being connected by a tunnel under the roadway, so that both can be placed under the same management. The plan comprises two wings, connected by a front block, the centre of which and the former being emphasised by projections. On the basement are located the store-room, housekeepers' apartments, Turkish bath, compressed-air bath, servants' hall, &c., connected by the food and passenger lifts with the upper stories. On the ground-floor, the principal centre entrance leads to an inner hall and terrace crossing, which is in the centre of the longitudinal corridor from end to end, well lighted, communicating with the cross wings at ends. This floor is devoted to out-patients and dispensing; at the north-east end of wing is a dispensary with hatches for the supply of medicines. In the front block are placed the physicians' rooms, bedrooms, &c., for resident officers. At the rear-end of west wing is a lecture-hall or theatre, 54ft. by 38ft., with two rows of Roman Doric pillars, encasing iron columns; at one end is a gallery, and at the other a stage for performances.

The mezzanine contains accommodation for the nurses. On the first, second, and third floors are placed the wards, facing south and west, so arranged by front corridors on the north and east sides as to be free from the noise of the street, and contain from three to eight beds. The main front corridors are 10ft. wide. In the centre of each floor is a dining-room, and a special one-bedded ward is provided on each floor. The bath-rooms and lavatories are on the front block, and the nurses' room has complete supervision of each floor. In small annexes to the wings are placed w.c.'s, slop-sinks for each story, and in the rear other similar projections are used for a like purpose, while circular stone stair turrets in case of fire and for workmen, are here found. The kitchen is at the top in centre of building, served with lifts, and is well ventilated and fitted with gas-ovens, hot-plate, boilers, &c.; the passages have cement floors. The warming is a combination of open fires by Barnard, Bishop and Co.'s slow-combustion grates, and hot water on the low-pressure system. Fresh air is admitted through valves, and can be warmed or not; and flues for extraction are shown to all the wards, waiting-rooms, &c., leading into horizontal ashlar flues, lathed and plastered inside with Keen's cement, and these enter four octagonal turrets, in which steam-coils are placed. Messrs. Easton and Anderson have fitted up the lifts, worked by water pressure from a wrought-iron plate tank of 6,100 gallons, placed with its bottom 80ft. above the basement. The iron cage, which was tried by several visitors, is a large one, about 7ft. by 5ft. 4in., and will be used for passengers and other purposes. It will carry a maximum load of 1,200lb. at a slow speed. We may add the well for receiving the ram cylinder is sunk 80ft. below the basement, and in consequence of the water found, iron cylinders were used to tube through the "quick" stratum. Architecturally there is little interiorly; Keene's cement has been used in the columns, arches, and plaster walls; Burke's mosaic pavement in the halls; the windows of wards, dining-rooms, corridors, are double hung, with a fan light, hinged at the bottom and regulated by Elsley's fastenings. Externally the building is faced with Suffolk red bricks, moulded architraves, with strings and plinth sills, and cornices of terra-cotta. The chief architectural relief of the principal façade is the entrance and the flat bay windows above, which form central features, and are executed in Ancaster stone. The front is flatly treated with pilasters, curved gables; the octagon turrets well breaking the masses, and adding much to the effect; the style adopted is Renaissance, but handled with some freedom. Messrs. Higgs and Hill, of South Lambeth, are the contractors.

EXHIBITION OF PICTURES AT THE ROYAL ACADEMY—II.

ONE of the finest pictures of the year is Mr. Alma-Tadema's "Sappho," No. 269. It is a supremely excellent performance of this great master, perfect in conception and execution. It is rather a pity that the title is so short. Some explanation of the subject would have increased the pleasure of those who are not well acquainted with what is known about Sappho and her connection with Alcæus. The scene before us represents an imaginary meeting of the two great leaders of the Æolic school of lyric poetry. It takes place in a beautiful marble alcove overlooking the Ægean Sea—with seats on which the poetess' pupils recline,

listening, with their lovely mistress, to the stirring notes of the rival master. Sappho herself, violet-crowned (as she is called in an extant fragment of Alcæus—"violet-crowned, pure, sweetly-smiling Sappho"), is seated at a desk in advance of the other seats; Alcæus sitting in front, playing upon a beautiful lute inlaid with iridescent mother of pearl. The drawing of the hands, as his fingers touch the strings, is truly admirable; every detail is faultless. The possession of this delightful picture will, indeed, be "a joy for ever." Mr. F. Goodall's principal contributions are two eastern scenes. "The Road to Mecca" (No. 42), and "The Return from Mecca" (No. 50). In the former we see the devout servant of the Prophet, in the boundless desert, having alighted to say his evening prayer, his patient camel standing at his back, the dangers of the pilgrimage being suggested by the half-buried bones that lie in the thirsty sand. The scene is full of joy and refreshment. "Lightly Slumbering" (No. 70), by G. Smith, is a pretty cottage scene painted with care. Mr. W. Logsdale's "Views of Flemish Architecture and Life" are worthy of high praise. Nothing could well be better of its kind than No. 25, "St. Anne's Almshouses at Antwerp." The courtyard is the portion represented, the buildings being partly of stone and partly of brick. Before one of the doors sits a decrepit old woman, while the younger women are following their various callings. There are flowers in pots and the usual complement of brass and copper pans and vessels, such as Teniers and G. Dow loved to paint. The same artist has two other views in Antwerp, equally well painted. Mr. W. Q. Orchardson has but one picture this year, but one of exceptional power and value (No. 142.) It is a portrait of Mrs. Winchester Clowes. Subject and artist are alike to be congratulated upon this admirable portrait. She is dressed in white, sitting in side-view. The back ground is tapestry lightly sketched in. Notwithstanding the richness of colour and technical skill in representing gorgeous dress and jewelry we do not much like Sir John Gilbert's "Fair St. George," No. 149. In a wocdy landscape St. George, clad in silver armour, stands to the left of the picture, having vanquished the dragon. He has told the Princess to bind her girdle about the monster's neck and not to be afeared. The dragon followed as if it had been a meke beeste and debonayre, and she led him into the city. No. 81, by S. E. Waller, represents a sorry "Success." The young gentleman is having a cloak thrown over him as he is about to enter a handsome velvet-lined chariot drawn by four horses, to carry him off as quickly as possible from the scene of his triumph, where his opponent, in a duel, lies dead upon the turf. The conflict has taken place in the grounds of a fine old English mansion. Mr. T. Schäfer is not very successful in his attempt to translate to canvas a part of the "Story of Niobe," No. 83. One of her daughters lies dead, pierced by the arrow of Latona's daughter. The others are looking on with dread of a similar fate soon to overtake them. It wants a much stronger hand to imagine and draw so tragic a subject. There is much to admire in Mr. E. Blair Leighton's elaborate picture "Un Gage d'Amor," No. 1265. A handsome young woman is shown decorating her parting lover's helmet with a red velvet scarf, thinking alike of her love and her fear for the perils which he will have to undergo. Music-book and mandoline, scattered on the ground, show how the happy hours last spent have gone. The knight, meanwhile, looks on with kindly interest as she finishes her work. The painting of the armour and brocade is excellent. In a different way, there is, not far off, a piece of very careful and elaborate painting, by Mr. John G. Naish (No. 1352), "Boulders at Rest," a coast scene, of rocks richly covered with lichens. No. 1383, "An Unpromising Pupil," by J. D. Watson, recalls the manner of P. de Hooghe. The subject is "A Riding-school of the 17th Century," where a lubberly Dutch lad is being instructed in the art of horsemanship, to the great amusement of his friends, who are looking on. The figure of the riding-master, who is giving the lesson, is very good. By H. W. B. Davis we have perfect representations of calm, quiet evening (No. 1416), "The Evening Star," and of "Bright Summer Noon" (No. 263). They are both charming, alike for the admirable painting of the landscapes and the cattle; the foreground of the sunny landscape, with its flowers and grasses, is delightful. No. 252, "Author and Critics," by H. Stacy Marks, is full of humour, capitally told. An author reads his manuscript with much self-satisfaction and energy to two friends, one of whom is smoking and bearing the infliction with stoical patience and little attention; not so his more lively companion, who seems to be saying to himself, "Is it possible that he could write such stuff as that?" He is twisting his moustache as he smiles at his friend's performance. Both of the paintings by Mr. J. R. Herbert, Nos. 259, 299, have a sober religious effect, but the drawing of the figures, especially of the Virgin Mother in the former is strangely incorrect. No. 322, "Galileo before the Inquisition," by Alfred H. Tourrier, gives a good idea of one of the most unpleasant incidents of history. The old philosopher, in his 71st year, kneels before the Holy Tribunal, and for fear of torture, makes the degrading recantation, denying the great fact that the Sun was the fixed centre round which the earth and other planets revolve. "The Ferry," No. 1407, by Robert W. Macbeth, is an important work. We cannot, however, admire the careless way in which the water is indicated; at any distance likely to be got in a room it resembles thick chalk in a semi-liquid state. The figures are well grouped, on the left side three country girls looking on as a roving fiddler, who is accompanied by his wife and family, is tuning his violin; in the front are some boys fishing as the ferry-boat crosses the river. "The Song of Miriam," No. 1413, is on a larger scale than the usual work of Mr. W. Gale. It is not one of his most successful efforts. No. 1590 is a highly finished interior of a philosopher's study, who is seated at a desk in no very amiable humour, just subscribing "your most obedient servant" to a letter he has been writing, probably to some rival savant, who does not agree with him in opinion. "Trafalgar Refought," No. 1412, is a correct and well-finished picture of an English fleet, when our ships were "hearts of oak." An old salt on board one of them is pointing out to a youngster how the victory was won. Mr. J. B. Burgess' most important contribution to the exhibition is No. 29, "The Genius of the Family." It represents a little cropped-haired boy sitting upon the counter of a Spanish crockery-shop, playing a guitar before an admiring audience of all sorts. There is the parish priest, actively applauding the boy's performance; some of the peasants, the leader of the church band, attentively listening, a fine lady and her daughter, as well as his own family. All round the shop there hang the various coloured earthenware utensils, still very like the Hispano-Moorish pottery, which, when transplanted to Italy, caused the production of Majolica, the finest pottery produced since the best Greek period. Every detail of this interesting, and, upon the whole, satisfactory picture will repay the attention. We would especially notice the painting of the old musical gentleman's black velvet coat with silk stripes. It could scarcely be surpassed for accuracy of hue and texture. C. E. Perugini's rather sensational picture of "The Loom," would be more valuable if it had been better drawn. "Milk for the Calves," by Tom Lloyd, No. 20, is a bright, sunny bit of country life. Of the three landscapes by Peter Graham the most interesting is No. 55, "A Mountain Road," a grand stretch of Highland scenery, the hills partly shrouded in mist, a herd of rough Scotch cattle being driven down the rugged mountain road, between heath and long green grass, the half-hidden sunlight flecking the turf in patches as bright as emerald. Mr. R. Halswelle even surpasses the fine Thames views of last year. No. 154, "The Silvery Thames," is one of those beautiful views which the Thames abounds in. Over the low banks you catch a sight of rich, far-stretching pasture with herds feeding. In front is spread, upon reed-set water, a very carpet of water lilies in full bloom. No. 974, "Fenland," is a still more important and equally well painted landscape. The effect of the lurid sky reflected on the water greatly enhances the charm of the scene. Life is also thrown into it by a flight of plovers over their favourite spot. Mr. Henry Moore has seldom sent anything so perfectly delightful as the fine fresh open sea in mid-channel. No. 1006 is a careful and well-drawn study of a nude female. The artist has kindly put the right quantities over the title, Tibicna—to prevent the unlearned from mispronouncing it. "A Pious Fraud" (No. 973) is another of the comical subjects that Federigo Andreotti delights to paint, and in which he usually succeeds. The place is a wine-cellar of a monastery with big butts, dusty bottles, and the usual contents and paraphernalia. While the head butler has fallen asleep with the fatigues of bottling and the potations he has indulged in, his mates are diluting his favourite flask with water, or some other liquid than wine, to the great delight of some of the monks who are hiding behind the casks to watch the fun. "The Funeral Rites of a Mummy on the Nile," by F. A. Bridgman, will please the archæologist more than the ordinary spectator. It is a not unsuccessful attempt to illustrate some of the ancient customs of the earliest civilised people that we have certain records of. It requires a third of a page in the catalogue, to explain the meaning of the various parts. The memory of the discomforts of last winter is vividly recalled by No. 937, "Adrift," by J. M'Intyre. It is a simple incident of a young girl, who, in pursuit of her umbrella, which had escaped in a gust of wind, has got up to her neck in a snow-drift, the truant umbrella being just a foot or two out of her reach. There is not much in it, but what there is is natural and well done.

GENERAL CONFERENCE OF ARCHITECTS.

THE sixth General Conference of Architects, held under the auspices of the Royal Institute of British Architects, has taken place in London during the past week. The first of these conferences took place in 1871, and they were held at first each year, and then biennially, till the fifth conference in 1878, when it was decided to make them triennial.

FRIDAY.

The proceedings were opened on Friday evening, by a reception, at the rooms of the Institute in Conduit-street, by the President and Council. About eighty members and visitors were present during the evening. At 8.30, the President (Mr. John Whichcord, F.S.A.) delivered an

OPENING ADDRESS,

in which he admitted that the programme for the present Conference was neither new nor attractive, being much the same, though in a more con-

centrated form, as that presented at the first Conference, ten years ago, when papers on "Taking Out Quantities and Measuring Works" and the "Commercial Aspect of Architectural Competitions," were read by Mr. John Hebb and Professor Kerr respectively. Both these questions were now better understood by the profession and the public than was the case in 1871. He called attention, in reference to the former question, to the resolution recently passed by the Council of the Institute in reference to the alleged practice of a few architects and quantity surveyors—"a practice whereby an architect without doing a stroke of the work, or accepting one iota of the responsibility, received a share of the commission paid to the quantity surveyor, who, in the interest of their common employer, took out the quantities." The President proceeded to say: On the question of competitions our difficulty does not lie in recommending equitable conditions; the point is how to get such equitable conditions adopted, and then equitably carried out, and further, how, when the conditions of a competition are not equitable, you are to restrain colleagues, especially the younger men, from ignoring their own interests no less than those of the profession to which they belong. Whatever may ultimately be resolved upon in this competition question,—after the Institute Committee on Competitions have finally reported and the Council have discussed the report—whatever professional combination may be found, I trust that the bad aspect of modern unionism may be kept steadily in view, so that we may always know what to avoid. At the same time I admit that some sort of agreement must necessarily be made and adhered to,—such agreement to form a basis for the conduct of those whose interests induce them to take part in this now recognised and systematic lottery. Perhaps it will assist the discussion of this subject and save some heartburning and loss of hard cash if I give you the outlines of a scheme of architectural competition which, within the last week or so, has been devised in order to obtain a variety of designs for a building proposed to be erected in London at an outlay of, possibly, a quarter of a million sterling. In order that you may understand the position, I must tell you that the proposed building is to be erected upon a site already covered with the foundation and basement walls of a huge structure, the construction of which was stopped a few years ago for want of funds. The site, together with the partially executed buildings upon it, have been acquired by a group of well-known and experienced speculators, who, with or without professional assistance, have drawn up the conditions of a limited architectural competition, such as, I think, are unparalleled in the annals of architectural competition. First they send a lithographed plan of the site, showing the foundations existing upon it, and though they believe the measurements of the walls, &c., on the site are strictly accurate, the competitor is advised to carefully survey it, for these foundations are to be utilised. As to the general character of the building to be designed, the competitor is left free to carry out his own ideas, provided above all things that the internal arrangements conform to those of the best similar buildings in this country, or on the Continent, or in the United States. The plans, sections and elevations are to be drawn to a uniform scale of 1-8th of an inch to a foot (unless 1-12th of an inch be preferred by the competitor) with the leading dimensions figured. There are to be elevations of the principal fronts, longitudinal and transverse sections, with a plan of each floor. Each set of designs is to be delivered on or before the 20th of next month; the architects invited to prepare them are some half-dozen men of experience and position, myself being one of the number, and this is how we are to be remunerated. A sum of £150 will be paid to each competitor "towards the out-of-pocket expenses," and "the designs and plans will become the property of the proprietors, who are not to be bound to adopt any of them." Now, gentlemen, when I was honoured with an invitation to join in this competition—it being nearly twenty years since I have been a competitor in an architectural competition—I wrote for further information, and in terms of which the following are extracts:—

"1. I presume that the six or seven architects selected to compete are all Fellows of the Royal Institute of British Architects, or, at all events, of admitted position in the profession. I think the names should be disclosed, that each may form his own judgment on this point.

"2. The sum offered to each competitor towards the cost of his drawings is a satisfactory feature, but it is palpable that the only real prize to an architect of standing would be the ultimate employment to carry out the work, which is one of great magnitude and cost. For this reason the proprietors should bind themselves to employ the architect whose plans are selected, upon the usual terms of professional remuneration.

"3. A professional assessor should be appointed by the proprietors, and his award as to the merits of the several designs should be final. It is hardly probable that the proprietors themselves are qualified to interpret the refinement of architectural design, or to deal with the reputation of six or seven leading architects. At all events, I think that the competitors should be informed who will be their judges.

"4. I do not find in the instructions any allusions to the outlay contemplated upon the building, or any limit as to height and number of rooms. I presume these are points purposely omitted."

The answers I obtained to the foregoing questions were not satisfactory; indeed, they were ludicrously the reverse. I was informed that the proprietors would exercise their own judgment in the selection, that they would be influenced in that judgment, "in favour of a plain building giving the largest number of lettable rooms," and that it was "the object of the proprietors to have a building which would secure the best commercial results." Observe, gentlemen, this is not an instance in which an attempt is made to evoke the latent genius of some heaven-born architect, to call up from obscurity some patient, unknown and struggling artist, who shall produce a monument that may hereafter be regarded as a certain mark in the varying records of architectural history. This is a plain business transaction, proposed by men of an eminently business character, to six or seven members of a profession supposed to be willing at all times to sacrifice its time, its talent, its hard-earned money, if not its good name, in a blind race for a small bag of sovereigns. The six sets of plans for a building which will cost at least £250,000 will be acquired by the proprietors for the sum of £900, and from these six sets—the work of architects of standing and experience—some clever schemer of plans will be enabled to produce a final design possessing the highest commercial advantages which, probably, a contractor may be employed to execute—at all events, no assurance has been given that it will not be so. If there be any one present who has responded to the invitation to compete, on such terms as I have described, for such a building as the one I allude to, I trust that he will refuse to assist in bringing discredit upon his calling as an artist and a man of science. I need hardly add that, after eliciting the information I have communicated, and making a final attempt to get the conditions altered for the good of my colleagues, I declined to join the competition. You will, at the sixth meeting of this conference, have an opportunity to hear and discuss the opinions of two gentlemen practically occupied in the art of mural decoration, a subject which at the last conference, was ably treated by Mr. Armitage, the well-known Royal Academician and professor of painting. I could have wished that William Burges had been alive to join in the discussion, or that our rooms might have been adorned on the occasion with his beautiful designs for mural decoration. The thought displayed in every scheme of wall covering invented or adapted by Burges has always seemed to me to place him high in the ranks of those architects whose practice is concerned with this interesting branch of architecture. Having described the arrangements made for visits to buildings to be made during the Conference, the President added: There is one subject of discussion which, at our first Conference, occupied a prominent place in the programme—a subject which has since that time been frequently discussed within these walls—but which does not appear in the agenda of business prepared for your present consideration. I refer to the subject of Obligatory Examination for Membership. That, as far as we are concerned, is now settled, and such being the case, perhaps I may recapitulate one or two facts connected with the discussion of this important matter during the course of my presidentship. In my first presidential address I treated at some length of the possibility and desirability of preparing for the execution of that by-law (passed in 1877) whereby "all gentlemen engaged in the study or practice of civil architecture, before presenting themselves for election as Associates, shall after May, 1882, be required to pass an examination before their election, according to a standard to be fixed from time to time by the Council." Well, we have fixed the standard for 1882, and in March next the first Obligatory Examination for membership will take place under the superintendence of a Board of Examiners composed of the President, Vice-Presidents, the Honorary Secretary, and seven Fellows. The regulations and programme containing the slight amendments passed at the business meeting summoned to discuss them, are now printed, together with extracts from the Charter and by-laws, the forms of declaration and nomination, and the new rules for the award of the Ashpitel Prize, so that in this publication may be found full particulars of the course to be pursued by students and others for admission to the Institute as Associates. Our object is to direct the attention of professional men, both members and non-members, to the kind of test we propose to apply to young men desirous of earning the honour as well as the advantage of the associateship. And pray observe, gentlemen, I am using no mere form of words. At the present moment every member of the Institute who has received a certificate of proficiency in the Voluntary Examination is distinguished in our published roll by a special mark; and hereafter every Associate who enters by examination will be similarly distinguished. A time will come no doubt when such a mode of distinction may be unnecessary, when most of those who joined under the original rules will sleep the sleep of the just, and the great mass of members will have entered by examination. But for the remainder of this century I may fairly predict that new associates, by examination, will be distinguished, in the roll of members, from their older colleagues. This is what I want gentlemen, who have come here to night from the provincial centres, to tell their pupils. I should like to be assured that, under the fostering advice and direction of architectural societies, students were preparing for the course laid down in this publication to which I have alluded; to know that in Glasgow, Manchester, Liverpool, Leeds, Leicester, Birmingham, Sheffield, Edinburgh, there were small groups of young men who look to the Royal Institute to confirm by examination the training they have received under the guidance of their local societies. But I fancy that some of you are saying of this obligatory examination, "Oh! it is only half an examination, only intended for Associates, and if young men will wait a few years they will be able to enter, full-fledged, as Fellows." It is, therefore, but justice to those who think so that I should disabuse their minds of an undoubted error. You may have observed that lately a very large accession of new members has taken place, and at present about a hundred others are waiting to be admitted as Associates. But comparatively few gentlemen are recommended by the Council for admission as Fellows. The applications, however, are numerous, and if the Council did not oppose every reasonable obstacle to candidates, a large number of new Fellows would be admitted, and would have been admitted during the last year. My opinion is that before the close of 1882 the Council will recommend to the Institute an addition to the by-law referring to the Obligatory Examination of Candidates for Associateship. They will recommend that no gentleman shall be admitted a Fellow until he has passed a certain number of years in the ranks of the Associates—at least, that is my conviction and my wish. Meanwhile, gentlemen, enough has been done and is being done to prove the earnestness of our endeavours, within the Institute, to advance the interests not of the corporate body alone, but of the whole profession of British Architects throughout the world.

Mr. G. E. Street, R.A., proposed a cordial vote of thanks to the President for his address, remarking that in its brevity he had set an excellent example for the proceedings of that Conference. Amongst the subjects he had brought before them came first the comparatively uninteresting subject of quantities. It was not a question in which the present speaker was personally concerned, but he trusted the result of the discussions upon it would be to lead the way to some more regular mode of settlement between client and architect as to these charges. His experience had been that there was no fixed rule

either as to the quantities or their payment. Some surveyors got out these quantities very fully, others just as loosely, and there was in a great many bills an astonishing charge for lithography. Every charge should be as moderate as possible, and there should be no endeavour to go much into detail. He was much more interested in the matter of architectural competitions, as to which he last year presented a memorial, to which were appended an astonishing number of signatures, asking for the appointment of a professional referee in all competitions. He thought the Conference should try to arrange some rules which could be accepted both by those who competed and by the public. The danger was that if these rules were strict, many young architects would decline to join the Institute, because they would be debarred from entering its competitions, and the outside public who arranged competitions would ignore them. Although he was not, and had never been, a competing architect, he should be sorry to stand in the way of those young men who were anxious to make their way in the world in this manner. The instance quoted by the President was certainly one of the most monstrous specimens of an unfair competition he had heard of; but he thought that competitions were not so numerous nor so objectionable as was the case ten years ago, and probably the abuse had worked out its own remedy. The programme of visits was an interesting one, and the afternoon at Mr. Aitchison's house for the President of the Royal Academy was one they would especially look forward to. The subject to be brought forward on the last day of the Conference, that of mural decoration, was one of great interest. Mr. Street explained the scheme just adopted by the Academy, with the sanction of H.M. the Queen, for encouraging the practice of mural decoration, and mentioned that he had, on behalf of his brother-architects, undertaken to seek to find suitable buildings upon which selected young architectural students could be employed in mural decoration at the expense of the Academy for a twelvemonth. Any system of architectural examination, such as that which had just been settled by the Institute involved the more careful education of the architectural student, and therefore must have the sympathy of all members of the profession. His principal objection to the new scheme was that it hardly went far enough, but he understood that it would be made more operative as time went on. Having given an epitome of the new scheme of the Academy, by which it is proposed to increase the inducements offered to architectural students to study and remain longer at school, (which we mentioned last week on p. 509), Mr. Street concluded by formally moving the vote of thanks to the President.

Mr. HORACE JONES seconded the motion, which was subsequently carried with applause, remarking that on the question of architectural examinations he differed diametrically, but he hoped not discourteously, from his dear friend Mr. Street. He had read in Hindu history that when the god Vishnu first obtained the upper hand in heaven, he called to him his old friend and chief counsellor Brahma, and asked what they were to do with the great multitude of good and bad men whom he saw outside heaven. Brahma replied that if they opened the door only just a little bit, only the great and good men would come in, but he advised that they should open it wide and all the people would come up, and as the crowd got up towards the gate they should gradually close the door, so that only the best men would get in. The former he thought was Mr. Street's plan; the latter his own.

SATURDAY.

QUANTITIES.

The business of the Conference practically commenced this morning with a discussion on "quantities." Mr. ARTHUR CATES occupied the chair, and introduced the subject by some prefatory remarks in which he mentioned that the question was first brought before the Institute at the Conference just ten years since, by the late Mr. T. H. Wyatt, the President of the Institute, who recommended that the surveyor be made the agent of the employer, that the bill of quantities be made a part of the contract, the builder being only responsible for the actual work shown on this bill. A committee was subsequently appointed to consider the matter, and they reported that quantities ought to form a basis of the contract, and that if this were done the London practice of appointing two quantity surveyors, one representing the architect and the other the builders tendering, would be unnecessary; they added that to incorporate the quantities in the contract was especially desirable where, as in the provinces, the architect took them out himself. This report was referred back to the committee; but they could suggest no modification, and in June, 1874, the Council stated that they considered that the principal suggestions, those as to the incorporation of quantities in the contract, were so novel, and so much at variance with the existing practice, that they could not advise the adoption of the report. The report was ultimately received, but nothing further was done till May, 1879, when Mr. Honeyman, of Glasgow, read a paper advocating the adoption of the Glasgow system, by which tenders are invited on somewhat speculative or approximate bills of quantities—the work as executed being measured up when finished. On April 12, 1880, Mr. C. G. Saunders read before the Institution of Surveyors a paper on "Quantities and Quantity Practice," and in the discussion which followed, the Chairman said he submitted for consideration the following series of propositions, which had been styled:—

"THE SURVEYOR'S DECALOGUE"

1. That when tenders are required from a number of builders for the erection of a building, it is essential that bills of quantities should be prepared in order that each of them may make his tender on identically the same basis.

2. That, in the absence of special instructions to the contrary, it is the duty of the architect to make the necessary arrangements for the providing of such bills of quantities.

3. That, for this purpose, the architect is the agent of his client, and the client is bound by his acts, whether cognisant or not of them, or of the custom.

4. That, until a tender is accepted, the client is liable to the surveyor, so appointed by the architect, for the amount of his commission and the expenses incurred.

5. That, on the acceptance of a *bonâ-fide* tender, the liability to the surveyor shifts from the client to the builder; the surveyor accepts the builder as responsible to him, and his right of claim against the client ceases.

6. That, if the work is abandoned before a tender is accepted, and contract entered into, the client pays the surveyor; if after, the accepted builder pays, and has his remedy against the client.

7. That, as a matter of convenience, it is the custom that the architect should include, and it is an obligation on the architect so to include in his first certificate, such reasonable charges and expenses of the surveyor; but the liability of the builder is not affected by this practice, and commences immediately on the acceptance of his tender.

8. That a surveyor employed directly and solely by the builder, without the intervention or concurrence of the architect, has no claim against the client, and must look for payment to those who employed him, and on whose instructions he acted.

9. That there are circumstances under which an architect may make himself personally liable to a surveyor, but they are of infrequent occurrence, and are not likely to arise with architects of any standing or repute.

10. That the surveyor is liable to the builder for proved inaccuracies or deficiences in the quantities, and it is an obligation on him to prepare his quantities with the utmost care and accuracy, that the client may not suffer by excess, or the builder by want therein, and to fulfil his important duties with the strictest honour and integrity.

Having referred to a case of an architect who was shown to have taken a share of the quantity surveyor's commission, the Chairman suggested that the discussion might range under the following heads:—1. Is it desirable or expedient that architects should themselves, or by some person in their employ, supply quantities for works to be executed under their direction? 2. If the quantities are supplied by the architect, or some person in his employ, should they not form part of the contract? 3. In the like circumstances, should not payment for the quantities be made by the client direct? 4. Is it not the duty of the person who takes out the quantities to supply to the builder, at his request, and at his cost for copying, a certified copy of the dimensions on which the bills are based? 5. Is it not an obligation on the architect to include the amount of the surveyor's charges and expenses in the first certificate he gives to the builder?

Mr. Sidney Young read a paper on "The Relative Responsibilities of Architect and Surveyor in Relation to Quantities." It was essential to every contract that there should be two parties to it, namely, the party agreeing and the party agreed with. In the subject under notice, the surveyor was one of those parties. Who is the other? It is either the building-owner or the builder, but it cannot be both at the same time, and there were cases in which it may be either one or the other. The well-known cases of Moon *v.* The Guardians of Witney Union was a type of case in which the building-owner, by his default in failing to accept a tender, precluded the surveyor from obtaining his charges from the builder, and no one either in the profession or out of it would question the righteousness of the decision. But, supposing a tender had been accepted, the surveyor could only have recovered his charges from the builder, and had the builder become bankrupt the day after his tender was accepted, the surveyor would have been in the happy position of one of his creditors, and his remedy against the Guardians would have gone. Now the surveyor was responsible for errors to the person with whom he contracted, in other words, to the person who paid him, and, if the builder paid him, to the builder only would he be liable for errors in quantities. He did not know of a case in which a building-owner has ever sued a surveyor, who had been paid by the builder, for *excess* in quantities in which he recovered, but cases the other way, in which the builder, having paid the surveyor, had recovered from him for *deficiencies* in his quantities, were frequent. The War Department, recognising this principle, drew up a circular on the appointment of surveyors, in which they fixed the responsibility of those acting for them by paying them direct, and not allowing their charges to go through the builder. By this means they made a special contract out of the ordinary usage and custom, retaining the services of the surveyor on their behalf, paying him for such services, and looking to him for errors made against them in taking off the quantities; and the speaker contended that the builder could have no claim against the surveyor for deficiency in quantities. But the War Department went further in their dealings with surveyors, for builders tendering were summoned to meet and appoint a surveyor on their own behalf, to sit down with the War Department surveyor, and prepare the estimate, and the builders' surveyor was *also* paid direct by the War Department. This would make the builders' surveyor liable alike to the War Department and to the builder. Formerly it was the practice for each builder to take out the quantities for himself, but it subsequently was found more convenient to employ surveyors, builders frequently appointing surveyors to act for them, and this irrespective of any appointment by the architect. Could it be contended in cases of that description that any liability existed on the part of the surveyor to the building-owner? Now this method of appointing a surveyor was, from a builder's point of view, preferable, but it was attended with too much loss of time, trouble, and inconvenience, and, moreover, there was a third party, the architect, who was naturally entitled to have something to say as to the appointment. The builders therefore virtually delegated the appointment to the architect. This was the way in which architects had acquired the appointment of surveyors; but it did not make the person so appointed anything else than the builder's surveyor, unless a special intimation were given to the sur-surveyor at the time that he was to act for the building-owner, and to be paid by him direct. True, surveyors, almost without exception, considered their appointment as in the interest of the building owner—in other words, that they were to take the quantities as closely and accurately as may be, and it was well that they should so regard their position. It might be alleged against this argument that as the surveyor was thus indirectly appointed by the builders, he ought not to be able to recover against the building owner in such circumstances as in "Moon v. the Witney Union." On the contrary, he ought to have the privilege of doing so, because the building-owner, after having by his architect asked for tenders, might, if he chose, waver in his original intention, and thus be the means of having caused a great deal of trouble and expense to the surveyor, and it would seem from the judgment in that case that the Court so looked upon the matter. Mr. Young mentioned the case, himself v. Dr. Smith, heard in the Court of Queen's Bench, before Mr. Justice Field, who non-suited plaintiff, and a copy of whose judgment was published *in extenso* in the BUILDING NEWS of Dec. 10th, 1879. The plaintiff took it to the Court of Appeal, where on the 27th May last, the appeal was dismissed with costs, on the ground that the building-owner was

exempt from liability for surveyor's charges under the contract with the builder. If that was right, was it reasonable or equitable to suppose that any liability should exist on the part of one man towards another, with whom the law said he had no contract by which he can recover his charges? Surely if A. was not liable to pay B. for work he had done, B. could not be liable to A. for the manner in which he did that work. As to the liability of the surveyor to the builder, in cases in which the charges were included in the summary and paid by the builder, the surveyor is undoubtedly liable to the builder for errors of omission or misdescription in his quantities, although the equity even of this might very well be questioned. The case, Scrivener *v.* Pask, which was tried in the Common Pleas, in which plaintiff was a builder and defendant a building-owner, which settled two points. 1. That if the quantity surveyor issued insufficient quantities, the remedy of the builder was not against the building-owner, but (said by Mr. Justice Blackburn to be) against the quantity surveyor. 2. That the quantity surveyor was not the agent of the building-owner. With reference to the architect taking out his own quantities, he held that to be a pernicious system, for many reasons: it led to secrecy from the building owner, the charges were usually higher than those of surveyors, and the work was generally delegated to a mere clerk in the office, having no special training or aptitude. Further, in the matter of money transactions, builder and architect ought to be kept at an absolutely unapproachable distance; and, again, should errors as against the builder be discovered in the quantities, the probability was that Mr. Facing-both-ways would go to the wall. As a general rule, quantities should not form part of the contract. The surveyor should so take out his quantities that he could stand to the correctness of them as a whole, and not desire to thus shield himself from responsibility for errors. He called attention to a class of advertisement which was being issued by the Commissioners of Her Majesty's Works and Public Buildings, inviting tenders for the erection of a new post-office at Manchester, which declared that "the commissioners do not hold themselves responsible for the accuracy of the bills of quantities, which must be verified by the persons desirous of tendering." The Office of Works might, he thought, have disclaimed all responsibility for the accuracy of the quantities, and have left the builder to settle with the surveyor, should occasion have arisen; but to cast upon him the burden of proving and approving quantities in this high-handed manner, would not commend itself to the profession generally, or to the building trade. He concluded by submitting the following propositions as illustrative of the responsibilities and liabilities of a surveyor:—

1. An architect may employ a quantity surveyor to take out quantities, and if by default of the building-owner no contract is entered into, then the building-owner is liable to the surveyor for the charges (Moon v. Witney Union; Gwyther v. Gaze).
2. If, however, a contract is entered into with a builder, the contract to pay the surveyor's charges by the building-owner at once shifts to the builder, who only is then liable to the surveyor (Young v. Smith).
3. In that event, the surveyor is liable to the builder only for errors in quantities.
4. In cases where the building-owner employs and pays direct the surveyor, such surveyor is liable to the building-owner only.

Mr. J. G. ELGOOD, of Manchester, wrote a paper on this subject, which was read in his absence by Mr. J. Douglass Mathews. He remarked that the prevalent system practised in London of appointing two independent surveyors, one on behalf of the client and the other of the builders was in large works obviously a good and equitable arrangement. In smaller works it seemed unnecessary to divide the work and labour, and it was not ordinarily done. The charge of 1½ per cent. in addition to lithographing was by no means universal. This London system did not generally prevail in the provinces. In perhaps the majority of cases architects took the quantities for their own work, and charged various rates from 1 up to 2½ per cent., and almost invariably the charge was made in the bill and paid by the successful contractor. Where a surveyor was called in, the employment was usually limited to one surveyor. In Scotland an entirely different system prevailed. In the first place approximate quantities were taken out and the bills priced, which served as the basis of settlement at the end of the work, when the whole was re-measured. It was very important that a recognised scale should be laid down for taking out, and in order to provide for the increased labour, for small works a sliding-scale might be adopted, ranging from 1 per cent. for very large works to 2½ for very small ones. One objection to the independent surveyor was that the plan brought in another authority between the proprietor and architect, in some cases giving him practically all the power in the settlement of accounts and money matters — not altogether a pleasant position for the architect. All kinds of methods had been devised by architects and surveyors issuing quantities to protect themselves from responsibility, some very unfair, absurd and inequitable. Most bills start with a heading disclaiming any responsibility for their accuracy, and in many cases throwing the burden of proof on the builder. Having referred to the case of the conditions just issued for the new Post-office, Manchester, the author said the greatest mischief had arisen from these attempts to evade responsibility. They would not and could not hold good in case of a dispute pressed to a legal issue, and as a consequence, they were often referred to arbitration, usually a costly and unsatisfactory mode of "splitting the difference." The only satisfactory remedy, in his opinion, was to make the quantities in all cases a part of the contract, by whomsoever they might be prepared. This would render it of little consequence whether the architect or an independent surveyor took them out, and any inaccuracies would be adjusted at the final settlement of accounts. All might be fairly and straightforwardly done; the builder would feel sense of honourable treatment, and be able to price his work without fear of undefined penalties. The objection raised was that the proprietor would not know what he was going to pay; but there was no great force in it, and it would naturally make clients more careful in selecting a good man. It had been suggested that the Associates of the Institute should be permitted to continue as at present to take out quantities, but that in future the Fellows should be debarred. This might come into operation in 1882, the same time as the compulsory examination.

Mr. MORHAM, the City Architect of Edinburgh, read a paper on the "Professional Position of Surveyors of Builders' Work in Edinburgh." While the more favourable allusions recently made to the systems prevailing in Edinburgh, or more generally in Scotland, might be well merited, their general practice was not the subject of a well-defined system. Among Edinburgh measurers, indeed, there was a fairly uniform understanding on the subject, but no authoritative definition of their professional position, nor were its general principles and practice well determined. Still, he thought with certain modifications and improvements the practice of measuring as followed in Edinburgh might eventually be found to contain the elements of an equitable medium between that system on the one hand, which devolved all risk of error on the measurer, and that which, in an insatiable anxiety to invest in stone and lime, contented itself with an approximate estimate only, leaving the actual cost very doubtful until the building is completed. The measurer was in Edinburgh a public official, and probably the only professional man who, though without salary or specific duties, held his appointment from the local authority. His was a public appointment, shared by an indefinite number of fellow officials. An aspirant to the dignity made application to the authorities, who then remitted to two surveyors of good repute to examine him as to proficiency in the craft, and on their favourable report he entered into a regular bond under penalty, to act honestly and fairly in all questions entrusted to him, and, having further taken the oath to be faithful in due form before the magistrate, he thus became an ordained surveyor, or, in more homely phrase, he was locally denominated a "sworn measurer." The sworn measurer appointed on behalf of, if not by, the employer, for general integrity was responsible to the public authority; in other respects, he was properly responsible to the employer; he was, or should be, furnished by the architect with full documentary information sufficient to enable him to prepare schedules of the quantities of materials and work of the various kinds intended in the proposed building. The fees for measuring and lithographing were added as special items at the end of the schedule, and included in the builder's estimate, and were usually payable from his first instalment. The usual fee was one per cent. on the estimate, exclusive of the cost of lithographing schedules. The accuracy of the measurements was not guaranteed. The builder was required immediately on the acceptance of the estimate to furnish the architect with the priced schedule for the purpose of pricing extras and deductions, if any should occur. The amount of these was ascertained and certified by the measurer, who usually also applied the prices, and extended the account, charging along with it, in a separate item, his own remuneration for this additional work, according to the trouble involved, and receiving it afterwards from the builder. Total remeasurement of the work as executed was only resorted to in cases of extensive deviation from the contract plans. Some architects, either under their own hand, or by employing qualified surveyors in their offices, prepare their schedules for their own works, but this system was not generally viewed with favour, nor extensively practised.

Mr. ROBERT SCOTT, of Glasgow, followed with a description of the mode of dealing with quantities adopted in Glasgow and West of Scotland, which might, in contradistinction to all others, be denominated the "aftermeasurement system." The surveyor or measurer was usually employed by the architect on behalf of the proprietor or building owner. The architect having prepared his general and detail drawings, gave them to the measurer with a complete specification of the several works, or, failing such specification, with the necessary notes and verbal explanations. In the event of there being no detailed specification prepared by the architect, the specification of materials and labour, and the conditions of contract were either embodied in or appended to the "schedule" or "bill of quantities." The "tender" or "letter of offer" was affixed to the "bill of quantities," and the acceptance of this offer by the architect on behalf of the building-owner, in writing, usually constituted the sole contract. In making the after-measurement of the work, the measurer visited the building and took his dimensions as often as might be necessary for obtaining access to and the proper examination of the work, and thereafter prepared the final measurements. The measurer having completed the final measurement, it was handed to the contractor, who rendered it to the architect, by whom it was examined, and, if found satisfactory, the architect granted a certificate for the balance found due after deducting the total amount of certificates previously granted. He urged that this system was equitable, suited to the requirements of building contracts, and conducive to amicable settlements, and proceeded to illustrate his points in detail.

The CHAIRMAN remarked that it would be advisable to eliminate from the discussion any reference to architects taking out their own quantities, as that would be dealt with on Tuesday by Mr. Medlard Taylor. He called upon

Mr. J. A. PICTON, F.S.A., Liverpool, to open the discussion. Mr. Picton observed that he had had a great deal to do with quantities, both as taking them out in his early career and subsequently as an architect, and he would give in a few words the conclusions he had arrived at. The subject must be looked at from two points of view—1st, what was right in principle; 2ndly, what was practicable. First they ought to consider what would be just and upright towards all parties—client, architect, and builder. He would assume that proper skill had been exercised in taking the quantities out, and that there was to be good faith in carrying the work out. Now, if proper skill were exercised in their preparation, it was certain that the work could be as accurately measured before the work was commenced as when it was done. That being so, it was difficult to suggest a sufficient reason why the quantities should not be part and parcel of the conditions of contract, forming a datum from which the contract prices should be calculated. Ojections would only be raised on one or both of two grounds of suspicion of either party—that of greed or incompetency. There were cases now and then in which the architects had pocketed part of the commission of the quantity surveyors, and in those both greed and incompetency could be charged against the man who so acted. The attempt to shirk responsibility for the quantities issued on which builders based their estimates could only be

characterised as a very shabby proceeding. With such a clause as that introduced into the Manchester Post Office advertisement for tenders, builders might just as well take out their own quantities independently from the first. The quantity surveyor ought to be expected to bring to the work an average amount of professional skill and ability, so that the builders could have confidence in him. Still it was possible with the most careful surveyor that mistakes might occur, and if the percentage paid him was only from 1 to 1¼ per cent., it would be so unfair to make him responsible for accuracy that no sane man of business would accept the responsibility. He would say, therefore, that where the percentage was not more than 1¼ the quantities should not be insured, but that a charge of about 2½ per cent. should be made where all risks of incompleteness were undertaken. All these matters ought to be arranged perfectly straightforwardly and above board, and the client should be clearly told from the first that he must pay for quantities in addition to commission. The client would understand his position and the fact of the quantities forming part of the contract would obviate many disputes. In a large matter in which he recently sat as arbitrator, this course was adopted, and, as a consequence, it was very easy to settle the amount due as between client and builder. It was indeed a growing practice in the neighbourhood of Liverpool to adopt the rule he had advocated. There was a practice which could not be too much reprehended, of making the quantities vague, throwing the working out of the details on the builder. Nothing was so conducive to a satisfactory settlement as perfect candour all round. The Glasgow plan of remeasurement on completion was excellent, and prevented over-reaching on either side; but English clients might object to the extra expense it would involve, and still more to the possible increase under such a system of the bill of extras. There was, he believed, nothing of greater importance in the architectural world than to put this question of quantities on the right basis, and he trusted one result of this Conference would be that such conclusions would be arrived at as to practically settle the question for some time to come.

Mr. GODDARD, of Leicester, said the practice amongst leading firms was that they took out their own quantities, it being understood that they were responsible for them; they charged a rather high percentage if the work was small and the accuracy guaranteed. He thought this the best plan possible, in practice of the character of that district.

Mr. RANDALL, Shrewsbury, having expressed concurrence in these views, Professor KERR said that there was a marked difference of principle and practice in the modes adopted in Scotland and England, and with all his partiality for the customs of his native land, he did not think the plan of remeasurement-on-completion adapted for London practice. The almost religious formality of appointing a sworn and ordained surveyor, described with such solemnity by the City Architect of Edinburgh, would be simply laughed at here. In dealing with this question, half the difficulty had arisen from the well-founded supposition that bad faith would exist. He had never heard, and could not conceive, of an instance in which the client would not be informed that he would have to pay for the quantities, though it was possible that, when a quarrel arose as to money matters, the client might say that his architect had not made it clear. The exact position of affairs was, that the architect was responsible to the builder for the client's honesty, and to the client for the builder's honesty, and to both for his own honesty. Mr. Young had gone on the assumption that surveyors were always honest; this might be, and was true of many, but, in London there was a strong prejudice against the class.

MR. RICKMAN, as a measuring surveyor, remarked on the great change that had gone on in the mode of work in his profession since this question was first discussed ten years ago. They had heard a good deal about honourable dealing, and his experience led him to divide contractors into three classes—the first, those who do their work well, whatever price they were paid; another, who would do it thoroughly or indifferently, as they were remunerated; and a third, who could not do their work well however they were paid. The same analogy applied both to architects and surveyors. If clients and their agents were always to be implicitly relied on, and if architects, surveyors, and builders always did their work perfectly, their quantities might advantageously form part of the contract, and all parties would possess in the public estimation better characters than at present. But it was necessary to deal with things as they were, and while there were representatives of the first, second, and third class, this mode of procedure could not be adopted.

Mr. GEO. FOWLER JONES, of York, had found the Glasgow plan of measurement after execution admirable in preventing contests, but the client under that plan sometimes thought he ought to have been more fully consulted as to additional work while in progress. He long since abandoned this in favour of employing a man in his own office to get out the quantities as correctly as possible, and made them the basis of his contracts. If anything material was left out, he arranged to measure it at the builder's expense. That had gone on now for 20 years, and had worked fairly well. It obviated factious opposition and quibbling; indeed, he had had but one contested action, and that, in Ireland, was decided in his favour. In some country places it was even necessary for the architect to employ a clerk of works and charge the exact expense to the client.

Mr. FRANCIS TURNER, barrister-at-law, said the case of Moon *v.* the Witney Union was the sheet-anchor of the quantity surveyor. This case, decided in 1833 or 1834, established the quantity surveyor's right to be paid for his work. It was then held to be unreasonable that the building-owner who failed to obtain a satisfactorily low tender should be able to repudiate all liabilities, and he was pleased to see at Guildhall the other day, a building-owner, who contested the principle, had the sympathy both of judge and jury against him, and lost the day. The decision had had unexpected results on the position of the parties interested, as to the persons who could complain of any inaccuracy in the amounts. Grave objections arose to the architect assuming to act as quantity surveyor, from the fact that he acted as judge between building-owner and builder, as to whether the latter had faithfully fulfilled his obligations or not. This was contrary to the usually received doctrine, that a trustee must not be tempted to abuse his trust, nor must a judge sit in a case in which he is, however infinitesimally, interested. What was the position of an architect who took out his own quantities, and who had been found to have made an error? Perhaps there was not much difficulty where this was in favour of the building-owner, as he had absolute power to refuse a certificate, where such a course was necessary to protect the owner against an unfair charge. But to certify for a larger sum than had been anticipated brought the architect into unpleasant relations with the client. It was, therefore, for several reasons an undesirable position for the architect to occupy. It ought not to exist in large towns, although it was difficult for the Institute to propose to tie the hands of a man who had acquired skill in both capacities as a designer and an estimator. It was in principle correct that if all parties were actuated by integrity, no complications need arise, even if mistakes occurred; but in that case what would become of the legal profession? The objections to the practice were not imaginary; cases had frequently arisen in which an unedifying struggle occurred, usually in the background, between architect, builder, and client, as to the issue of a certificate. When an architect had to continually deal with details which daily become more complex, as fresh inventions were made known, it was important that he should be untrammelled by anything that would tempt him to acts unworthy of the high dignity and character of the profession. He thought the Scotch practice of making the quantities the basis of the contract the fairest to all parties, giving each value for labour, material or money expended. He was only afraid, for his own profession's sake, that this would very much diminish the frequency of building disputes.

Mr. STANLEY G. BIRD, President of the National Association of Master Builders, said this question of vital importance to builders was the first subject discussed on the formation of the Association, and they had arrived amongst themselves at an agreement that quantities ought to form part of the contract. They were strongly in favour of the plan of appointing two surveyors, which was not always adopted nowadays. Whatever might be the outcome of this discussion, he would suggest that there should be a joint meeting of architects, surveyors, and builders to settle the question conclusively by an arrangement fair to all parties. If surveyors would only try and wipe out some of those gentlemen who were making the profession a laughing-stock and almost a disgrace, they would receive the hearty support of builders.

Mr. JOHN HONEYMAN, of Glasgow, mentioned that in that city professional practice was governed by two principles, both of which seemed to be accepted by the Conference. The first was that the quantity surveyor should be employed by and responsible to the architect as the agent of the building-owner; the second that the bills of quantities should be basis of contract. If these principles were generally accepted by the profession, they would necessarily lead to further reforms. He could not understand Prof. Kerr's objection to the introduction into London of a method which he admitted to be well suited to the North, on the ground that it was too exact. One result of the adoption of these principles in the North was that they had there no legal cases arising from building matters. [Mr. F. Turner: Alas! and laughter.] He had not himself had a single case brought into court during a quarter of a century's practice.

Votes of thanks to the readers of papers, proposed by Messrs. MacVicar Anderson and Douglass Mathews, brought the proceedings to a close.

THE INSTITUTE DINNER

was held in the evening, at the Freemasons' Tavern. The President occupied the chair, and was supported by over 120 gentlemen, including Lords Crewe and Talbot de Malahide; Right Hon. Shaw Lefevre, M.P.; Sir J. McGarel Hogg, M.P., Sir Watkin W. Wynn, M.P., Sir P. Cunliffe Owen, Canon Barry, Prof. Newton, C.B., Prof. W. G. Adams, F.R.S., Messrs. J. Abernethy, F.R.S. (Pres. Inst. C.E.), G. J. Symons, F.R.S. (President Meteorological Soc.), Chas. Barry (Past President), G. E. Street, R.A., A. Waterhouse, A.R.A., Horace Jones, E. Ryde (President Inst. of Surveyors), &c. Mr. HORACE JONES proposed "The Houses of Parliament," coupling with the toast the names of Lord Talbot de Malahide, President of the Royal Archæological Institute, and the Right. Hon. G. Shaw Lefevre, M.P., H.M. First Commissioner of Works.

Mr. SHAW LEFEVRE, in responding, remarked that many persons supposed that to obtain a seat in the House of Commons and to make a speech which should resound through the country, was the highest point to which the ambition of an Englishman could rise. But having been a member for nine years, he felt doubtful as to the correctness of that belief. The fame fell somewhat short of that of members of this Institute, for whereas the finest speech had but the ephemeral existence of two days—that on which it was delivered and the next when it appeared as a report in the public newspapers,—and was then entered in Hansard: on the contrary, an architect prepared a design and could afterwards look with satisfaction and delight on it, as it was executed in accordance with his wishes—that is, sometimes,—and the work probably carried down the name of its author to posterity. During the past year two great buildings had been brought almost to completion for the Office of Works; than one of these, the New Natural Museum of Mr. Waterhouse, no more beautiful or original work had been erected of late years. The central hall was equal to anything of its kind, although the objection had been raised that the style of architecture was too severe and Classical for the collections it would contain; but he dare say its architect was anticipating the future day when men of science would come to worship at the shrine of Darwinism. Of the other great group of buildings, the Royal Courts of Justice, it was too early to speak critically; but he believed, when completed, it would be a lasting monument to its architect, and an ornament to the metropolis. If it were not for the presence of the gentleman who proposed that toast, the City Architect, he might have been tempted to reply to the remarks made by the Lord Mayor at the Academy dinner as to the important question of the erection opposite these courts of a memorial which,

whatever its artistic merits, did appear to him to be not altogether happily situated. It had been said that most commissioners of works began by dreaming of some magnificent but imperceptible castle in the air as the result of their reign of office, but ended by congratulating themselves if they had been able to demolish some monstrosity which encumbered the ground. He hoped to be able, at any rate, to effect the latter project, for when the law courts were removed to Mr. Street's new buildings, he proposed to clear away all the incongruous and ugly structures on the west side of Westminster Hall, and it would then be a question whether the space should be left open and Sir Chas. Barry's scheme for the completion of the Houses of Parliament carried out, a design which, although vastly criticised, had certainly given us one of the greatest buildings of the present century. Sir Cunliffe Owen proposed the toast of "Art, Science, and Literature," coupling with it the names of Messrs. G. E. Street, G. J. Symonds, and C. T. Newton. Mr. Street, in responding, remarked that architecture touched science on the one hand, and art on the other. The Divine breath of art coming upon the mere building transformed it into architecture. Indeed, he thought the art which the Institute specially represented was the most important of the group, for it was its buildings which ranked first in the estimate of a country's wealth in the arts. Indeed, following up Mr. Shaw Lefevre's remarks, he believed our legislators would live longer in the public memory by their great buildings than by their Acts of Parliament. Messrs. Symonds and Newton replied at great length, and were very impatiently listened to, the former treating upon the recent advances in the subdivision of electric lighting, and the reported possibility of storing the power, the latter enlarging upon the daily increasing immensity of literary riches entombed in the British Museum Library, which, as Carlyle had aptly said of its class, was "one of the dustbins of history." Mr. MacLachlan, of Edinburgh, proposed the toast of the evening, "Success to the Institute," with which he associated the name of Mr. Chas. Barry, Past President, who, in replying, said Mr. Shaw Lefevre's compliments on the permanency of the architect's works, together with his allusion to the necessity laid on first commissioners to remove ugly structures, had reminded him that "The evil that men do lives after them; the good is oft interred with their bones." The toast of the "President" was proposed by Sir James M. Hogg, and acknowledged by Mr. Whichcord, who then gave the concluding toast, that of "The Visitors," coupled with the name of Mr. R. C. Driver, master of the Clothworkers' Company.

MONDAY.

The earlier part of the day was devoted to visits, and the annual meeting of the Institute was held in the evening.

BUCKINGHAM PALACE.

In the morning a visit was made to this palace, by special permission, and was numerously attended. The building is a well known Palladian adaptation, by the late Edward Blore, On entering by a gateway, beneath the principal front to St. James's-park, a large concrete paved quadrangle is crossed, surrounded on all sides by the palace buildings, which on three sides are faced with ashlar masonry, and on the fourth, the principal block, by stuccoed brickwork. On the left is the grand portico and entrance. The visitors of Monday, however, obtained admission to the palace by a much humbler entrance, on the same side as that of the equerries, and found themselves in a long, low, narrow corridor, having a common marble paper, but hung with portraits of members of the Guelph family, and with paintings of royal processions. From this point they were allowed to grope their own way forward through the two suites of rooms pretty nearly as they pleased, the two attendants in charge vouchsafing no explanation further than the names of the apartments. The first of these, taken in the order visited, is the Household Dining-room, used by the equerries, an oblong apartment, with salmon-coloured distempered walls, decorated with the guilloche in gold. At one end is an Ionic recess, marked off by white Sicilian marble columns. From this opens off to right the '55 Room, so named from having been occupied by the late Emperor of the French in 1855. It is treated in the Corinthian style, profusely decorated with gilding, and scagliola Sienna dado and columns, and contains panelled portraits of Napoleon III., Eugenie, Victor Emanuel, and other crowned personages. The third room seen was the Bow Library, used for the Queen's private dinner parties. It is rectangular on plan, with a circular projection from one of the longer sides overlooking the terrace and private gardens. The principal object of interest in the room is a large ceramic vase, decorated on a chocolate ground with delicately-executed groups of representative nationalities; it was presented by the ex-Emperor Napoleon to the late Prince Consort in 1855, as a memento of the Paris Exhibition of that year. The next is the '44 Room, used by the Emperor Nicholas of Russia during his visit in that year, and has a coffered ceiling, decorated in gold on a blue ground. Following this was seen a Smaller Breakfast-room, in which are several good pictures, including one by Huysman, "Catherine of Braganza," representing the Queen-Consort of Charles II. as caressing a pet lamb wreathed with flowers, and a portrait of "Don Balthazar Carlos of Spain," by Velasquez. The walls of the room are divided into panels by pilasters, having upon them raised serpents and flowers in gilding, and the chairs are, with the exception of damask seats, entirely gilded. This completes the lower suite of rooms, and the visitors passed through the Marble Hall—a long ill-lighted corridor, having Sienna marble wall surfaces, relieved at long intervals with white marble columns, having gilded capitals. Opening from one side of this corridor, by a flight of eight shallow steps, is the Grand Entrance under the principal portico in the courtyard. From this entrance-hall the Grand Staircase leads to the upper suite of rooms. The treads and risers are of white marble, the latter about 5in. in height; the balusters of gilded ironwork scrolls, elaborate in pattern, with a mahogany handrail. At the first landing the staircase becomes double, being carried round a circular well, top-lighted from a dome. At the back of balcony landing are a series of full-length portraits, above these white marble bas-reliefs on red ground, and over these a blue and gold frieze. An inner vestibule, in which are marble statues of the late Prince Consort, airily attired as a Roman warrior, and the Queen, better draped as a Roman Matron, leads to the Green Room, which is hung with green striped damask, and has immense many-lustred chandeliers depending from the ceiling. Beyond is the Throne-room, which is similar in character, except that the hangings are of crimson instead of green; the ceiling here is domed in two portions, the further and smaller being shut off by a bold truss member of large foliage, supported by angels; all these features are of plaster, gilded and coloured. Adjoining the throne on the left is the Queen's private Robing Closet, hung with rich crimson silk fittings, and containing many enamel paintings, and a table of inlaid lapis-lazuli, and other figure marbles, arranged as birds and flowers. Near by is the Ministers' Staircase, and then the Yellow Drawing-room, fitted in yellow silk damask, and having a massive gilded coved ceiling; the Bow-room over the Library, domed, with semi-dome over circular projection; in it are flat (scagliola) Corinthian columns of blue and gold; and the Blue Drawing-room, the counterpart—except in hue of decoration—to the Yellow-room. All these apartments are hung with embossed leather-paper, corresponding to general scheme of colouring. The picture-gallery lies in the centre of this side of the quadrangle, and is entirely lighted by a series of square top lights in centre, and circular lunettes next the walls. The walls are completely covered above the dado level with pictures, chiefly of the Dutch school; they include a large Bacchanalian Feast, by Rubens and Snyders, seapieces by Van de Velde, a fine "Assumption of the Virgin," by Rubens, *genre* examples, by Jan Steen and Teniers, a Dutch Church, by Van der Heyden, and others by Rembrandt, Van Dyck, Poussin, Cuyp, Paul Potter, &c. In a vestibule at the end are hung a fine example of Sir Frederick Leighton's early work "Cimabue's Madonna carried through Florence," and Clarkson Stanfield's "The Opening of London Bridge," radiant with flags and banners, and good in grouping and colouring. This opens into the ball-room, 110ft. by 60ft., used for state balls and concerts. At one end is a large organ-recess and gallery, and at the other an arched alcove; the angles of room are canted off, and the ceiling is coffered by large beams, decorated with the guilloche pattern in gilding on blue ground. In the panels are crystal sun-burners, gas being introduced to this new part of the palace. The room is lighted by double casement windows, high up in walls, and between these are subject panels, occupied by emblematic female figures; the dado is of red silk. A hasty glance into the domed Supper-room on opposite side of picture-gallery, now undergoing a much-needed work of cleansing, completed the inspection.

VISITS TO CITY CHURCHES.

In the afternoon a series of visits were made to City churches under the guidance of Mr. G. H. Birch, A.R.I.B.A., who met the members at *St. Etheldreda's Chapel*, Ely-place, Holborn, and read extracts from the "Proceedings of Archæological Society," showing the history of the Palace of the Bishop of Ely, of which this building formed the only remaining portion. The chapel was erected in the closing years of the thirteenth century, and was a beautiful example of the Decorated style. It covered an area of 80ft. by 30ft., and was 50ft. high from floor to apex of roof, and consisted of seven bays, having deeply-recessed lights, connected by a shallow, blank arcading with canopied heads. Previous to 1874 it was used for a long period as a Welsh chapel, and during that period galleries were erected, the old window tracery and sills, and most of the carving destroyed, and the lower chapel or undecroft was turned into bottling stores. In that year the Fathers of the (R. C.) Order of Charity acquired the premises, and they had since thoroughly restored the building, replacing the tracery, the corbels, and the present oak king-post roof from the remains found built in the walls. The east window had been filled with stained glass by Saunders, of Endell-street, at the cost of the Duke of Norfolk. For the west window,* which was finer in design, a scheme of stained glass had been prepared by Messrs. Hardman, of Birmingham. The undercroft, which, like that under the similar bishop's Domestic Chapel at Croydon, had a beamed roof supported on wooden pillars, had also been restored. In reply to a question, Mr. Birch said these works had been carried out under the direction of Messrs. Young and Wheelan.

St. Bartholomew's-the-Great, West Smithfield, was next visited. It is the eastern portion of the priory church of Austin Canons, including the central tower arch, and one bay of nave, a choir of four bays, and south aisle, and part of that to north. Circular columns, having cushion billet enrichments and cushion caps, carry a blind triforium, having, in each bay, four arches within a containing arch, and over this is an Early English clerestory of two wide lights filled with Decorated tracery. A plain 15th-century wooden roof, having collar-beams supported by angels, is set upon the walls about 45ft. above floor-level. The tower arches are circular to east and west and pointed to aisles, the plan, as at Christchurch, Hants, being oblong, and the spandrels are sculptured devices. At the east end is a series of seven stilted arches carried on circular columns, and outside these an ambulatory. On either side are two meagre iron columns supporting a girder and portion of wall which projects into church beneath the modern casement lights; this projection belongs to a fringe factory at the rear of church. In the south aisle of nave is the commencement of 13th-century shafts and groining in Purbeck marble, in which no attempt is made to coarse fillets with the Transitional piers and Capitals against which they abut. The church is in great need of restoration. Mr. Birch mentioned that the church was founded in 1123 by Prior Rahere, whose canopied tomb occupies the eastern bay of north aisle, and was a large cruciform structure, of which the eastern part, as now seen, was the oldest, the nave having been added in the 13th century. This nave, which was destroyed since 1790, was of nine bays; the popular idea that the beautiful enriched doorway in Smithfield formed the entrance to south aisle being quite unfounded. The transepts of Henry III.'s time were also destroyed in modern

* This window and the doorway to chapel were illustrated in the Building News for June 1, 1877, by measured drawings executed by Mr. C. H. Löhr.

times. The vaulting of eastern portion was never executed in stone, although prepared for. The choir had apsidal side chapels, as at Norwich, the southern of which remained, and is now used as a coal-cellar. Projecting from the south triforium is a 15th-century watching-loft, as at Malmesbury. Beyond the ambulatory, as at Gloucester (and Tewkesbury) was a square-ended eastern Lady-chapel. Mr. Tavenor Perry exhibited a series of working drawings, showing the condition of the church prior to the repairs executed by Messrs. Perry and Reed in 1864, when the floor was lowered 3½ft., and the north aisle wall restored to the perpendicular without rebuilding or disturbing the schools resting upon it. He explained that the two eastern piers of the ambulatory and their arches were then built on the lines suggested by the springers ; but, contrary to expectations, no foundations were found on the site, and it was more than questionable if the scheme had ever before been completed. The apse was not a true semicircle; the ambulatory was set out to a different figure, and all the arches were "fudged," giving evidence of great confusion or carelessness in setting out the work. The present west wall contained some ancient masonry, and the whole church was a puzzle, arising apparently from several changes of plan during the progress of building.

The stay at *St. Giles's, Cripplegate*, was very brief. It is a clerestoried, aisled, Late Perpendicular church, built in 1535, and recently restored under the directions of Mr. E. Woodthorpe, who has covered the wall-surfaces above the arcade with blue distemper, and the lower part of the walls with limewash. In the south aisle is a monument erected in 1862 to the memory of John Milton, who is buried in the chancel; beneath a domed canopy is the poet's bust, and his features are repeated in one of the north corbels of the modern flat Perpendicular roof.

The annual meeting, held in the evening, will be found on p. 561.

TUESDAY.

The whole of this, the fourth days' conference was arranged to be spent in discussion at the Institute Rooms, on "Quantities" and "Competitions." The attendance throughout the day was remarkably meagre, but the proceedings were characterised by animation.

QUANTITIES.

The consideration of this question was concluded at the morning session, when the discussion was opened by Mr. MEDLAND TAYLOR, President of the Manchester Society of Architects, who read a paper, entitled "The importance, and advantage to the client, of quantities and measuring of works being done by the architect of the works or under his own immediate superintendence." He urged that it was a mistake to treat quantity-taking and measurement of artificers' works as apart from the architect's ordinary business. Most clients would say that that they considered their architect responsible not only for the design and proper execution, but equally for the full control of the outlay, and architects would be quite as ready to admit their clients' right to expect this guardianship over their purses. The architect who did not himself control and supervise the quantities and measure-bills relating to the works carried out by him left a corner of the employer's purse unguarded. It was the bill of quantities as priced by the builder that had most to do with settling the cost of any building. A contractor who had carefully priced out his estimate from a bill of quantities, would not be induced to reduce to any extent the total estimate afterwards. Of course, every architect in large practice would feel it a great relief to avoid all trouble and anxiety about these matters, but to leave them to an independent person, but the author held that it could not be so delegated with a due regard to the employer's interests. Quantities, however full and complete the detail drawings might be, were not intended to show the exact amount requisite to make a "good job," and no one else could tell so well what would do—neither too much, which was waste, nor too little, which might be dangerous or near. The architect was tempered by the recollection that if there were an excess in measurement or description, the estimates would be correspondingly excessive, and the drawings might be to be remade, or the client might abandon the work in disgust. On the other hand, if the quantities were deficient, the credit attached to a good building, well carried out in every detail, might be cast in the shade by an unpleasant final reckoning with builder or client. While, therefore, the architect was equally biassed in either direction, the independent surveyor had much to fear if quantities were deficient; but who was there to complain if they were in excess? The pressure was all on one side and against the client. The customs of letting measurement be "enough" or "full," and of making the allowances for waste and otherwise, all tended to keep the estimates up. When quantities represented with accuracy the amount and quality of work and labour that would be exacted by the architect in the building, then only could tenders be fair towards clients, and just towards builders. Where the quantities were taken out by architects or under their supervision, the tenders would be moderate, whilst if an independent surveyor was employed the estimates were both higher and wider. The measuring up was quite as clearly the architect's duty, and it ought not to be shirked by him. The architect who inspected the building in progress was the only man who really knew all the facts of the contract and could determine fairly. A measuring surveyor might give way to a builder's importunities not from improper motives, but because he could not be fully informed of the facts, and an able measuring surveyor could unquestionably make out an unassailable bill of extras, which yet might be very unjust to proprietor and client. The responsibility and superintendence of the execution of work, and the amount to be paid for it, should both rest with the same person. Every opportunity should be taken of making it clear to the public that the work in question is necessary and honourable, and that an architect who gave close attention to this matter was doing his clients not the least important of the numerous services which it was his duty to render.

Mr. MACVICAR ANDERSON read extracts from an address by Mr. Edward Hughes, builder, of Liverpool, recently deliverd before the National Association of Master Builders. Mr. Hughes severely condemned the bills of quantities issued by architects who prepared them for themselves, and stated that it rendered the practice difficult for the architect to act equitably towards the builder in the event of a disagreement arising, or errors being discovered. The paper was printed in full in the BUILDING NEWS for Aug. 13, 1880, and it will be remembered gave rise to a long and warm correspondence in our columns.

Mr. J. L. RANDALL, of Shrewsbury, agreed with Mr. Medland Taylor's views, observing that he was, many years since, articled as an architect and surveyor in London, and regarded the skill and technical knowledge acquired in taking out quantities quite as much a part of his professional powers as that of designing, and one he had a right to use. In his district it was necessary for an architect to take out his own quantities, and should the Institute deem it incompatible with continuance as a Fellow, he and many others would be regretfully compelled to leave that body. For ten or twelve years past he had adopted the Midland Company's system, and had made the quantities part of the contract. He had seen bills of quantities issued by London quantity-surveyors which he should be ashamed to send out of his office.

Mr. CHAS. FOWLER, London, thought while it might be necessary for the architect to take out his quantities in the provinces, it was undesirable in London. The modern system of articling did not give the pupil an opportunity to learn how to do it. The modern rule in all trades and professions tended to extreme subdivision of labour, and greater expertness in reference to the branch to which a man devoted himself. Hence architects not only did not do quantity surveying, but were restricted to a single style of art, and in some cases to the practice of construction without art, such as warehouses. Of course, if he were a thoroughly competent surveyor, no one was so well fitted for the work as the architect who prepared the plans and drawings, but even then it was better to keep free from these details. The late Sir W. Tite always made the quantities part of the contract in large works, but the speaker did not see the reason for this, and feared if the custom were general, the quantities would be less carefully taken out, and the gross amount of a contract would be unknown till its completion—an innovation which the client would strongly object to. It would also involve remeasurement of the whole work, at an additional expense to client.

The CHAIRMAN remarked that it was proposed only to apply the suggestion that quantities form a part of the contract to cases where the architect took them out himself. The architect's estimates in the North were only approximate he believed, till the work was remeasured.

Mr. MITCHELL, of Oldham, had tried both modes of obtaining contracts, and now made a schedule of prices the basis of contract.

Mr. A. WATERHOUSE, A.R.A., considered the feu of remeasurement was somewhat exaggerated in London. In the North he had known considerable deviations to be made during progress of work, which, however, was not remeasured.

Mr. HONEYMAN, Glasgow, said Scotch building-owners were at least as anxious as English clients to learn the exact cost, and the estimates were by no means "mere approximations," as the average amount of deviation between estimate and result of remeasurement was certainly not more than from 2 to 3 per cent. He would not expect at once to see the Glasgow mode adopted in London, although it was unquestionably the best; but if the principle were once admitted that the bills of quantities should form the basis of contract, they must eventually come to it. It was especially desirable in those parts of the country where there were no specially-trained surveyors, as in Glasgow and London, for the architect who took out his own quantities was placed in a very invidious position, and he should indeed only adopt it as a last resort. There should be no mystification as to payment, any more than there was as to settling the account of the bricklayer or carpenter.

Mr. HINE, jun., of Nottingham, thought if quantities were to form the basis of a contract, the architect by whom the building was designed and would be supervised was the proper man to take them out; if not incorporated into contract, the less the architect had to do with the quantities the better. He believed, however, the architect would check off his drawings and often improve or economise material if he took them out, and they certainly afforded the very best training and education of young architects. In reply to the Chairman, Mr. Hine said his father had always made the quantities part of the contract, and the system worked well.

Mr. TAVENOR PERRY thought there were three reasons why the architect should undertake this work himself; in doing so he was compelled to make a full examination of the drawings; he would superintend the work more efficiently; and in settling accounts he would bring more thorough knowledge to bear on the subject, saving time and expense to builder and client. The architect who found a dubious point in his drawings would be more likely to stop and correct it than the quantity surveyor, who had no inducement to inquire into the matter, but must allow a margin for the defective instruction. The saving to client in employing the architect rather than surveyor was sometimes as much as ten per cent. on total cost. In practice he never wrote his specifications till he had taken out the dimensions, and he always supplied the builder with a copy of both.

Mr. MCLACHLAN, Edinburgh, defended the mode of measurement in use in that city as the best. If the architect took out his own quantities, he could not act as arbitrator in any dispute with a builder without loss of dignity, whereas a measurer acted as a buffer between the parties in any squabbles.

Mr. H. W. PEATT had been educated as an architect and surveyor, but on commencing practice for himself determined to have nothing to do with the quantities. The only reason why an architect should take them out was to increase his commission, whereas the man who gave his whole time and skill to the work must be the best to do it. There was a strong temptation to the architect who took them out to shirk thought over details, but to make all alike so as to secure uniformity. If builders were canvassed, three out of four, and he believed a larger proportion, would prefer to tender from a surveyor's rather than the architect's quantities. (Ironical laughter and applause.) He did not mean at all that the former would make them more full, but more accurate ; indeed, the architect was quite as capable of taking them in

excess as the surveyor. The best plan was for the architect to be very careful in selecting his quantity surveyor, and to take care that the drawings were well studied, and the specifications clear. The older plan of calling in two surveyors was to be deprecated on the grounds of needless expense, and the anomalous position of the builder's representative.

Mr. Aldridge, of Liverpool, complained that nowadays builders often did not trouble to look at the drawings, or even the specifications, when estimating, but founded their tenders on a schedule of prices drawn from the quantities. This was undesirable, and the old plan, under which builders took out their own dimensions, although cumbrous and tedious, was preferable in this respect. He believed the architect to be the best man to take out the quantities, and followed that practice himself; in the other case, the architect might place his client entirely in the hands of a surveyor friendly to a contractor. The former plan greatly assisted the architect in realising his design, and often saved time and money to the client. Quantity surveyors were mortal, and feeling their responsibility for mistakes, were tempted to err on the side of sufficiency in quantities. He made the drawings, specifications, and bills of quantities parts of the contract.

Mr. J. Douglass Mathews thought one of the most important parties to a building transaction —the client—had been overlooked in this discussion. A man intending to build consulted an architect with full confidence in his integrity and ability, and would naturally object if he were informed that the architect proposed to hand over an important work, involving the ultimate cost of the building, to a third party, a total stranger. He believed that the retention of this work in his own hands had been of practical advantage, not only to himself, but also to his clients. At the settlement of accounts an architect could easily show the builder what was, and what was not, in the contract, whereas the surveyor could only arrive at the facts after a long and tedious process, and as, where there was no clerk of works, he often derived his information from the foreman, the surveyor received an unconscious bias in favour of the builder. If it were said that the architect would be biassed in arbitrating by his quantities, such a man was not fit to assume the name of architect. The practice appeared to be growing to do without contracts altogether.

Mr. MacVicar Anderson suggested that the practice of architects taking out their own quantities appeared to be so prevalent in the provinces, and in use to some extent in London, that it would be absurd for the Institute to attempt to legislate against it, at any rate, for the present. Still he considered that in the abstract it was undesirable. The more closely architects made their profession an art, the more highly it would be esteemed. Whoever took out the quantites, and especially if the architect did so, it was better to make the charges direct, and not to let the fees come through the hands of any tradesman. The argument of the last speaker, as to the client's loss of confidence in an architect who gave the quantities out, could be applied with equal force to giving the work of construction to a builder; why should not the architect do all the work? He could see no objection to having the quantities part of the contract. Two disagreeable questions had recently come before the council as to quantities, one in which an architect defended himself for sharing commission with the quantity surveyor on the ground that the practice was common, a point on which they were obliged to correct him as to the custom; the other in which a heavy charge was made for an extra copy of drawings for the builder, and he might say that if any gentlemen thought the 5 per cent. commission insufficient for an architect he was perfectly justified in asking more.

Mr. Frederick Dove, Vice-President of the National Association of Master Builders, thought that for a long time to come architects would experience difficulty in getting builders to tender from the quantities they took out for themselves. The practice was generally adopted by young architects, who had a hard struggle to get work, and who, in order to keep the price down, had an inducement to attempt to mislead the builder as to the amount of proposed cost. The remedy would be that quantities should be made part of the contract; but whether that might not lead to more litigation between clients and builders, from the latter calling the quantities in question, he would leave architects to consider. Builders objected strongly to furnishing a complete schedule of prices, but would be willing to submit full particulars as to extras and omissions while the work was being executed. They preferred the quantities prepared by provincial architects to London ones, as they were more clear, having often copious sketches of details, showing the exact construction; whereas a London architect would refuse to allow the details on which he prided himself being hawked about different quantity surveyors' offices. He suggested that, before any change was made in the practice as to quantities, builders should have an opportunity of discussing the matter with architects.

Mr. Scott, Glasgow, urged that London architects must eventually make the bills of quantities the basis of the contract, and the moment they did, the Glasgow system of remeasuring would be as necessary as it was the most fair.

Mr. Poole, Manchester, said during 30 years' practice he had constantly taken out his own quantities, making them the basis of the contract, and had never had a lawsuit with a builder.

Mr. A. Waterhouse, A.R.A., adverted to the enormous advantage to all parties resulting from making the quanties the basis of contract, irrespective of the specification, as it removed interest from all parties in having them either with a margin or not.

Mr. Watkins, Lincoln, agreed with this, and showed the necessity in that district of taking out one's own quantities, explaining that he took them out before writing his specification, and handed a copy to the client for inspection. Builders in Lincolnshire now declined to send in tenders for works over £3,000, unless quantities were furnished.

Mr. E. Boardman, Norwich, had also found it necessary to take out his own quantities, or incur great loss of time in correspondence with the London surveyor who did it; during a practice extending over a quarter of a century, he had never seen any inconvenience arising from the practice. He always consulted his clients as to whether they would incur the expense of having them taken out by him, explaining that if not, they must go to the rag-tag of the city builders for a contract, as a large number would not tender without quantities. He had the dimensions, specifications, quantities, and schedules of extras bound in a book, and kept in office for reference and examination by clients.

Mr. Young had not found quantity-surveyors' pupils, at the end of their articles, able to make out quantities independently, and, therefore, could not understand how, during his five years' training, an architect's pupil could master the technicalities of the art as well as all the details of architecture. There was more litigation over architects' than surveyors' quantities. If quantities were made the basis of the contract, the class of incompetent surveyors would be largely increased, as responsibility for accuracy would be diminished.

Mr. Goddard, of Leicester, said an architect in that district must be his own surveyor, or send to London at great loss of time. The plan worked well in the Midlands, and he deprecated any attempt on the part of the Institute to interfere with the system; any change should be in favour of making the quantities part of contract. He complained that a local man was considered in the provinces as being more expensive than a London one, for whereas the former openly charged 5 per cent. commission, and 2½ for quantities, his Metropolitan brother only showed the commission, the surveyor's quantities being paid indirectly through the builder.

Mr. Medland Taylor, in replying on the discussion, expressed surprise that the London system of a special quantity surveyor had not been better supported by argument. It appeared to be generally admitted, except by Mr. Young, that the architect was well qualified for taking out quantities, and that he benefited by the practice, the only difference of opinion being as to whether it was desirable.

The Chairman, in summing up, referred to the old system of appointing two surveyors, representing the builders and surveyors, still occasionally adopted for large works, and said, although the process was slow, the results were satisfactory. In the increasingly - adopted system under which the architect appointed a surveyor in whom he had implicit confidence, and with whom he was in constant communication, the builders were not represented, and hence it was asked, not unreasonably, that the quantities should be part of the contract, and the surveyor employed and duly paid by the client. The result of this would be that the surveyor would be relieved from his responsibility, and then it was a question whether the risk of the guarantee being removed, if the remuneration should not be reduced. This seemed only logical, but would not the change of practice, while removing temptation to take out quantities, lead to careless work, changes during execution, and consequent remeasurements? The last effect might suit Glasgow people; but an English building-owner's aim was to obtain as accurate an estimate as possible from the first, and to avoid alterations. The effect of the modern subdivision of labour was excellent in enabling a man to apply his energies to one branch, but while he could not imagine anything better than that the work of architect and quantity-surveyor should be kept distinct, he would urge all young architects to serve a few months in a surveyor's office. It was impossible, after what they had heard, to deny that many provincial architects must take out their own quantities; but they had only had speeches from virtuous architects who made quantities part of the contract. He trusted one result of these meetings would be that architects, surveyors, and authorities who endeavoured to protect themselves by disclaiming all responsibility for quantities, while omitting to make them part of the contract, would see that such conduct did not raise them in the eyes of builders or of the outside public. The following choice specimens, culled from the head of a bill of quantities, had just come under his notice:—

"The quantities are condensed as much as possible, and allowance must be made in price for all minor matters and appurtenances, and no claim shall afterwards be made on account thereof, or for any mistake or variation therein, as the builder must include sufficient for the works to be finished complete, the quantities being net."

The Chairman concluded by moving a series of resolutions which had been draughted by Mr. MacVicar Anderson, and which, after a few verbal alterations suggested by Messrs. Waterhouse, Chas. Fowler, Randall, and Poole, were carried nem. con., in the following form:—

In the opinion of this Conference it is desirable—

1. That when architects take out their own quantities, they should do so with the concurrence of their employers; and that the charge for them should be made direct to the employer, as in the case of other professional work, and not through the medium of a contractor.

2. That where quantities are supplied by architects, or by persons in their employ, it is essential that they should form part of the contract.

3. That it is the duty of the person who takes out the quantities to supply to the builder, at his request, a certified copy of the dimensions on which the bills are based.

And that these resolutions be reported to the Council of the Royal Institute of British Architects.

ARCHITECTURAL COMPETITIONS.

In the afternoon, closely following the adoption of these resolutions, the question of "Competitions" was introduced for discussion. Professor Kerr, Vice-Chairman of the Institute Committee, occupied the chair in Mr. Barry's absence. The attendance of architects at no period of the meeting exceeded 15. The Chairman mentioned that they had met under peculiar difficulties, for the committee appointed after the reading of Mr. Porter's paper at the Institute had prepared a report, but would be unable to submit it. This resulted from the fact that the report was ordered by resolution to be submitted to the Council before being issued to the members, and it was of so exhaustive a character that that body had apparently been unable to digest its contents, and had referred it back to the committee on the ground that it dealt with only one portion of the subject. Under these circumstances it would be only possible to indicate the leading features and ask the opinion of the meeting upon them. Mr. Porter had shown in his paper that the net result of most competitions had been a ruinous loss to the profession, *i.e.*, that the actual expenditure of money on drawings greatly exceeded the amount awarded in premiums, and besides this there was a great loss of time and labour, and insult was added to injury, by the unfairness of many conditions. The committee desired to secure fair play and fair remuneration

for those competing. The first could not, perhaps, be always insured, but no body of men need work without adequate payment. He proposed to the meeting three points for consideration: Whether the appointment of a professional assessor would secure fair play; if so, should he be appointed from the first to draw up conditions? Next, whether the principle should not be put forth, that competitors, being the servants of the promoters, should not all be remunerated? and if the conditions were thus altered, should competitions be encouraged or discouraged by the profession?

A conversational discussion ensued, in which several speakers expressed their annoyance that on a technical question of etiquette there should be no substantial proposition put before the meeting for consideration. Mr. Porter submitted, informally, the heads of the report, which appear substantially, although not in the same order and with amplified detail, in the resolutions adopted at the close of the evening meeting. It included the appointment of a professional assessor from the outset of a competition, and the abolition of the premium and motto systems, it being suggested that in works over £3,000 two competitions should be held; an open one free to all, for sketches only, and a limited one by selected competitors, all of whom should be paid an equal proportion of a sum between 1 and 2½ per cent. on the total cost, the selected architect to be actually given the work or to have a legal claim on the promoters. Mr. JAMES BROOKS expressed his approval of competitions in themselves, and suggested that those entering upon them should stipulate as essential that a professional referee be appointed, and if this were granted, as it must be if architects were resolute, endeavour to push the vantage backwards, and to get the referee employed to revise the conditions, and ultimately to prepare them. He was confident that by persistent effort they would slowly impress their views on promoters of competitions. Mr. DAWSON held that the defect of the numerously-signed memorial, promoted by Mr. Cole Adams, and presented to the Institute by Mr. Street, was that it was confined to the appointment of referee after the competition conditions were drawn up, and as adjudicator merely. Such a limitation only made things worse. Mr. COLE ADAMS replied that it would have been impossible to get so large a support to any less general proposal, and that it was a stepping-stone to further progress. He explained that no one who had signed it had thereby promised to abstain from competing where no assessor was appointed, but had merely subscribed to the opinion that this was desirable. He referred in strong terms to the "downright lying" of many architects in their competition estimates. Mr. R. C. PAGE concurred in most of the recommendations, but could not see how they were to be brought before promoters, or enforced upon them, or on young architects; to which Mr. PORTER replied it was proposed to appoint an hon. local correspondent to the Institute in every district, who should post them in any contemplated competition, when the Council would bring their views before them. Mr. PAGE thought this desirable, but feared committees would simply decline to adopt the suggestions, unless architects pledged themselves not to compete where their proposals were not adopted. It was very important to limit the size and detail of competition drawings, as they were needlessly expensive, and the works were never carried out from the premiated designs. He differed from Mr. PORTER as to the excessive cost of competitions, and thought his statistics entirely problematical, and based on too high estimates. Mr. H. W. PRATT thought all architects would desire the appointment of a professional assessor, but the attempt to force it on promoters would lead to the abandonment of the competition, as the assessor's fee would stick in their throats; limited competitions should be rather encouraged. Mr. ALDRIDGE, of Liverpool, remarked on the totally inadequate sums stipulated by committees for proposed buildings as the incentive to architects to give estimates that they knew to be delusive rather than put themselves out of the competition by an honest statement of cost. In no respect was an assessor more needed than to instruct a committee as to the probable cost of a building. Not only were premiums absolutely inadequate, but they were oftened rendered ridiculous, and the mere farce, by the announcement that the first premium would be merged in the commission. An architect should refuse thus to be mulcted of his prize. Mr. PAGE considered the competition should be rather of designers than of designs, and strongly supported the proposed preliminary sketch competition, to which the CHAIRMAN replied by asking what remedy Mr. Page would suggest in a choice of designers if a competitor had the design made for him—a practice not altogether unheard of? In closing the meeting, he suggested the formation of a Competition Society of architects.

ADJOURNED DISCUSSION.

In the evening, the discussion on competitions was resumed. Mr. C. Barry occupied the chair, and having apologised for the non-production of the committee's report, indicated its purport, and said that the Council would be greatly guided in their decision by the expression of opinion they might have, especially from provincial members. The feeling of the Council, guided to a considerable extent by this report, was expressed in the suggestions they recently made to the Municipal Buildings Committee of the Glasgow Town Council, at the request of the Lord Provost. These conditions had been adopted by the committee, but were yet to be submitted to the town-council (they will be found summarised on p. 561, in our report from our Glasgow correspondent). In that case, in which the competition would have to be held over again, the conditions originally issued were incompatible, as a substantial building of a certain area and number and height of floors was asked for, which cubed out at the stipulated cost at 7½d. per cube foot. Such incompatible conditions often led to their being entirely thrown over, and so gave rise to favouritism in the selection. It was proposed by the committee to make the award of the assessor absolutely binding; but he believed this would need to be modified, as promoters having the control of the purse would not abdicate their power of selection, and architects were not at present as implicitly trusted in competitions as were medical men in cases of illness. The premium system was in every way vicious, instilling a gambling spirit into the minds of competitors, and giving promoters the idea that they were obliging the architectural profession, instead of being obliged by them with suggestions at a very low cost. He therefore concurred in their proposed abolition in favour of open and unpaid sketch competitions, to be followed by a limited one in which all received an honorarium. This could not be adopted in very small competitions, for which a different scheme would be proposed. The proposal to appoint local correspondents in each district, to notify the Council as to proposed competitions, was highly important, as at present the Council frequently only heard of a case after the conditions were published, and the promoters then refused to stultify themselves by recalling them.

Mr. BRUTON, Oxford, described the recent Chipping Norton Cemetery competition, in which 70 or 80 designs were sent in for a £10 premium, the total cost being £500; a design from a firm was accepted, and from it, without obtaining specification or working drawings, tenders were invited and after one for £510 had been accepted, the premiated architects were instructed to prepare detailed drawings, &c., without further remuneration. He should like to know if payment was suggested by the committee from the architects indulging in a competition, for he had paid a certain sum of money, in the case of a well-known competition of a few years since, to a man who, in advertising the matter, promised to return the money on receipt of drawings. He sent in drawings, but had never been able to get his money refunded.

Mr. HONEYMAN mentioned that the Glasgow Institute of Architects was also consulted by the Lord Provost, as to the present Municipal Buildings Competition in that city, and they had, without consultation with this Institute, given advice similar in purport. While competitors entertained and evinced the idea that they were benefited by being allowed to compete, committees would feel justified in offering very little inducements. He feared it would be difficult for architects to give expression to their views, as those who would make united action were in a terrible minority. Mr. J. FOWLER, Louth, urged the importance of binding promoters to adopt the plan recommended by the referee; but several speakers pointed out the difficulties in the way. Mr. WATERHOUSE said, in his experience as an assessor, several matters had struck him from time to time. One was that very often the instructions issued restricted the competitors too closely, and also hampered the referee. Another thing was that promoters needed to be informed that architects did not care for their premiums, but were anxious to get their work, and this would be facilitated by abolishing premiums. Competitors often adopted a mistaken course by sending in alternative designs. The second designs, being often late and unaccompanied by an attached description, gave much trouble to the referee, and acted rather to the competitor's detriment, as indicating that he had not decided what was best. He knew he was treading on delicate ground when he suggested that the modern practice of sending designs in black and white might advantageously be abandoned for the older plan of colouring them; but he believed the latter method, for perspectives, showed more distinctly the architect's artistic capabilities. One word as to the morals of competitions. Many men who would not utter a word that was not true, allowed their pencils to tell lies; many a tower and spire was carried higher in the perspective than the elevation or section would warrant. Mr. Pownall asked Mr. Waterhouse his opinion of sketch-competitions—as for Manchester Town-hall, for instance? Mr. Waterhouse: Oh, there, I think, it worked very well. (Applause.) The CHAIRMAN then read *seriatim* proposed recommendations to the Council, which, after an hour's further discussion and slight amendment and amplification, were finally agreed to as follows:—

1. That the promoters of an intended competition, as their first step, should appoint one or more professional assessors, Fellows of the Royal Institute of British Architects (of not less than fifteen years' practice), whose names should be published in the original advertisements and instructions.

2. That the assessor or assessors ought to draw up the particulars and conditions, or advise upon and supplement them if already drawn up.

3. That the decision of the assessor or assessors ought to govern the choice unless insuperable objections shall arise.

4. That competitions should be initiated either (A) by inviting preliminary sketches involving only moderate cost to each competitor, preparatory to a final competition, or (B) by personal invitation without sketches.

If (A), by advertisement, inviting architects willing to compete for (here describe the intended work) to send in their names by a given day, on receipt of which each applicant will be supplied with the instructions prepared under the advice of the professional assessors. Each applicant from such instructions to send in by a given date a sketch design (here describe limit and character of such sketches). The promoters, with the advice of the professional assessors, will select from such sketch designs not less than (here specify the number), the authors of which shall be invited to join in a final competition, in which each shall receive for the preparation of his design a sum to be fixed by the promoters, with the advice of the assessors. From these designs a choice to be made of the architect to carry out the work.

If (B) without sketches: by advertisement, inviting architects, willing to compete for (here describe the intended work) to send in their names by a given day, with such other information as the candidate may think likely to advance his claim to be admitted to the competition. From these names the promoters, with the advice of the professional assessors, will select (here specify the number) to compete; and each competitor thus selected will receive £ (here state the amount) for the preparation of his design. From these designs a choice to be made of the architect to carry out the work.

5. That the eventual employment of the author of the best design, as the only real prize of the competition, ought to be considered an obligation of honour, if it can reasonably be accomplished.

6. That every member of the body promoting the competition, and every assessor, must necessarily abstain from taking part in the competition, or acting as architect in the execution of the proposed work.

7. That the work, if carried out in any shape, should be placed in the hands of the architect whose design has been adjuged to be the best, and he should be thereby placed in exactly the same position in relation to the employer and the intended work, as he would have been had he alone been professionally consulted.

8. That in case a competition has resulted in the selection of an architect, and the instructions to him to proceed further in the matter are not given within twelve months from the time of the architect being so selected, he should be paid at the usual professional rate, under the advice of the assessors, inclusive of the sum paid to him in common with the other competitors, and such payment should be taken on account of commission, should the work be at a future time carried out from the designs submitted by him in competition, and under his superintendence.

9. That if the employer desires to possess or retain any other of the designs, except the one adjudged to be the best, he should have the opportunity of doing so by making payment to the author (if he be willing to part with his drawings).

10. That where preliminary sketches are submitted, each competitor should be at liberty to sign his sketches or adopt a motto; but in all other cases he should sign his name to his drawings.

11. That the Council of the Royal Institute of British Architects be respectfully requested to take the initiative

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ILLUSTRATIONS.

NEW STABLES FOR THE MARQUIS OF LONDONDERRY.—NORTH HALL, NEWNHAM.—HOUSE AT RANMOOR, SHEFFIELD.—GARWAY CHURCH, HEREFORDSHIRE.—NEW WESLEYAN CHAPEL, SURBITON.—BÖHLER MEMORIAL CHAPEL, COMMERCIAL-ROAD.

in establishing a system of competition on the above basis, and in procuring for it the adhesion of the whole profession throughout the country.

WEDNESDAY

Was a day of visits. The Law Courts were inspected in the morning, under the guidance of Mr. Street, as referred to elsewhere. In the afternoon Sir F. Leighton's residence in Holland Park-road was visited by a large party, when Mr. Aitchison's mode of construction and scheme of decoration were freely discussed, the colour and ornament, especially in the Arab Hall, evoking general and little-qualified admiration, although some of the structural details of the house, the absence of lintels or flat arches from the east arcade and some window-heads, and the manner adopted for uniting the Mooresque and Renaissance features came in for some criticism. The choice collection of pictures and other works of art, with which the house is filled, were examined with great interest and pleasure. The staircase and other details were illustrated in the Building News for November 9 and 30, 1866; the interiors of study, dining-room, and hall, December 22, 1876; the garden-front, by a perspective (accompanied by a full description), October 1, 1880, and the interior of Arab Hall, October 8, 1880. We have referred in another column to the visit afterwards paid to the new Hospital for Consumption, at Brompton. In the evening a *conversazione* took place at the Institute rooms.

THURSDAY.

In the morning a visit was paid to Lambeth Potteries, by permission of Messrs. Doulton and Co., and in the afternoon Sir Richard Wallace, Bart., M.P., received the members of the Institute, and those who had taken part in the conference, at his town residence, Hertford House, Manchester-square.

Last evening the closing meeting of the Conference was to be held under the presidency of Mr. Street, when papers on mural decoration were to be read by Mr. Ford Madox Brown and Mr. J. D. Crace, to be followed by a discussion. We shall continue our detailed report of the Conference proceedings next week.

It will be remembered that Earl Cowper, after promising to subscribe £500 towards the restoration of St. Alban's Abbey, objected to some of the work that was being done there. Consequently he refused to pay his subscription. Thereupon, an action was brought against him by the Earl of Verulam and the rest of the committee, to recover the sum, the work having been contracted for. On the eve of the trial Earl Cowper's defence has, it is said, been abandoned, under high legal advice.

Frome St. Quinton Church was reopened on Wednesday week after restoration by Mr. Davis, builder, of Langport. No architect's name is mentioned in the local account of the restoration; but we see it stated that "the walls in the interior have been scraped, and coloured where necessary; and the font, an exceedingly old piece of stone-work, has been brightened."

OUR LITHOGRAPHIC ILLUSTRATIONS.

NEW STABLES FOR THE MARQUIS OF LONDONDERRY.

Our illustration represents a group of stable buildings about to be erected in Brick-street, Park-lane, for the Marquis, under the direction of Mr. James Brooks, and is taken from a drawing in the present Exhibition of the Royal Academy. There will be accommodation for fourteen horses in one range of buildings, placed next a central court of somewhat irregular form. Of these, twelve will be in two six-stall stables, and two in loose-boxes, while four more horses will be placed in loose-boxes in another range of buildings on the opposite side of the court. There will be also a cleaning-shed for horses, a harness-room, and a spacious shed enclosed all round and lighted by a skylight for the carriages and for carriage-cleaning operations. On the first floor, facing Brick-street, will be a residence for the coachman, and the remainder of the upper story will be occupied with lofts and dormitories, and mess-room for eight helpers, together with lavatories, etc. The buildings will be faced with red brick, all mouldings being formed in the same material, and the stonework will be of red Mansfield. The sides of the cleaning-spaces will be faced with glazed bricks, which will be introduced in bands of different tints, and a dado of Staffordshire blue bricks will be formed on the face of all the walls next the stable court. The flooring of upper story throughout will be fireproof. The surfaces of loft floors will be of asphalte, and the rest of Gregory's wood-block paving or Minton's tiles. The roofs are intended to be covered with Pen Moyle green slates; and thorough ventilation is proposed to be introduced through the whole range of buildings. The stables and loose-boxes will have fresh air admitted by means of large gratings in the window recesses, and the supply regulated by hinged flaps; vitiated air will be extracted by shafts from the ceilings of the stables, communicating with Sharpe's Crown ejectors fixed above the roofs. The stables and coach-houses will be paved with Adamantine clinkers, and the whole of the fittings will be supplied by Messrs. Musgrave. It is intended that these shall comprise the most recent improvements in this branch of manufacture, and that the sanitary arrangements shall be of the most perfect description. The carriage-houses and harness-room will be kept warm by hot-water coils, and means of drawing hot water as well as cold will be provided both in the carriage-cleaning place and the horse-cleaning place. Every endeavour will, in short, be used to render the establishment thoroughly fitted for the purpose for which it is intended.

NORTH HALL, NEWNHAM.

North Hall is the second portion of Newnham College, which has been built, the former part having been opened in 1877. The present building accommodates about 38 students, and is arranged for future extension. It was opened in Oct., 1880. The cost was about £10,000. Messrs. Bell and Sons, of Cambridge and Saffron Walden, were the contractors, and Mr. W. H. Williams clerk of works. Mr. Basil Champneys is the architect.

HOUSE AT RANMOOR, SHEFFIELD.

This house has been erected at Ranmoor, near Sheffield, from the designs of Mr. E. R. Robson, F.S.A.

GARWAY CHURCH.

This remarkable but little-known church, dedicated to St. Michael, of which we give this week a series of illustrations, has for some years been undergoing a gradual and conservative restoration. It possesses two probably unique 12th century features—a massive tower, 27ft. square, standing at an angle about three yards from the N.W. corner of nave and connected with it by a covered passage, and an elaborately-carved chancel arch, in excellent preservation, possessing some unusual features. A gallery formerly extended across the west end and halfway along the north side of the nave. When this was removed, the cap of the churchyard-cross was fortunately discovered serving as a foundation-stone to one of the posts, and the cross itself was found a short time before in a farmyard. The steps, base, and portion of the octagonal shaft are in situ on the south side of the nave, and the cross will shortly be restored according to the design illustrated. The incised stone altar was found bottom upwards amongst the paving, and is now in its proper position again. The nave and chancel were a short time back completely blocked up with large high-backed pews of every imaginable shape and size, and the chapel was partitioned off from the church and used as a Sunday-school. All this has now been changed in accordance with the plan we publish, the fifteen 14th-century oak benches, with ends 4in. in thickness, placed in the nave with ordinary church chairs to make up the required accommodation for worshippers, while the font has found its way to the west-end entrance again, and the space in tower below the ringing-chamber has been floored and utilised for a vestry. The original 14th-century curved roof-timbers over the nave have been found to exist behind the plastered ceiling, and will be shortly opened out. It is not proposed to make any changes in the exterior, except those repairs which the neglect of the past century and a half render necessary. The Knights Hospitallers of Jerusalem, and possibly the Knights Templars before them, lived in the religious house hard by, the only portion of which that has escaped destruction being a circular columbarium, with an inscription carved in the tympanum of its doorway adverting to the fact that "Brother Richard" erected it in 1326. The Incorporated and Local Church Building Societies have both assisted the work with grants; but owing to the principal landed proprietor being a Roman Catholic, there is great difficulty in providing the funds required. Mr. E. H. Lingen Barker is the architect engaged.

NEW WESLEYAN CHAPEL, SURBITON-HILL.

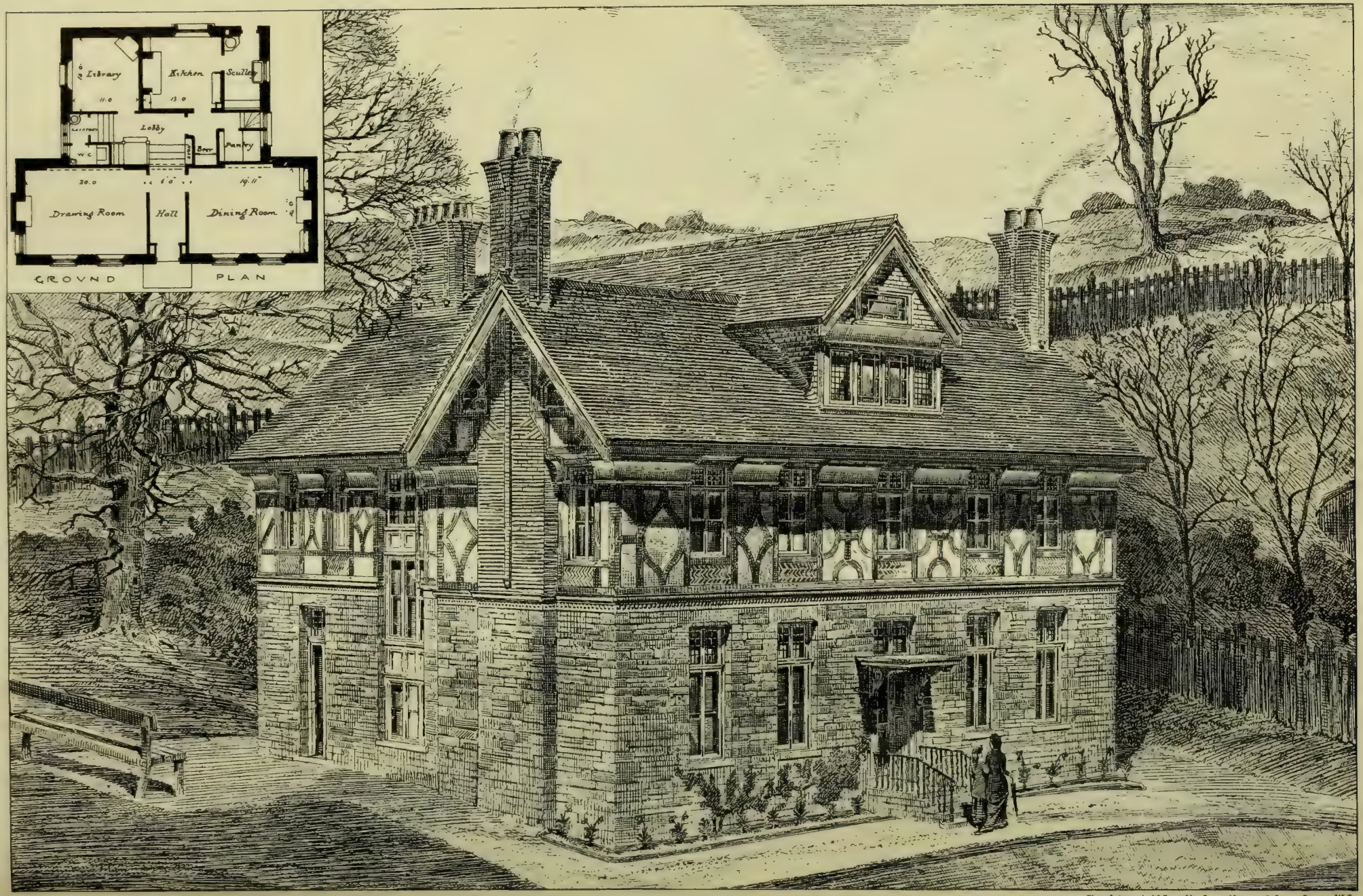
This chapel is one of the ten to which the late Sir F. Lycett gave an extra sum of £500 if erected this year. It will occupy a fine site on Surbiton-hill in the main road. The materials are best red bricks and Bath stone, and the roofs of slate. The chapel only will be built at present, space being left behind it for schools. 1,000 sittings are provided, 660 on ground-floor, 330 in galleries. The tower and spire are about 120ft. high. The works will be begun at once. Mr. Charles Bell, F.R.I.B.A., Dashwood House, 9, New Broad-street, is the architect. The cost is a little over £5,000.

BÖHLER MEMORIAL CHAPEL, COMMERCIAL-ROAD, E.

The ground-floor is occupied by school and class-rooms, heating-chamber, offices for boys and girls, &c. The height of these rooms is about 13ft. clear. The chapel is 59ft. by 37ft. 6in., and has a gallery round three sides, the end one being deep. The ceiling is a very flat curve, and is some 30ft. from floor to highest part. Ventilation is by inlet tubes and two large Howarth's ventilators in roof. The building is of red brick. The fact that the chapel stands over the East London Railway necessitated placing the tower where it now stands, this being clear of the tunnel. The rest of the chapel is on the tunnel; this incurred additional expense in the foundations. The tower-roof is tiled, the chapel slated. Mr. J. Bentley, of Waltham Abbey, is contractor for the superstructure, and the work is being carried out under the supervision of Mr. E. Early Hollis at a cost of £3,900.

The Commissioners for the Sydney International Exhibition, have given a "Third award," "based upon inherent and comparative merit, with their diploma and medal," to Mr. Thomas Goodman, architect, Southend, for his picture of the ancient porch of the parish-church of South Benfleet. This picture was first exhibited in London, and was selected by H.M. Commissioners to represent with others English Art at the late Paris Universal Exhibition, and subsequently for the Sydney and Melbourne International Exhibitions. A copy, we should add, was purchased by the authorities at South Kensington, for the schools connected with the Museum.

St. Anne's Church, Bewdley, was reopened on Monday, after important renovations and improvements. The new chancel-window and new brass-work for chancel has been supplied by Messrs. Jones and Willis, of Birmingham; the other work has been carried out by Mr. Christopher Pountney, of Bewdley, under the superintendence of Mr. Meredith, architect, Kidderminster.



HOUSE · AT · RANMOOR · SHEFFIELD

E. R. ROBSON F.S.A. ARCHITECT

Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

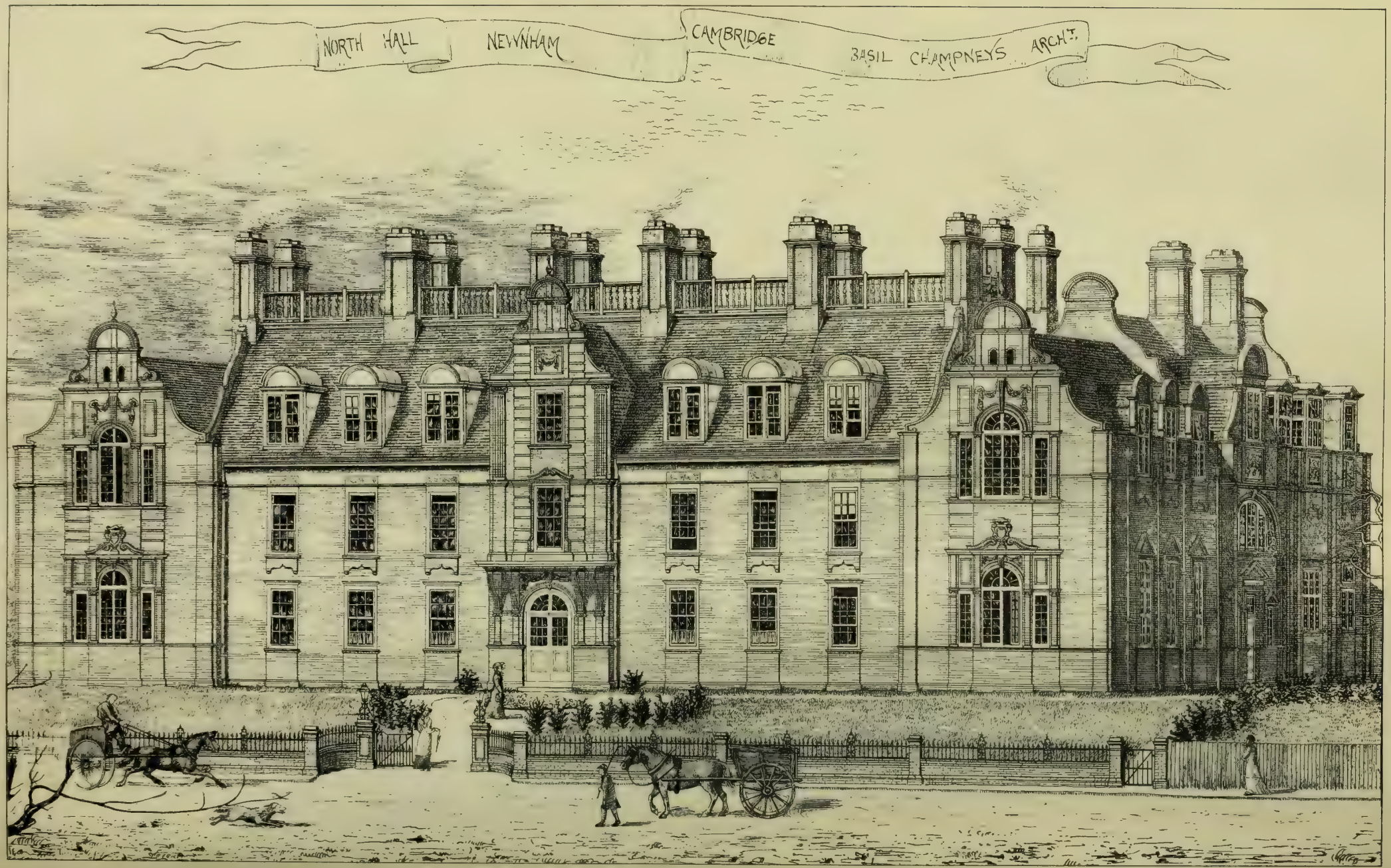
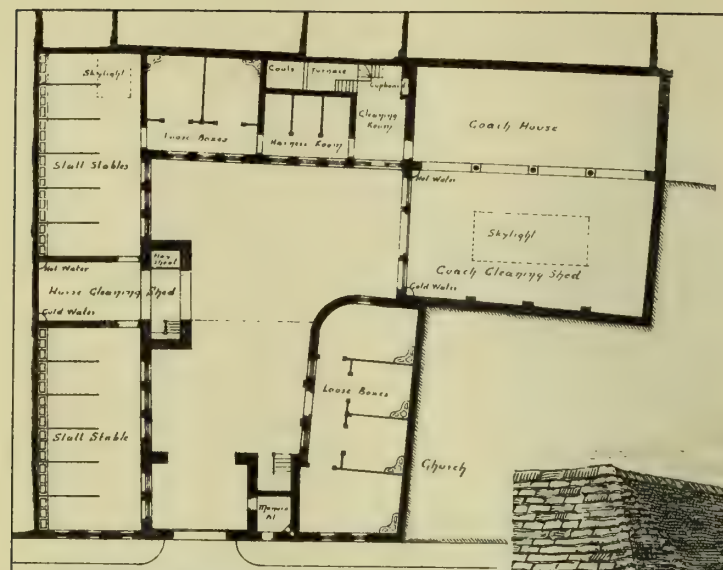


Photo Lithographed & Printed by James Akerman, 6 Queen Square, W C

New · Stables · Brick · Stree



ARK·LANE·W· FOR·THE·MOST·NOBLE·THE·MARQUESS·OF·LONDONDERRY.

JAMES BROOKS Architect .

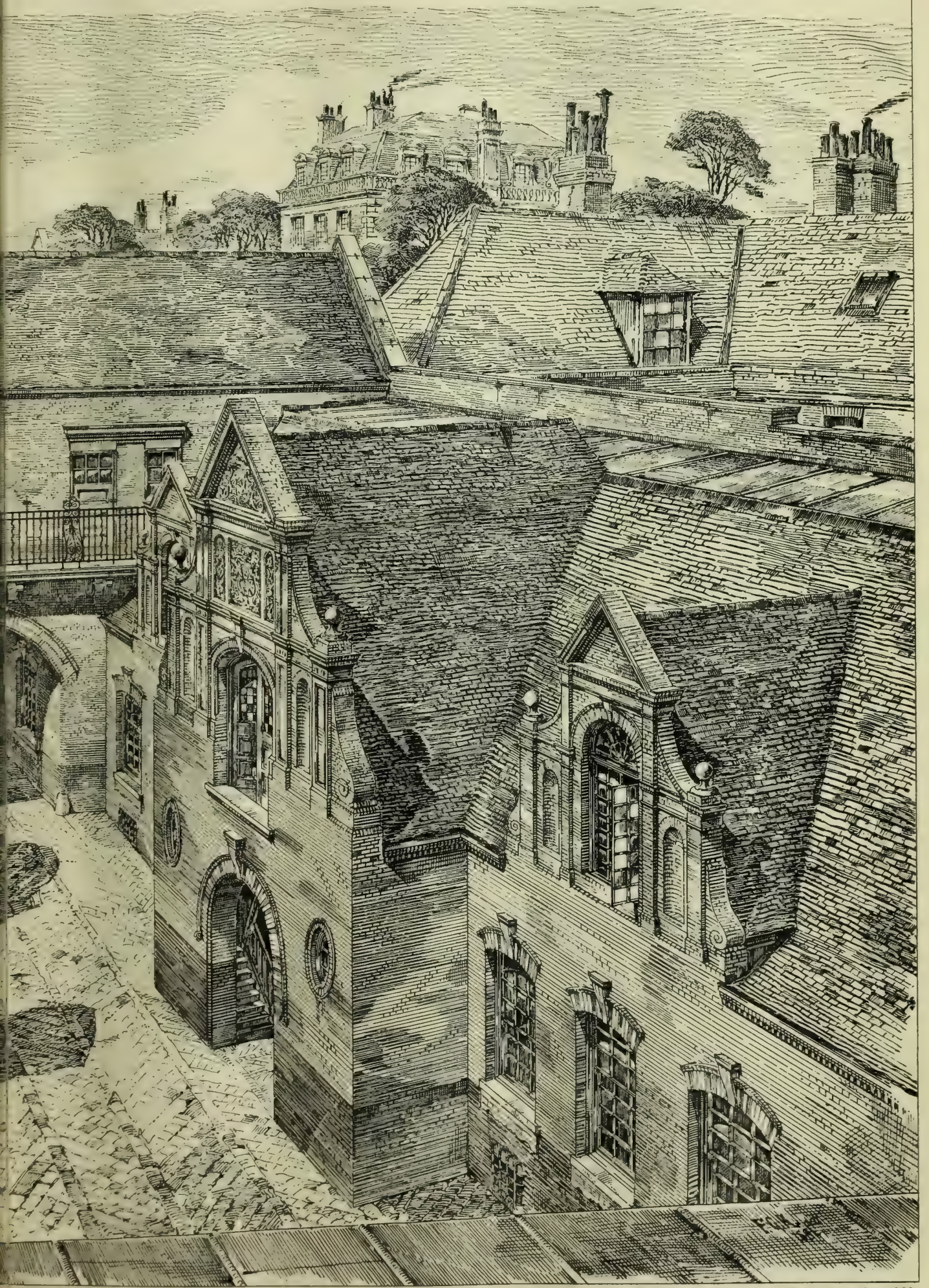
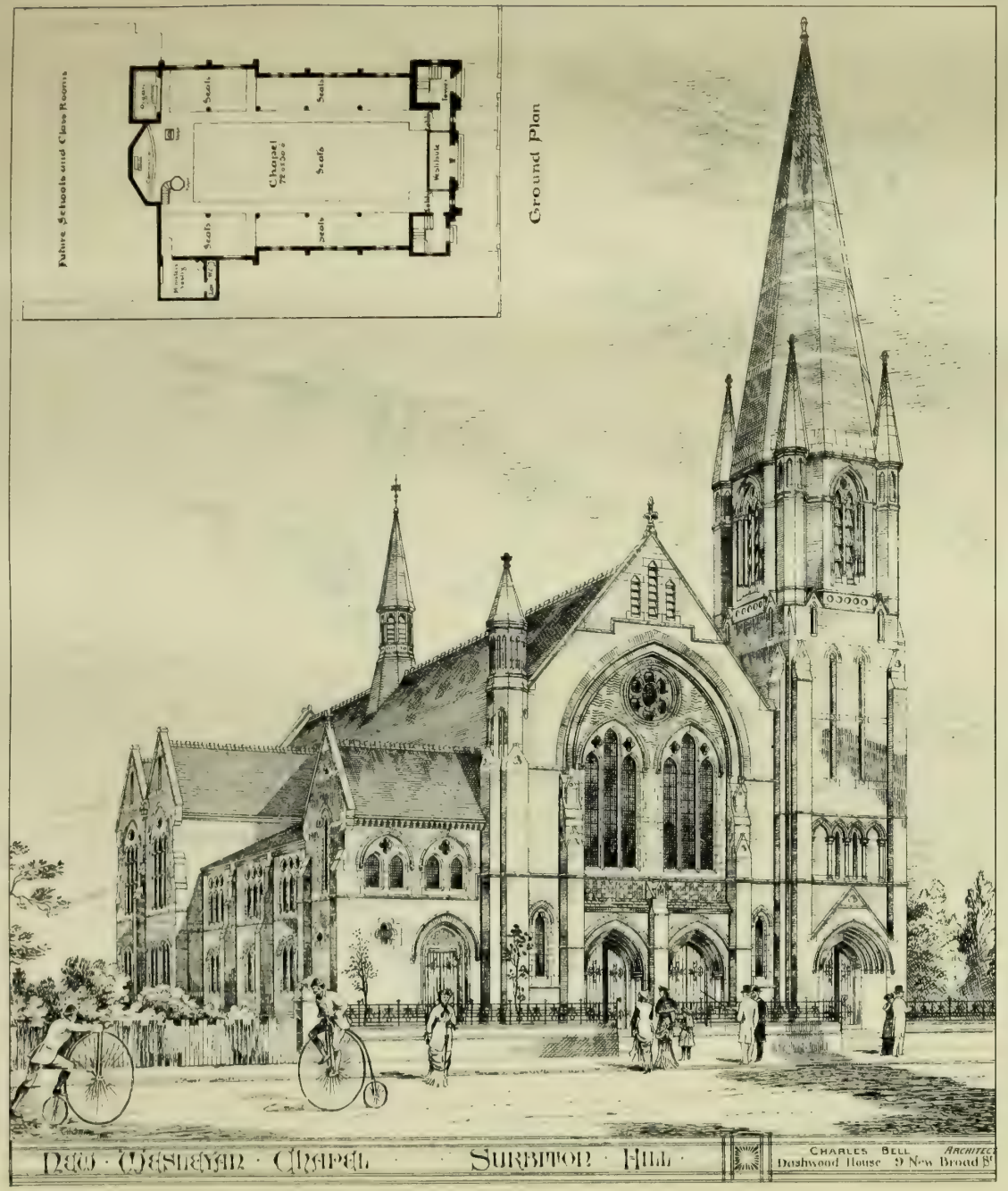
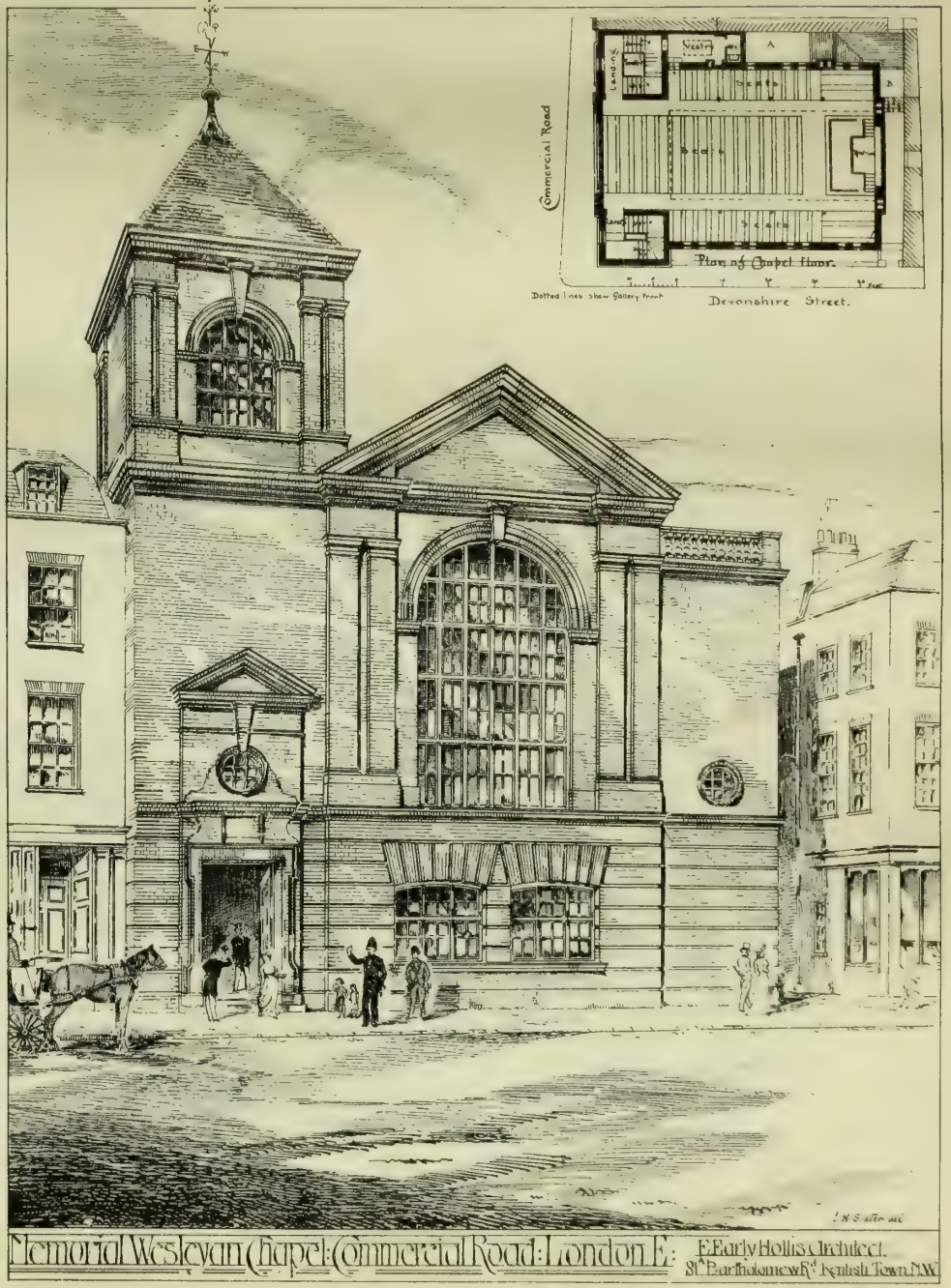


Photo Lithographed & Printed by James Akerman, 6, Queen Square, W.C.


Future Schools and Class Rooms
Ground Plan
Chapel Portion
Seats
Vestibule
Porch
NEW · WESLEYAN · CHAPEL · SURBITON · HILL ·
CHARLES BELL ARCHITECT
Dashwood House 9 New Broad St.


Commercial Road
Vestry
Landing
Plan of Chapel floor.
Dotted lines show Gallery front
Devonshire Street.
Memorial Wesleyan Chapel: Commercial Road: London E:
E. Early Hollis Architect.
St. Bartholomew Rd. Kentish Town N.W.

GARWAY · CHURCH
HEREFORDSHIRE

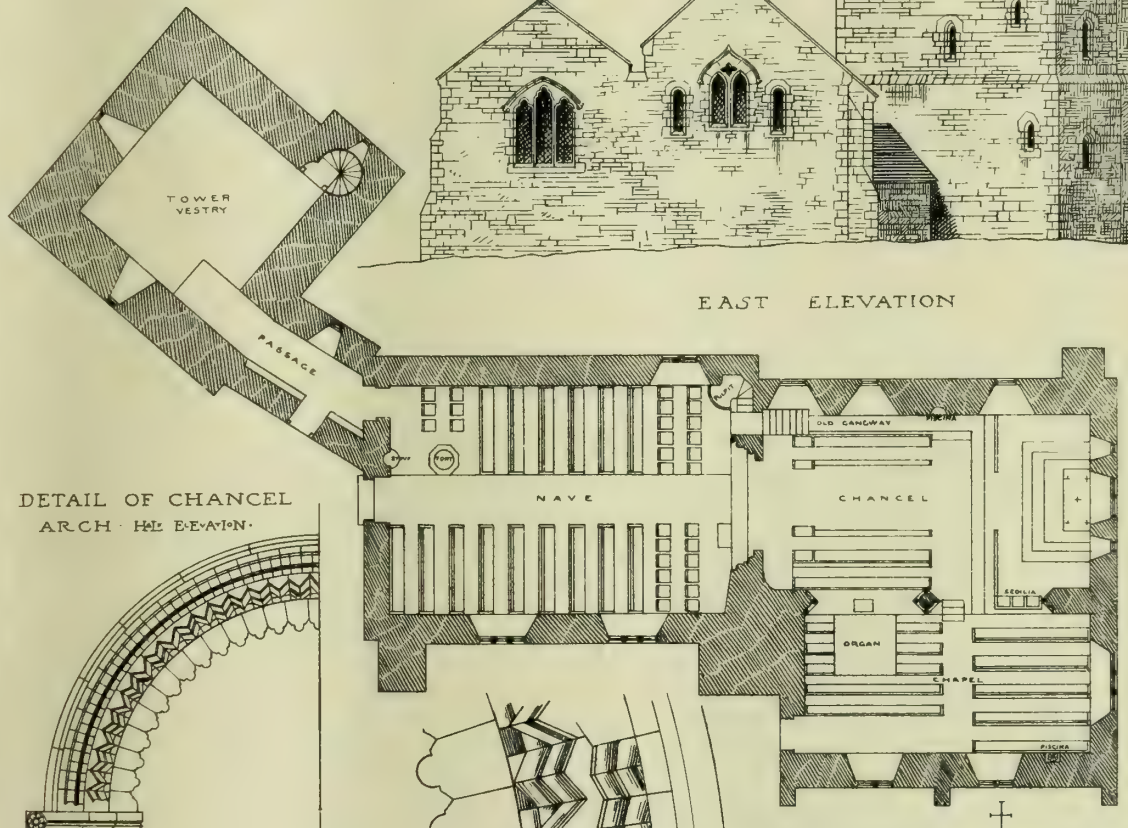
RESTORATIONS

E.H. LINCEN BARKER

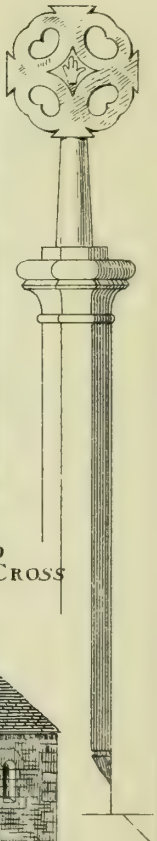
ARCHITECT

VIEW

EAST ELEVATION

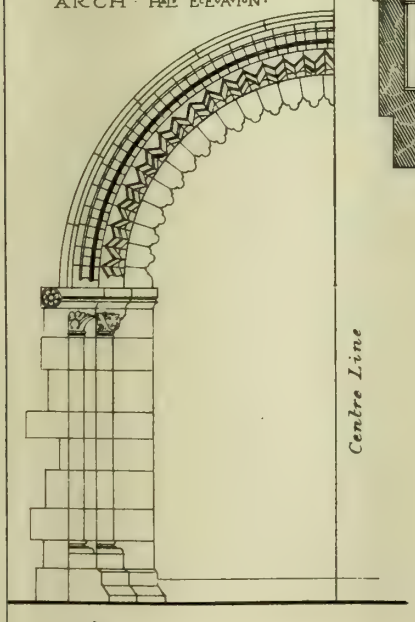


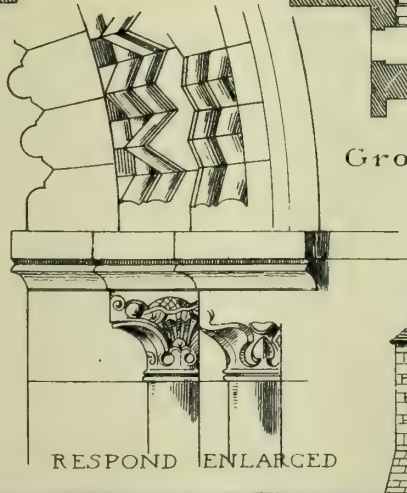
Ground plan



YARD CROSS

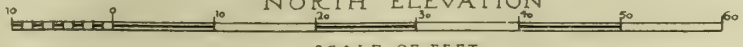
DETAIL OF CHANCEL ARCH · HALF ELEVATION ·





RESPOND ENLARGED

NORTH ELEVATION



SCALE OF FEET

MAURICE B ADAMS DELT

Photo Lithographed & Printed by James Akerman, 6, Queen Square, W C

THE PRESIDENCY OF THE R.I.B.A.

PROFESSOR STREET has been elected President of the Institute by 87 votes to 83. The result is satisfactory in itself, but there are still probably some people who think a good thing has been done not in the best possible way. The new President is unquestionably the first man in his profession. He is the architect of the best building of our generation, and he has exhibited in connection with that building, in addition to the genius required for its conception, an ability to modify his design in conformity with necessity without sacrificing its beauty, in a degree which few, if any, other architects have ever shown. Professor Street is, moreover, as admirable an exponent of his art as he is a master. His recent Academy lectures afford but an additional proof of the grasp he has of the questions affecting the welfare and dignity of architecture, and as President of the Royal Institute of British Architects he certainly brings to that body much more in the way of reputation than he is likely to get. It is certain, too, that a majority of his opponents at Monday's election would cheerfully acknowledge these facts. Why then, it may be asked, did they vote against him? Partly from an idea, which it must fairly be acknowledged had very good grounds to rest on, that they were bound, having assented to certain rules, to adhere to them; and partly from something like chivalry, which displayed itself in the letter of Mr. Burges, published in this journal, on the 1st of April, in which its lamented writer deprecated "making a set" at the other candidate. These considerations—most creditable in themselves, without doubt influenced many voters against Professor Street, who must in their hearts have felt much as Sarsfield felt after the capitulation of Limerick, when rallied by some of the officers in the English army, he exclaimed, "Only change kings with us, and we will willingly try our luck with you again!" The sentiment of the profession outside, regardless of smaller issues, undoubtedly was right on the main question. Architecturally, the contest was the Griffin against the Law Courts, and no one could doubt but that outside opinion would make itself felt within the Institute. Still, many people foresaw what the event has proved, that the struggle would be a close one, and that a candidate who, under ordinary circumstances, would probably have been supported merely by the officialism of the Institute and its connections, would attract much honest support rendered very unwillingly, not to him, but to the principle of which he was the representative. On the whole, we think Mr. Horace Jones may congratulate himself on the result. He has enlisted sympathy and support in quarters where its continuance could hardly have been possible, and in a contest with a man, so to speak, a head and shoulders taller than himself, made a much better fight than many men might have done who are more nearly the equals of the new President.

Professor Street has all his work before him if he is to make his mark as President of the Institute, as he has made it elsewhere. That he will in himself be a success we do not doubt; that he will attract some who have hitherto troubled themselves very little about the Institute and its doings, we hope and believe; that he will do much to widen the basis of the Institute, to extend its professional influence, and to bring within its control and capability of settlement the vital questions affecting the welfare of the profession, we hope, but doubt. If he is to do much, he must have the active support of the better class of Fellows and Associates. Such support is not rendered by non-attendance. We overheard one distinguished architect remark on Monday night that he had not been to Conduit-street for fifteen years, and another whose name is fairly well known, that he had been a member eight years, and had never been there before. Of course, if the members of any Society never go near it, never trouble themselves about its proceedings, and allow the management of its affairs to drift into the hands of the cliques which, under such circumstances, inevitably grasp the control of matters, they must not be surprised if things go on anyhow; if rules and regulations are made which bring about crises like the one just passed through, and which, however they may be surmounted, cannot improve the position of the Institute. That Professor Street's Presidency will attract the abler members of the Institute and the profession we believe; that the rival candidate, if he had been elected, would have done much to bring about improvement, or would have obtained the confidence of the men who wish to initiate it, we doubt; hence we are glad of the result. We trust that the contest may speedily be forgotten, and that Professor Street may be loyally recognised as President of the whole Institute, and not of a section or party, and that all may set themselves to work to bring about some of the reforms we have so often recommended, and which are necessary to the continued existence of the Institute, as the representative body of the profession.

ANNUAL GENERAL MEETING OF THE R.I.B.A.

THE annual general meeting of members only was held on Monday to read the minutes of the annual general meeting, held on Monday, the 3rd May, 1880; to receive and consider the report of the Council on the state of the property and affairs of the Institute; to elect the officers for the ensuing twelve months; and to appoint the Board of Examiners under the Metropolitan Building Act, 18 and 19 Vict. c. 122, s. xxxiii.

Professor G. E. Street, R.A., who was proposed by Mr. James Brooks, and seconded by Mr. Martineau, received the votes of the majority for President, leaving the Council's nominee, Mr. Horace Jones, with a substantial minority, the number of votes for Professor Street being 87, and for Mr. Jones 83. At the opening of the meeting, Mr. Whichcord, the outgoing President, occupied the chair, and the report of the Council for the past year was taken as read. Professor Donaldson, in an admirable speech, proposed a vote of thanks to Mr. Whichcord, and this was briefly seconded by Mr. Charles Barry. The voting for the President was then proceeded with, and while the scrutineers were making their examinations of the election papers, a smart passage of arms occurred between Mr. James Fowler, of Louth, Mr. Charles Barry, Mr. J. P. Seddon, and Mr. R. W. Edis. This display of feeling was unintentionally originated by Mr. Arthur Blomfield, who said plainly, but in moderate terms, that those who had acted with him in furthering the election of Mr. Street had not consulted him before printing the final circular of Saturday's date, which included him with others as among those who would support proposals for the amendments of the existing by-laws, and he regretted they had thus used his name. The timely announcement of Mr. Street's election speedily put an end to this squabble. The re-election of Professor Lewis, Mr. Horace Jones, and Mr. Ewan Christian as vice-Presidents was then unanimously agreed to, and the voting for the new Council, a tedious undertaking, was proceeded with. Mr. MacVicar Anderson was re-elected by acclamation as Hon. Secretary, and Mr. W. H. White, on the motion of Mr. Whichcord, seconded by Mr. Charles Barry, was re-elected as paid secretary. Mr. Ouvry was also re-elected as solicitor to the Institute. Messrs. Wyatt Papworth and T. M. Rickman were appointed auditors. Professor Street, R.A., the new President, arrived at this period of the proceedings, and was received with several rounds of hearty applause, chiefly from the ordinary members. Mr. Whichcord at once left the chair in favour of Mr. Street, handing as he retired the chain of office to Professor Donaldson, who immediately placed it round the neck of the new President, remarking as he did so, that he hoped all discord and division would now cease, and that the history of the Institute, under the rule of Prof. Street, would be one of continued prosperity.

Mr. Charles Fowler next drew attention to the new way of reporting and issuing the proceedings of the meetings, and took objection to the change which had taken place. He expressed a desire to know whether the abstracts of the proceedings, at present received on Thursdays after the meetings, were to be bound with the volume of the *Transactions* which they are promised at the end of the year? The Secretary said that as reports of the meetings appeared in the professional journals on Fridays, it was thought desirable that the official proceedings should be in the hands of members by Thursday night, and it was impossible to do this if the papers were to be printed in full at the same time, because the time allowed for members to correct and amend the official full report of their speeches was not sufficient. Several other speakers endorsed Mr. Fowler's remarks, and urged that while the time at their disposal from week to week probably allowed them to read the single copy of the *Transactions*, a large volume of over 300 pages at the end of the year would never be read at all. Mr. Edis also pointed out that several papers, such as the last read before the Institute—viz., on "Electric Lighting," would in six months' time be of very little value or interest to members, however useful it might be at the present moment. The President agreed with the last speaker, and said that the Council would give the objections to the present system their best attention. Mr. MacVicar Anderson, Hon. Sec., urged that the new mode of publication had not been tried sufficiently long to warrant the objections to it which had been made. The meeting, however, was evidently not convinced by these remarks.

The following is the list of the new Council for the ensuing year, from which it will be seen that two new names have been introduced, viz., Mr. James Brooks, and Mr. Edward Graham Paley, of Lancaster:—

Blomfield: Arthur William, M.A.
Brandon: David, F.S.A., Past Vice-President.
Brooks: James.
Cates: Arthur.
Clarke: Joseph, F.S.A., Past Vice-President.
Currey: Henry, Past Vice-President.
Gibson: John, Past Vice-President.
Hansard: Octavius.
Honeyman: John (Glasgow).
I'Anson: Edward, F.G.S., Past Vice-President.
Knowles: James Thomas.
Paley: Edward Graham (Lancaster).
Vulliamy: George, Past Vice-President.
Waterhouse: Alfred, A.R.A., Past Vice-President.
Worthington: Thomas (Manchester).

Of the past Council, Mr. Octavius Hansard attended all the Council meetings, which numbered thirty during the past year, Mr. J. T. Knowles 29, and Mr. Arthur Cates a similar number. Mr. Henry Currey attended 25, and Mr. Joseph Clarke 24 times. Mr. John Gibson, on account of ill-health, had only been present twice, and Mr. George Vulliamy only once; but this was accounted for by his having to be present at the Board of Works on Mondays, the day the Council meetings are held.

The meeting separated shortly before midnight.

THE GLASGOW MUNICIPAL BUILDINGS COMPETITION.

MR. CARRICK, the City Architect, submitted, on the 5th inst., at a meeting of the Town Council of Glasgow, new sketch-plans of the proposed municipal buildings in George-square, with an accompanying explanatory report, and there was at the same time laid before the Council a memorandum of conditions which the special committee on the subject recommended for adoption in the new competition. In the difficult position in which he was placed, Mr. Carrick has sought to steer a middle course, in the hope, no doubt, of reconciling conflicting views. As we anticipated, he has found it impossible on the restricted space to make provision for an art-gallery in connection with the buildings, except in the attics at a height of some 50ft. from the ground, and therefore this portion of the scheme is delayed; but he suggests that "the saloons and reception-rooms, with the spacious lobbies and staircases," will, in time, possess the attraction of pictures, sculpture and other works of art. It can scarcely be expected that this sorry makeshift will satisfy

those who desire to see Glasgow take rank along with the other cities of the Empire as a centre of art influence, though possibly they may find it inexpedient to press the matter further, at least in the mean time. "The new plans," Mr. Carrick says in his report, "differ in many respects from the former sketch-plans, but do not interfere materially with the relative positions of the several departments of the public service for whose accommodation the scheme was originated. The principal alterations are in the situation of the council-chamber, which is placed so as to front George-square, and in the internal arrangements of the portion of the buildings fronting John-street. These arrangements will admit of the formation of an internal quadrangle of considerable extent, which will be approached from George-square by means of a spacious opening similar to the entrance to Somerset House from the Strand; or to the foreign offices erected in Westminster from the designs of the late Sir Geo. Gilbert Scott. Means of communication with Cochrane-street and George-street are likewise provided, the latter being of a subordinate description. The size of the quadrangle and the openings into the surrounding streets will secure the most perfect means of light and ventilation, and should be sufficient to satisfy the 'air hunger' of the most advanced sanitarian." The buildings will be four stories above the level of the surrounding streets, or something like 70ft. or more in height. The first two floors are appropriated to the following departments—viz., the Offices of the Town Clerk, the Finance Department, the Gas and Water Departments, the Offices of the Clerk of Police, the Public Works Department, and the apartments of the Medical Officer. The third floor, being the second from the level of the street, is dedicated to the accommodation of the Town Council. The Council-chamber is in the centre, fronting George-square, and with the Lord Provost's room, refreshment buffet, library committee-room, and apartments in connection, will occupy the whole frontage to the square. The Committee-rooms, of which there are five, are in the portion of the buildings fronting Cochrane-street. The hall, with the two adjacent saloons, occupy the whole of this part of the buildings fronting George-street. Access to the whole buildings is provided by means of four staircases, two entering from George-square, one from John-street, and one from the Quadrangle, all spacious and easy of ascent. With regard to the conditions of the competition as recommended by the committee, they seem to be conceived in a broader and more liberal spirit than those under which the former plans were prepared, and to be substantially in accord with the suggestions of the London and Local Institutes of Architects. Briefly stated, the conditions are that there shall be a preliminary competition open to all; that from the competitors taking part in it not fewer than six, and not more than ten, shall be selected by an architect-assessor, or assessors previously appointed for the final competition. Plans of the internal arrangements, as designed by Mr. Carrick, will be submitted to competitors as showing the general accommodation required; but each competitor is to have full liberty to suggest such disposition of the whole internal arrangements as he may think best. No restriction is imposed as regards the style of architecture; but a preference will be given to Classic of a broad and dignified, rather than of a florid character, and the cost of the entire structure, including architectural embellishments, but excluding painting and furnishing, is to be about £250,000. In respect of cost and also of the freedom given to competitors in regard to external style and internal arrangement, there is thus an important alteration on the conditions of the former competition. With reference to the execution of the work also, the conditions are drawn in a more judicious spirit. Each of the selected competitors in the final competition shall, it is provided, receive £150 to cover the expenses of the designs. From the designs lodged in this competition, four shall be selected by the Magistrates and Council, with the advice of the architect-assessor, or assessors, and the author of the first design is to be employed to execute the work on the usual professional terms of remuneration, unless any insuperable obstacle prevents such employment, in which event the author of the second, third or fourth designs in order. A better arrangement possibly would have been that the architect-assessor, or assessors should have had absolute power in the selection of the design to be adopted; but this is perhaps more than could be expected of municipal human nature, especially as it exists in the city of Glasgow. Before the Council entered on the consideration of the report, Bailie Wilson, a prominent member of the Board, gave notice of a motion to the effect that the task of preparing the plans should *per saltum* be entrusted to Mr. Carrick, the City Architect, who should be relieved of all his other duties and be empowered to call in whatever professional assistance he required in the matter. That the members should have time to consider this somewhat extraordinary proposition, it was suggested that an adjournment should take place for a fortnight. Several gentlemen indicated that, without any very protracted delay, they were prepared to pronounce on Mr. Wilson's solution of the problem, which has so long exercised the minds of the Council; but it was in the end agreed that an adjournment should take place for a fortnight or three weeks, to allow of reduced lithographs of the sketch-plans being prepared for the use of the members. What the result may be it is scarcely possible to predict. The Committee are hopeful that they will succeed in carrying their scheme as now adjusted; but there is a strong antagonistic element in the Council, and it is to be feared there will still be further wrangling and more delay.

THE MANUFACTURE OF GLASS FOR DECORATIVE PURPOSES.

A PAPER was read on Wednesday, by Mr. H. J. Powell, before the Society of Arts, on the manufacture of glass for decorative purposes. The subject was divided into three parts:—1. The development for decorative purposes of the natural properties of glass; 2. The production of decorative forms, or decorative material, by the manipulation of glass in a plastic or viscous condition; 3. The treatment of the surface of glass with a view to supplement the effects due to its form or its nature. Having described the nature of glass, the author went on to point out that the effects produced respectively by the refraction, transmission, or reflection of light by glass may, in many cases, be utilised for decorative purposes. If a beam of light be transmitted through a glass prism or lustre, a more or less extended spectrum is formed in proportion to the density of the glass. If a beam of polarised light be transmitted through a plate of glass in a condition of unequal tension, black and coloured figures become apparent. If white light be transmitted through glass containing the oxide of uranium in solution, rays otherwise unseen become brilliantly conspicuous. If certain metallic oxides be introduced into a crucible, together with the mixture for transparent glass, and be dissolved throughout the mass, the resultant glass acquires the power of sifting the incident rays, and of transmitting effects of colour according to the nature or quantity of the oxide introduced. Different permanent transmitted colours are obtained (1) by the oxides of different metals, (2) by the different oxides of the same metal, (3) by different quantities of the same oxide, or by different thicknesses of the resultant glass. The characteristic colours of the oxides of gold, silver, copper, manganese, iron, and cobalt are, respectively, pink, yellow, peacock-blue, violet, dull green, and purple-blue. Copper and iron possess two oxides each, namely, a peroxide containing a large proportion of oxygen, and a sub-oxide containing a smaller proportion. The peroxide of copper gives a blue or green colour, and the sub-oxide a ruby red. The peroxide of iron gives a yellow, and the sub-oxide a dull green. Certain oxides are valuable for their power of respectively increasing or diminishing the oxidation of other oxides. Thus to obtain an iron yellow, which is the characteristic colour of the peroxide of iron, it is necessary to add to the mixture oxide of manganese, which, at a high temperature, parts with its oxygen and its colouring power simultaneously. The oxygen thus set free goes to the assistance of the peroxide of iron, which has a tendency to part with its oxygen, and to produce a green colour. The sub-oxide of copper has a great tendency to rob oxygen from any convenient source, and to produce a blue or green, instead of a red; it is therefore necessary, when a red is wanted, to mix with it some substance which absorbs oxygen with greater avidity. The oxide used for this purpose is the sub oxide of tin. Glass, in addition to holding oxides in solution, may also hold them, as well as metals and other substances, in suspension. It often happens that in preparing the quick from the oxide of gold and red from the oxide of copper, the reductive action is carried too far, and instead of having the oxide in solution, the metal is found suspended in the glass in a state of extremely fine division. The glass in this condition reflects a red colour, but transmits an opalescent blue. If the particles of the metal be sufficiently large to reflect light, and with it the characteristic colour of the actual metal, the well-known effect of avanturine is obtained. The different colours produced by the same oxide are best observed in the case of copper and cobalt. A small quantity of the per-oxide of copper gives a blue, and a larger quantity a green. In the same way a strong dose of the oxide of cobalt gives a red, a smaller dose a violet, and a comparatively minute quantity the characteristic blue, or a thick layer of cobalt glass transmits red rays; a thinner layer, violet rays; and a still thinner one, blue rays. Opacity may be produced by devitrification, by the semi-fusion of pulverised white or coloured glasses, and by the addition to transparent glass of some infusible material. Devitrification has never been pressed into practical use; the semi-fusion of pulverised glass places at the decorator's disposal a material of great strength, possessing a granular and irregular surface, together with the power of developing almost every tint of colour in an absolutely permanent condition. The process is also valuable to the manufacturer as supplying a means utilising water. Opaque black glass or black enamel is formed by the addition to transparent glass of an excess of an infusible or partially fusible black oxide, as, for instance, that of iridium, of cobalt of manganese, or of iron. White and coloured enamels owe their opacity to the oxide of arsenic, the oxide of tin, the phosphate of calcium, or to cryolite, a compound of sodium, aluminum, and fluorine, and their colours to different metallic oxides. It is cryolite which gives the opacity to the well-known hot-pressed porcelain.

The molten glass gathered on the end of the hollow blowing iron may be placed in a mould, and by the pressure of a workman's breath on its inner surface, may be forced to adapt both its internal and its external surface to the form and surface of its environment. By this means the glass may not only receive the actual form of the interior of the mould, but may also be imprinted by any depressed or raised ornament, wrought on its inner surface. If instead of being expanded by the workman's breath it be forced to adapt itself to the mould by the descent of a plunger, it will assume on its outer surface the internal form of the mould, together with any decoration which may be wrought upon it, and on its internal surface the form and surface of the plunger.

The molten glass may also be fashioned by the breath and the simple tools of the glass-blower. The arms of the chair in which the workman sits, and the hollow and solid rods by which he holds and rotates his blower-glass with his left hand, constitute the entire mechanism of his lathe or throwing-wheel. His principal tools are what may be called the sugar-tong spring tool, the shears, the battledore or flattening tool, together with a variety of simple clips, measure sticks, and callipers. However simple the tools may be, the variety of form which a blown bulb may be forced to assume is inexhaustible. The molten glass, when gathered from the crucible, is too fluid for immediate manipulation, and requires to be partly solidified by rolling on a polished iron slab, or by insertion in moistened woollen cup-shaped moulds, from which the glass may assume a rough outline of its ultimate form. The first process in every case is blowing through the hollow gathering iron until the mass of glass be expanded into a bulb. If the iron be held vertically, with the bulb downwards, the bulb is elongated by gravitation, and expanded at the same time; if the bulb be raised and blowing be continued, it increases in circumference only. The bulb may also be elongated by gravitation alone, assisted by a swinging motion. Whilst the bulb is being shaped with the spring tool, it must be kept in constant rotation by rolling the rod, to which it is attached upon the arms of the chair, as other-

wise it would collapse. If the end of the bulb remote from the blowing iron be opened, and the bulb be rapidly rotated and heated simultaneously, it will suddenly be opened by centrifugal force into a flattened disc. If the disc be re-heated, and the iron held perpendicularly with the disc downwards, the disc will gradually crumble and collapse. The heat required to renew the plasticity of glass essential to manipulation is obtained by inserting the bulb or vessel into the mouth of the heated crucible, or into a furnace adapted to the purpose. If to the end of a solid mass or hollow bulb of glass a second working rod be attached by a seal of glass, and the workman recedes whilst retaining the blowing-iron, and an assistant recedes carrying the second rod, the bulb or mass which unites them may be indefinitely extended. If a connection be formed between a source of molten glass and the circumference of a heated wheel, and the wheel caused to revolve with speed, a thread is coiled upon the wheel in an extreme state of tenuity. This thread may be spun into a decorative fabric.

Various specimens of glasswork were exhibited by Mr. Powell in illustration of his remarks.

A VISIT TO MR. LASCELLES' WORKS.

THE visit paid last Saturday afternoon by the Architectural Association to the workshops of Mr. W. H. Lascelles, in Bunhill-row, was both of an instructive and interesting kind, for the members had an opportunity, not only of witnessing the operation of many very ingenious wood-working machines, but of examining specimens of finished joinery and various applications of Mr. Lascelles' red concrete, a material which seems destined sooner or later to take its place among the more durable substances the architect can employ. Commencing on the ground-floor of the factory, each successive floor of Mr. Lascelles' extensive building was taken in order. The moulding cutting-machine attracted considerable attention. Pieces of rosewood were passed through the machine, and came out delicately moulded with ogees, hollows, and fillets of remarkable sharpness. The machine is by Robinson, of Rochdale. Another specimen of moulded work was a cornice in a beautiful yellow Canadian wood, the members of which were singularly clean. To show the value of machine labour in performing operations requiring mechanical exactness, some lengths of school-desk were drilled by holes for the ink-bottles, and their ends cleanly cut to a certain length by a cross-cutting and boring-machine adapted by Mr. Lascelles, in which the chief peculiarity is the form of the teeth of the circular-saw. Every tooth in the wheel is cut in the form of a lancet, and these are arranged on the opposite faces of the metal alternately, the effect of which is that the wood cut through has all the cleanness, finish, and polish of a planed piece of work. Another very ingenious little rotary machine was set to work in mouldings sunk from the surface of the wood. This is chiefly employed in working circular countersunk mouldings. A very fine delicate moulding was turned out in mahogany, all that was required being resting the piece of wood on a table, and pressing it by the hand against a circular band which can be raised or lowered, and within which is a rapidly revolving spindle with the tools fixed in it. By this means the manipulator can run a moulding on a piece of wood of any curvature or degree of straightness, but its chief use is obviously for circular work.

The American system of drying timber is used by Mr. Lascelles, the principal feature of which is that there is no outlet, the room being quite airtight, and the vapour being condensed on a series of cold-water pipes. It is an excellent plan of drying. Proceeding to the first floor, chiefly occupied in glazing and in packing, the process of bending ribs for horticultural roofs was seen; the moulded rib having been placed in a long steam-pipe, and kept in it for 20 minutes, was quickly pulled out and bent round a large horizontally-placed template or frame of timber, and kept in position by a radial clip. In this manner the pieces composing the bar or rib were glued and nailed together, and when taken off it was found to be perfect in form. On the second floor a door-cramp that had been in use 15 years and an American sawing-machine, which in its work leaves the wood like a plane, and a grooving and rebating machine were inspected. A very cheap kind of panelled oak dado, by Mr. Cousens Smith, is formed of matchboards behind, faced with a veneer on which are planted moulded pieces with bosses at the corners. It is equally adapted for ceilings. On the third floor various specimens of joinery drew attention, excellent examples of clean finished work. The doors and other framed work for a house at Queen's-gate were examined with some interest, of which the dado architraves form a capital finish for the members of the dado cornice. A summer-house, executed with open framing filling-in, a sort of Japanese trellis; some cheap and effective picture-frames machine-made, and a garden shelter, like a huge umbrella, which can be opened and closed, drew attention. On the upper floor a number of London School Board desks, with the front part of desk made hinged so as to fold back when not in use, was one of the chief works examined, and Mr. Lascelles has been probably the largest manufacturer of these desks. The value of machinery in the production of park-seats was clearly seen, as the laths can be cut by machinery to any length and curve required to form the rounded seat and back.

But an account of the visit would be very imperfect without a reference to the concrete manufacture, which is a very important speciality of Mr. Lascelles' business. The association went through several rooms of these, but we can only name a few of the more important and recent manufactures of special value to the architect. The red paving slabs appear to be excellent substitutes for clinkers, more even and better as a surface, and quite as durable. They have been laid at Finsbury, and the price varies from 4d. a foot for slabs 1½in. thick, and 6d. a foot for 2in. slabs. A specimen of Potter's concrete slab-faced wall filled in with concrete, and having a moulded coping of the same material of a deep brick red colour, was examined by many present with attention. The lining slabs, at 3½d. per foot for horticultural purpose, are a capital substitute for wooden shelves which are constantly rotting and requiring painting; the water-channel slab is another useful application of the red concrete; but architects will appreciate most of all the combined coping, cornice and gutter of moulded red concrete for the protection and capping of walls and façades. This massive casting is made deep enough in section to form a plate for the rafters as well as a sunk gutter, while the moulding or upper member of the cornice is made to boldly project, and can be built over brick or moulded courses to form a cornice of considerable projection. Its advantages over stone are obvious: it is imperishable, as the sunk gutter, does not require lead lining like stone would; the material is cast in long lengths, and its hardness and durability make it, in every way, suited as a wall-covering. The concrete column, in which red concrete shafts have been introduced round the centre marble pillar, in St. John's Church Berkeley-square, by Mr. Blomfield, shows the value of concrete as a material capable of standing immense pressure; and here we would refer to the above tables of tests of Mr. Lascelles' concrete, made by Mr. D. Kirkaldy, which show that at 4 months old the concrete stood a test of 93 tons to the foot before crushing; at 16 months old the concrete stood 130 tons to the foot, with a certain proportion of cement to breeze. An egg-shaped sewer, made of segments of this material grooved together, is another of the attractions. Mr. Lascelles, however, has not forgotten the artistic capabilities of the material, and the very effectively-designed chimney-pieces in the Queen Anne style, call for particular mention. For cottage building, upright studs, with slabs of concrete, or "rough cast" on the outer face and plaster inside, make a cheap wall, and we are glad to find an attempt made to panel the outer wall-face. The hearth-tiles, inlaid with brass, are a new and pleasing mode of cheap paving; but we cannot afford space to recount the variety of new things which skill and enterprise can make in concrete, and which need not shock the most æsthetic-minded.

Results of Experiments to Ascertain the Resistance of Thrusting Stress of Nine 2-inch Concrete Cubes Received from W. H. Lascelles, Esq.

Test No.	Description.	Dimensions.	Base Area.	Cracked slightly.			Crushed, Steelyard dropped.			
				Stress.	Per sq. in.	Per sq. ft.	Stress.	Per sq. in.	Per sq. ft.	
P		Inches.	Sq. in.	Lbs.	Lbs.	Tons.	Lbs.	Lbs.	Tons.	
1703	D	2·03 2·00 × 2·00	4·00	19,162	4,790	308·0	19,162	4,790	308·0	Net cement made on Dec. 15, 1860.
1704	do.	2·03 2·00 × 2·00	4·00	18,628	4,657	299·4	18,628	4,657	299·4	Do.
1702	C	2·00 2·00 × 2·00	4·00	16,298	4,074	261·9	16,298	4,074	261·9	Net cement made March 8, 1881.
1697	X	2·00 2·00 × 2·00	4·00	12,982	3,245	208·6	12,982	3,245	208·6	Made of 3 of cement to 10 of breeze, Jan. 18, 1881.
1696	do.	2·00 2·00 × 2·00	4·00	12,248	3,062	196·9	12,248	3,062	196·9	Do.
1699	A	2·00 2·00 × 2·00	4·00	8,488	2,122	136·4	8,488	2,122	136·4	1 of cement to 4 of breeze, Jan. 1, 1880.
1698	do.	2·00 2·00 × 2·00	4·00	8,023	2,006	129·0	8,023	2,006	129·0	Do.
1701	B	2·00 2·00 × 2·00	4·00	5,838	1,459	93·8	5,838	1,459	93·8	1 of cement to 4 of breeze, Jan. 1, 1881.
1700	do.	2·00 2·00 × 2·00	4·00	5,796	1,449	93·1	5,796	1,449	93·1	Do.

Bedded between pieces of pine §in. thick.

THE CONTENTS OF GREEK MONUMENTS.

PROFESSOR C. T. NEWTON, C.B., of the British Museum, delivered on Friday afternoon, in the lower theatre, University College, the first of a course of eight lectures on the sepulchres, monuments, and games of Ancient Greece and Rome. He proposed to treat these subjects chronologically rather than geographically, and to comprise within his survey the whole period of Classic history from the days of Homer (whenever that might be) to the decay of the Roman Empire. Opening his subject by a quotation from Cicero's description of his rediscovery, about 75 B.C., of the neglected tomb of Archimedes at Syracuse, Mr. Newton gave in this first sketch a general view of the Greek memorials of the dead of that period. These were not gathered into dismal cemeteries, but were scattered over the country—those commemorative of a naval victory on a promontory, those of a battle on the field itself, those of mythic founders of cities in the agoras, those of philosophers in their gardens. These monuments were often sculptured with an emblem of the trade or profession, and a few words concerning the deceased; that of Archimedes already alluded to was identified by Cicero by the sphere and cylinder engraved on it, and he afterwards cleared and read the lines of the epitaph which had become obliterated by the growth of weeds. The ruling idea in making these monuments was to provide a house for the dead, suitably furnished for its ghostly tenant, with a child-like pseudo-logic or make-believe as to the value of these material adjuncts to the shades of the departed which was paralleled in almost every Eastern nation—Egyptian, Greek, Etruscan, Roman, Indian, and Chinese of every degree of culture, from the deepest barbarism to highly civilised and refined. Our chief knowledge of Greek art was gathered from these remains; indeed, almost all the Greek remains in our principal European museums, with the exception of the larger sculptures, were treasures recovered from the tombs. The character of these remains varied according to the piety, the wealth, and the ostentation of the friends or fellow-citizens of the deceased. From

Classic literature and from the modern discoveries, we knew that with warriors were often buried their weapons. In those of ladies were the *kosmos*, which included tires, necklaces, earrings, slippers, rouge, and instruments for painting the eyelids. In children's tombs terra-cotta toys were frequent, and in graves of all sorts actual food, many unbroken eggs having come down to this day. Cooking instruments of bronze were common, and very many works of art of fictile materials, on which were represented mythological stories. It was common also to find incantations, threatening eternal tortures on those who should disturb the remains. In Augustus' time there was a temporary interest taken by cultivated men in the contents of Greek tombs at Corinth and elsewhere opened out by the engineering works of the Romans, but it speedily died out and did not revive till the 14th century. In the mean time all objects recovered from tombs during that long interval were valued only at their intrinsic worth, and had been irrecoverably lost. It was curious to note that of Roman art we had found scarcely any examples; of earthenware urns there were specimens by the thousand, but nothing of more interest except porphyry vases. The great and magnificent series of tombs in the Appian Way at Rome were long ago rifled of their contents.

COMPETITIONS.

Colchester.—For the proposed additions to the Eastern Counties Asylum for Idiots, nine sets of designs were sent in, and that of Mr. Valance, of Mansfield, Notts, has been accepted. No premiums were offered, but the work is to be put into the hands of the successful architect.

CHIPS.

The Committee of the Junior Carlton Club have unanimously approved of a bust of Lord Beaconsfield by Mr. Belt, and have commissioned him to execute it in marble for the club.

At a general assembly of the Royal Academy, held last week, Mr. Briton Riviere and Mr. Walter William Ouless, painters, were elected Royal Academicians, and Mr. Thomas Oldham Barlow a Royal Academician Engraver.

The Bognor local board have applied to the Local Government Board for a loan for the purchase of the "Jubilee School" premises, and instructed their surveyor, Mr. H. W. Stringfellow, to prepare the necessary plans for converting the same into public offices.

We are desired by Mr. H. Stannus to say that whatever blame attaches to the selecting and editing of the programme for the soirée of the Architectural Association is due entirely to him, and that Mr. H. D. Appleton is entirely free from any complicity in it.

The parish-church of Broughton, near Newport Pagnel, has just received an addition in the shape of a carved oak eagle lectern, designed by Mr. William White, F.S.A., architect, of 30A, Wimpole-street, W., London, and the handiwork of Mr. Harry Hems, of Exeter.

The last section of the granite for the Eddystone Lighthouse has just been fitted and despatched from the De Lank granite quarries, near Bodmin, and it is expected the tower will be completely set upon the rock before a month is over—fully six months before the contract time.

The Archbishop of Canterbury, on Saturday, reconsecrated the enlarged church of St. Mary, Plaistow, a new chancel, organ-chamber, and vestries having been added from the designs of Mr. W. R. Mallett, architect.

The corporation of Hull have accepted the tender of Mr. J. Pearson, a local contractor, at £14,010 for the reconstruction of the Victoria-pier at the Ferry-Boat Pier. Mr. J. Fox Sharp, the borough engineer, has prepared the plans, and seven tenders were received.

The foundation-stone of a new R.C. church at Guildford was laid on Wednesday by Cardinal Manning. Mr. E. Ingress Bell is the architect.

Messrs. Thomas Robinson and Son, Limited, Railway Works, Rochdale, have just learnt by telegram from Melbourne, that in addition to the three highest awards already granted them at the Exhibition there, they have been awarded, on the special recommendation of the jurors, "The Commissioners' Gold Medal" for the superiority of their exhibits of steam-engines and wooden cutting machinery over others of the same class.

A Hundred Thousand Replies and Letters on subjects of Universal Interest have appeared during the last ten years in the ENGLISH MECHANIC AND WORLD OF SCIENCE, most of them from the pens of the leading Scientific and Technical Authorities of the day. Thousands of original articles and scientific papers, and countless receipts and wrinkles embracing almost every subject on which it is possible to desire information have also appeared during the same period. The earliest and most accurate information respecting all new scientific discoveries and mechanical inventions is to be found in its pages, and its large circulation renders it the best medium for all advertisers who wish their announcements to be brought under the notice of manufacturers, mechanics, scientific workers, and amateurs. Price Twopence, of all booksellers and newsvendors. Post free 2½d. Office: 31, Tavistock street, Covent-garden W.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

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The charge for advertisements is 6d. per line of eight words (the first line counting as two). No advertisement inserted for less than half-a-crown. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

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Mr. Charles Wilson, of 13 and 15, Laight-street, New York City, is authorised to receive American subscriptions at the rate of 6 dols. 40c. per annum.

Mr. R. M. Tuttle, of Titusville, Penn., U.S.A., is also authorised to receive subscriptions at the same rate.

Cases for binding the half-yearly volumes, 2s. each.

NOW READY,

Handsomely bound in cloth, Vol. XXXIX. of the Building News. Price Twelve Shillings. Order at once, as only a limited number are bound up.

N.B.—Cases and vols. must be ordered through a bookseller or newsagent, as the regulations of the Post-office prevent them from being sent by post.

Received.—C. E. J.—M. Ry. Co.—F. M.—R. J. C.—R. M. and Son.—T. H. C.—C. Bros.—J. G.—W. H. L.—E. S. H.—H. L. and Son.—J. E. and Son.

M. (Everybody is down on the unfortunate poster. We do not feel inclined to follow suit.)—Not a Young Member. (You, and others who very properly think as you do, should look to it next time that no such occurrence is possible.)

"BUILDING NEWS" DESIGNING CLUB.

A. A small dairy farm, with house attached, accommodation to be provided for 25 cows. Plan, section, and bird's-eye view. Drawings to be made to a scale of 16ft. to the inch.

Drawings Received.—Belteshazzar, Tom Pinch, Shalloch, K. G. S. W., In Hoc Signo Vinces, En Avant, Quid, Lancaster, Jack, Per, Tempus Fugit, Ephraim, V in circle, Nemo, That's my Idea, Cui Bono, Jackdaw, Merit, Hamlet, Trial, Ambition, Rex, Eclipse, Beta, Quiet and Simple, Squib, Pupil J., S. A. H, Peace in circle, Good Luck to Your Fishing, Strad, Snowflake, Cambria, Iota, Bonus Hominus, Kairon, Con in circle.

Correspondence.

ARCHITECTURE AT THE ACADEMY.

To the Editor of the Building News.

Sir,—As one taking a great interest in the arts, and especially in architecture, perhaps you will allow space for my humble opinion, which is at least honestly given and felt. This year, more than ever in the past, after an inspection of the many truly beautiful works in the other galleries, I cannot express the disappointment I felt in room No. 9, allotted to architectural drawings. After Mr. Alfred A. Hudson's clever and pleasing interior of the Church of St. Peter, Southsea, there are not more than one dozen drawings that should have been hung. Some of the designs are tolerably good, and even neatly drawn; but is this sufficient for an exhibition like the Royal Academy? Here we have, like so many Dutch cheeses, a large number of tame, milk-and-watery pen-and-ink drawings which, even if produced by artists of a higher order, would be but miserably cold and unattractive after the glow of colour we have had in the other galleries. Surely colour is applicable to architecture; and let us hope there are those who can use it. If not, let architects keep their lifeless productions at home, and not make public how deficient they are in this branch of their art, and how far they are behind their brethren of the other craft. Very few people visited this room, and fewer still lingered long there.

Knowing how large is the demand for space by artists, it would not be surprising to find this gallery closed against architecture before long.—I am, &c., W. R.

R.I.B.A. EXAMINATION.

Sir,—I was glad to see, in your last issue, a letter from a correspondent calling attention to the entrance fees charged by the Institute from candidates for the architectural examination.

It seems to me that a wealthy society like the R.I.B.A., which includes, among its numbers, nearly all the influential architects in the kingdom, might examine candidates for an examination in their own profession, without charging them any entrance fee whatever. They surely could afford to spend £20 per annum upon this worthy object without feeling it very much.

As the council, doubtless, will not know what to do with the £43 they have in hand from the last examination, perhaps I might suggest that they offer it as a travelling studentship for this year only. To prevent its competing with the Pugin studentship the successful candidate might be required to spend six weeks upon the Continent instead of in the United Kingdom like the Pugin student.

If you think this suggestion worthy of consideration, I shall be glad if you will publish this letter in your next issue.—I am, &c.,

May 11. Student.

BELPER PUBLIC HALL COMPETITION.

Sir,—To what do the public imagine the architectural profession is coming?

After having been kept waiting a week by the courteous but doubtless busy secretary, I have just received particulars of the above competition.

I note that the accommodation to be provided is a large hall, capable of seating 600 persons, with two retiring-rooms; a small hall to hold 200 persons, with one retiring-room; at least four offices on the ground-floor (one of which must be large enough for a billiard-room, with the usual ante-room), closets, lavatories, &c. The building is to be heated by hot water, with all the newest and best mechanical appliances.

To provide this liberal accommodation, the munificent sum of £2,500 is placed at the disposal of the architect.

Now, Sir, we come to the reward of the fortunate (?) architect. A premium of £20 will be paid for the design which may be selected, on condition that the successful architect shall, within one calendar month, produce a *bonâ-fide* tender from a competent builder, to be approved by the directors, to carry out the works for a sum within 5 per cent. of the amount before-named (£2,500), according to a specification, to be approved by the directors, which, together with the design, is to become their property.

The particulars state, and I fear that in this there must be some hidden meaning, that the premium awarded is to "merge in the amount of commission to be *fixed by the architect* for which he would superintend the completion of the building."

Of course, I have the greatest respect for this particular board of directors; but it seems to me, in all the circumstances of the case, that the largest sum the fortunate architect may hope for, in return for his plans and complete specification, is £20.

If any one has a doubt as to the generosity of this high-minded body of directors, the facts that they charge the paltry sum of sevenpence for their badly-lithographed particulars, that the plans will not be received unless carriage be prepaid, and those not selected will be returned

at the expense of the competitors, may help him to a decision.—I am, &c.,

London, May 9. LIVE AND LET LIVE.

SLIDING HALL-DOORS.

SIR,—I beg to suggest, through your columns, that it would be a great improvement if builders, in constructing houses, would occasionally introduce sliding inner hall-doors. Numbers of your readers must have experienced annoyance, if not loss, from the banging of an inner hall-door, or the breaking of the glass therein, when the servant is endeavouring to open the front door, on a windy day, without previously closing the inner door. As in most cases where the inner hall-door is placed it would be perfectly convenient to make it a sliding door, its employment under these circumstances seems most desirable, and I would strongly recommend the adoption of the principle to those who are intimately connected in providing comfortable dwellings.—I am, &c.,

FREDK. PITMAN.

20, Paternoster-row, London, E.C., May 5.

THE FIRE IN THE HAYMARKET. CIVIL SERVICE CO-OPERATIVE SOCIETY'S STORES.

SIR,—Your paper of 6th inst., contains a letter from Mr. A. C. Hurley, expressing some doubt as to the capacity of the cast-iron stanchions in the lower basement of this building to sustain each safely the load of 300 tons, which they were designed to carry.

The stanchion which forms the subject of Mr. Hurley's calculation is 8ft. 9in. long, not 10ft., as he assumes. The width, as he correctly states, is 18in., the section cruciform, and the thickness of metal, 2in. The proportion, therefore, of length to breadth is something less than 6 to 1, and although I do not profess to be an engineer, I submit that Gordon's formula, which Mr. Hurley uses, and which assumes the ultimate strength of a column or strut to be its resistance to bending, is quite inapplicable to this case. The fact of the webs of the stanchion being thoroughly braced laterally, renders it, not as Mr. Hurley ironically suggests, "inordinately compressible" (*sic*), but brings into play the full power of resistance to compression of which the material is capable.

I assume, therefore, that the stanchion is equal to sustain with perfect safety a dead load of one-tenth its ultimate crushing strength. The sectional area is 69 superficial inches, and Molesworth gives the mean crushing strength of cast iron at 48 tons per inch. This gives a breaking load of 3,312 tons, and with 10 for a factor of safety, the safe load would be 331 tons. The utmost possible load the stanchion can ever be called upon to sustain is 300 tons, and that would only be under the very exceptional and improbable circumstance of all the eight floors of the superstructure being simultaneously occupied by the usual storage and dense crowds in the sale-rooms, and goods closely packed from floor to ceiling in the warehouse rooms.

I may state, however, that the stanchions, being entirely encased in Dennett's concrete, are not liable to some of the contingencies which render so high a factor of safety necessary as is generally allowed for cast-iron columns and stanchions, such as the danger of fracture by blows from rolling weights or other external injury.

The cruciform section of the stanchions allows a thorough examination of the quality and accuracy of the castings to be made, which would not be possible in the case of cylindrical columns. The top and bottom faces are lathe-turned, the surfaces of contact being circular. The whole of the ironwork was designed by Mr. R. M. Ordish, an engineer of great experience, and well-known reputation, and I am perfectly assured of the correctness of his calculations as well as of the quality of the work, which was carried out under careful supervision both from him and myself.

I inclose a series of calculations made by Mr. Max am Ende as to the strength of the stanchions in question, which may be of interest to your readers.—I am, &c.,

THOMAS VERITY.

27, Regent-street, S.W., May 11.

I have examined the drawings of the cast-iron stanchions in the lowest part of the basement in the premises belonging to the Civil Service Co-operative Society (Limited), Haymarket, and I have also inspected the stanchions themselves, and it appears that they are of cruciform section, 18in. × 2in., 8ft. 9in long, bedded in Dennett's concrete 21in. diameter. Disregarding the carrying strength of the concrete, but considering it capable of preventing the lateral yielding of the webs of the stanchions, I regard the latter as being in a better condition to resist axial pressure, than they would be without the concrete in a testing machine. I, therefore, consider it preferable to calculate the strength of the stanchions according to the theory of elasticity instead of using formulæ which are based on experiments with a testing machine.

This theory is used to decide the question whether a column or stanchion would break by bending or by crushing, and according to it, the resistance against bending is for columns with flat ends $P = \frac{4\pi^2 EJ}{l^2}$, in which formula l is the length, J the moment of inertia of the section, E the modulus of elasticity of the material, and $\pi^2 = 9{\cdot}868$.

The resistance against crushing (supposing the length sufficiently small) is $p = as$; a being the sectional area, and s the crushing strength. Comparing them with each other I get $\frac{p}{P} = \frac{asl^2}{4\pi^2 EJ}$, and putting $a = 69$ sq. in., $l = 105$in., J (about) $= 972$in.^{4}, $s = 48$ tons $= 107520$lb. (Molesworth), E $= 18{,}400{,}000$ (Mol.) I get $\frac{p}{P} = \frac{69 \times 107{,}520 \times 11{,}025}{4 \times 9{\cdot}868 \times 18{,}400{,}000 \times 972} = 0{\cdot}115$, or about one-ninth. This shows that the stanchion would not break by bending, and that its length might have been greatly increased before the liability to bend would occur. The strength of the stanchion is, therefore, $p = as$, which gives for $s = 48$ tons, $p = 3{,}312$ tons. Taking the load at 300 tons, this represents a factor of safety of eleven. I consider this an ample factor of safety.

I may add that, in order to combine the two formulæ into one, Rankine, Gordon, and others have put $1 + \frac{p}{P}$ in place of $\frac{p}{P}$, so that the strength of the column or stanchion would be represented by $\frac{p}{1 + \frac{p}{P}}$.

In order to make this formula agree with the theory, at least within a certain range of lengths of columns, and with the results of experiments, it was necessary for those authors to alter the constants s and E, but as the stanchion here referred to is not within that range of lengths, and as it is in a condition materially differing from that of stanchions in a testing machine, that formula does not apply here. MAX AM ENDE, C.E.

3, Westminster Chambers, Victoria-street, S.W.

May 9, 1881.

"FIRE IN THE HAYMARKET."

SIR,—Your interesting article on the great precautions taken to render the Civil Service Stores fireproof, serves also to draw marked attention to the one weak point in the system. It is of little avail to build a massive embankment to keep out the sea if an aperture is left in it; and so long as our "fireproof" floors have lift "shafts" running through them, the devouring element, while respecting the shell, will consume the contents as ravenously as ever.

I do not know if the Stores' liftways were encased or not, but it may be opportune to call attention to the practice of forming shafts, which is so common, so very dangerous, quite useless and, consequently, wasteful. Dangerous, because if a fire breaks out, the shaft acts as a large flue does on a furnace; useless and wasteful because all that is required is a close balustrade to keep people from falling down the hole, and high enough to prevent them leaning over and getting their heads cut off.

But the great desideratum for all buildings is the means of closing the liftway every night at each floor-level. Every aperture can be so closed, and I have carried out the plan. If the covers are only of wood, tongued with iron, they will prevent a draught, without which a fire burns very slowly; but it would be as easy to make them of fireproof material—say coke breeze and cement concrete. I will not trespass on your space by going into the mechanical details for opening and shutting these.

I venture, however, to say that if this system were adopted, our fire-insurance companies would be saved immense losses, which would have the effect of reducing premiums, and so be a great public gain, while the inconvenience and loss of business to the immediate victim of the fire would be reduced to a minimum.—I am, &c.,

57, Moorgate-street, E.C. EDWIN T. HALL.

THE DOMINICAN CHURCH AT HAVERSTOCK-HILL.

SIR,—I have for some time heard secret rumours of something about the Dominican Church at Haverstock-hill, but until the publication of Mr. Buckler's letter in your paper of the 7th inst., was ignorant of the cause. That church has been my admiration since its commencement, and I much sympathise with Mr. Buckler in his efforts to do justice to his noble conception, when hampered, if possible, by a more than usual want of funds. The hostile criticisms of Messrs. Walford and Scott must surely recoil on those gentlemen. Those who, like myself, have had the pleasure to meet Mr. Buckler abroad, and been with him while carefully drawing and measuring some of the best examples, must be amused at their impertinent remarks.—I am, &c., W. C. S.

London, S.W., May 10.

[We have also received another letter signed "A Sacristan" which we do not see our way to insert, as we think the name of the writer should be appended.—ED. B.N.]

MRS. GERARD LEIGH'S HOUSE.

SIR,—In your otherwise particularly accurate account of the decoration of Mrs. Gerard Leigh's house in Grosvenor-square there is one important mistake. The carton-pierre ornamentation was executed by Messrs. Jackson and Sons, of Rathbone-place, to the leading partner in which firm I am indebted for his great personal interest in the renovation of the enriched work.—I am, &c.,

FREDERICK ARTHUR.

18, Motcomb-street, Belgrave-square, S.W.

May 10.

Intercommunication.

QUESTIONS.

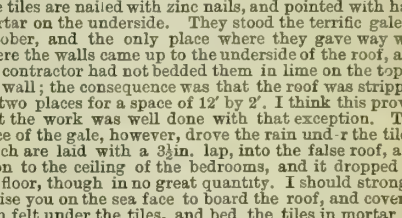
[6501.]—**New Burials Act.**—In erecting a chapel, in a new cemetery, to be used by all religious denominations (unconsecrated), is it usual or necessary to place an altar-table at the east end? If so, by what sect would it be used?—E. C.

[6502.]—**External Plaster Coves.**—Will someone kindly advise me as to the proper material to employ for external plaster coves and panels in half-timber work? I want something white, creamy, or pinky-coloured.—J. H. C.

[6503.]—**Condensation.**—I have recently erected some church-roofs in oak, having others in hand. I should be glad of advice on the following:—I find that the roofs suffer from "condensation." The material is perfectly dry, some of it being old stuff reused. Roofs are of low pitch, about 20°. Lead is laid on back of inch rebated boarding. Would another layer of deal boards avail (as I wish to use up old stuff)? Should be glad to hear of any means other than the use of felt between lead and boards to obviate this.—TELUM.

REPLIES.

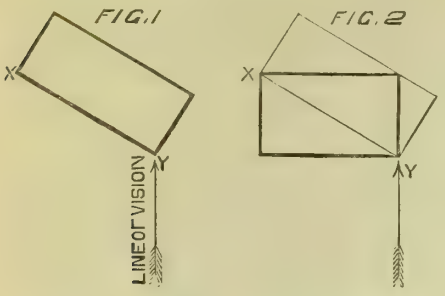
[6472.]—**Plain Tile Roofing.**—I noticed your question in the BUILDING NEWS, and Mr. Lascelles' answer. This house, the design of which was given in the B. N. in June, '78, was designed by Mr. J. D. Sedding. It is roofed with Welsh tiles, similar in every respect to Staffordshire. The tiles are nailed with zinc nails, and pointed with hair mortar on the underside. They stood the terrific gale in October, and the only place where they gave way was where the walls came up to the underside of the roof, and the contractor had not bedded them in lime on the top of the wall; the consequence was that the roof was stripped in two places for a space of 12' by 2'. I think this proves that the work was well done with that exception. The force of the gale, however, drove the rain under the tiles, which are laid with a 3½in. lap, into the false roof, and so on to the ceiling of the bedrooms, and it dropped on the floor, though in no great quantity. I should strongly advise you on the sea face to board the roof, and cover it with felt under the tiles, and bed the tiles in mortar as well as nail them. You need be in no fear about ventilation under tiles; I find there is too much. It's all very well talking of what will do at Lowther Lodge; but place a house as this is on the edge of a cliff 230ft. high, and it is quite another thing. I took the precaution to board the roof where the ceilings came up to the spars, and we therefore would not be able to get at it, but wherever there is an open space the roof is not boarded. This is the pitch of my roof as taken from the tracing of plans. I



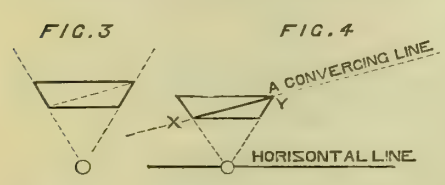
am not an architect, but I shall be glad to answer any question you may wish to ask, or, if you happen to be in this neighbourhood, show you my house. Don't use the ordinary felt: it is generally rubbish. Get a sample from Denny Bros., Leeds.—G. ALDERSON-SMITH, Wheatcroft Cliff, Scarborough.

[6475.]—**Advantages of Centrolineads.**—A youthful draughtsman says to me, the practical method of using a centrolinead, given in reply 6475. April 29th, is intelligible, but it involves the necessity of having one true converging line to set it to. Surely, he says, this leaves me where I was before, with the long unhandy straight-edge, and the want of elbow-room to project the true position of the vanishing-point, and so lay down that one converging line. Here is his short cut. His plan stands thus at an angle to his line of vision (Fig. 1). All he wants is to lay down on his drawing any one line parallel to $x-y$ tending to its proper vanishing point. Let him ignore the ordinary process of finding a vanishing-point, which may be inconveniently out of

reach. Let him lay down on his plan (Fig. 2) a rectangle which is parallel to his line of vision, and of which the line $x-y$ will be now the diagonal. It is manifestly very



easy to put this rectangle in perspective with its one vanishing-point without requiring more room than within the compass of an ordinary drawing-board. Here it is, we will say (Fig. 3). Manifestly, if we draw the diagonal $x-y$ on this, we have the converging line we want tending in the proper direction, and can start fair (Fig. 4),



with our centrolinead "dodging" the arms and screws by guess-work, as described in previous reply, until the side of the straight-edge accommodat s itself to both horizontal and converging line.—T. DREW, Dublin.

[6479.]—**Board Schools.**—I called at the Education Department the other day to obtain particulars for planning and fitting schools. Though they were printed in October, 1880, they do not, in glancing over them, appear any different from those issued twelve years ago. The rules are to be obtained from the Department at Whitehall, and, I should also think, from the printers, Messrs. Eyre and Spottiswoode.—HUGH MCLACHLAN.

[6493.]—**Hoop-Iron Bond.**—If properly tarred, a wall would never be lifted by oxidation of hoop-iron bond. Probably the builder in question saw some of his own work served in manner described, and he, through ignorance, puts it down as a general rule.—W. M.

[6495.]—**Vegetation on Stone.**—To stop the vegetation spoken of, either remove the tree or tombstone.—W. M.

[6496.]—**Illustrations for Lectures.**—If "Scotch Clergyman" will give his address, or send it to the Editor, who has mine, I can help him to what he wants.—A.R.I.B.A.

Our Office Table.

THE First Commissioner of Works alluded on Saturday to the pulling down of the present Law Courts, which obscure the view of Westminster Hall from what is called Parliament-square. That work will probably be undertaken next year. But there is, we hear, a much larger work in contemplation. The present Admiralty is very inconvenient, the building is wasteful in its arrangement, and there are several important departments of the Admiralty which are lodged in houses in Spring Gardens and in Spring Gardens-terrace. Then, again, the War Office is in a worse position. It is composed of the War Office proper, of the annexe of Buckingham House, and it has a department in St. James's-square, on the opposite side of Pall Mall. It is in contemplation to build upon the site of the Admiralty and upon that of Spring-gardens and Spring Gardens-trrrace new offices for the Army and Navy departments.

ABOUT thirty of the employés of Messrs John H. Julian and Sons, contractors, Truro, were entertained to a supper on Friday evening last, at Polwithen, Penzance, the residence of Mr. William Bolitho. Mr. James Julian, on behalf of the firm, and Mr. Welch, their general foreman, were present, and a very pleasant evening was spent, Mr. Bolitho also honouring the company with his presence. The health of Mr. and Mrs. Bolitho and family were heartily drunk, as also that of the contractors, and other toasts which followed. A large billiard-room and additional kitchen apartments have been recently built and completed, which are attached to the very fine mansion-house of Polwithen, from the plans of Mr. David Brandon, architect, of London. Mr. Bolitho, in proposing the health of the firm, congratulated them on the very good job they had done, also on the very good conduct of the men during the progress of the work.

THE *Harrow Gazette* says: —"However much the exterior of the Harrow School Speech-room, which was designed by Mr. W. Burges, A.R.A., has been criticised, every lover of art who knew anything of his abilities must greatly deplore that he has not lived to carry out the decoration of the interior. In the work suitable for such a building he was an unrivalled artist, and had he completed it much additional interest and value would have accrued. It is due to him to state that he was somewhat restricted as to plan, if not design, and that his original design, which to us appeared a handsomer one for the exterior, was not adopted; and great allowance should be made for the exceptionally awkward and difficult site on which he had to erect the building. When the present structure is partially covered with ivy, and the south tower completed from his design, the exterior of the building may gain in public favour. We trust that a little energy exerted at the coming Speech-day may secure sufficient subscriptions to carry out this part of the unfinished work. The opportunity for decorating the interior as he would have so ably and artistically done it, is, we fear, lost."

PEOPLE who acquired property within a radius of 20 miles of St. Paul's years ago, were wise in their day and generation. Their posterity, at all events, will bear witness to their sagacity. Mr. J. Taylor doubtless knew what he was about when he invested money in some not very attractive fields in the neighbourhood of London. At that time the Metropolis was a long way from those fields. Now the suburbs are built upon them, and the cry is "still they come." The result is that by his will two ladies take this property of Mr. Taylor, and the estimated value thereof amounts to the nice sum of four millions sterling. Two ladies worth between them four millions sterling are worthy of consideration. Even in these days Mr. Taylor's will can have but one result—that of stimulating speculation in land within measurable distance of the dome of St. Paul's.

A SELECT Committee of the House of Commons has been sitting during the last few days on the Bill promot d by the North British Railway Company for the construction of a new railway bridge over the Tay, and on Wednesday the preamble of the Bill was declared to be proved. The proposed structure, which is for a double line of rails, is designed by Mr. Barlow, C.E., and is estimated to cost about £679,000, as against £353,000 which was spent on the single-line bridge destroyed in December, 1879. It will be raised on entirely new foundations, and the Committee have stipulated that every caisson in the piers shall be properly adjusted to bear at least 33 per cent. above the maximum weight to which it can be subjected. The height has been reduced eleven feet below that of the old structure, thus giving a waterway for ships passing to Perth and Newburgh of 77ft. instead of 88ft.

A LECTURE was delivered on Friday last at the Royal United Service Institution by Captain Bucknill, R.E., on the application of lightning conductors to buildings and magazines. The lecturer, who has been employed in testing and inspecting a number of Government conductors, especially drew attention to the following among other points:—1. The necessity of using continuous conductors with the smallest possible number of joints, and these joints carefully soldered. 2. The advantage of multiple points. 3. The necessity of using larger earth connections than is now usual, and of making some of them deep and and some shallow. 4. The advantages of iron over copper conductors. 5. The unreliability of the so-called safe circle advocated by some electricians. 6. The advisability of providing a horizontal collecting conductor near the ground to connect the various earths with all the conductors, rain-water pipes, &c. 7. The want of periodical inspection and of testing the conductors electrically when they are properly put up. The lecturer exhibited an apparatus for testing conductors, as well as samples of both copper and wire ropes. For general purposes he recommended an iron-wire rope 6lb. to the yard, and 3lb. per yard when it was carried over the house to two "earths" on opposite sides. The equivalent ropes in copper would weigh 1lb. and ½lb. respectively, and cost about the same as the iron.

LATE advices from the Isthmus of Panama state that the engineers of the proposed ship canal have sunk a shaft 100ft. deep, where the Chagres river dam is to begin, and have not yet found bed rock. This is not an encouraging sign, as the possible success of the canal hinges on the feasibility of diverting the course of the river by the proposed dam. The dam will have to be over a mile long and 150ft. high. It is proposed to make it 3,150ft. wide at bottom and 780ft. at top, the lake created by it to contain a thousand million tons of water. This is a stupendous project at best; and if the foundations of the dam must be laid more than 100ft. below the surface, the successful issue of the undertaking to which it is preliminary becomes more than ever problematical.

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FREDERICK ARTHUR,

DECORATOR TO HER MAJESTY.

MEETINGS FOR THE ENSUING WEEK.

SATURDAY (TO-MORROW)—St. Paul's Ecclesiological Society. Visit to St. Helen's Church, Bishopsgate. 3 p.m.

MONDAY.—Society of Arts. "Colour Blindness, and its Influence on Various Industries." By R. Brudenell Carter, F.R.C.S. Cantor Lecture No. 1. 8 p.m.

TUESDAY.—Institution of Civil Engineers. Discussion on "Torpedo Boats and Light Yachts for High Speed Steam Navigation." 8 p.m.

WEDNESDAY.—Society of Arts. "The Electrical Railway and the Transmission of Power by Electricity." By Alexander Siemens. 8 p.m.

British Archæological Association. "Oak Figures Discovered in Britain, Brittany, &c." By. Dr. J. S. Phené, F.S.A. 8 p.m.

THURSDAY.—National Health Society. Lecture No. 1, on "The Science and Art of Sanitary Plumbing." By S. Stevens Hellyer, Society of Arts room. 7.30 p.m.

Society for the Fine Arts. "The Art Decoration of Auditoria." By Frank Roland, M.A. 8 p.m.

FRIDAY.—University College. Prof. Newton, C.B., on "The Monuments and Games of Ancient Greeks and Romans." Lecture No. 3. 4 p.m.

Royal Institution. "Shakespeare Criticism." By W. H. Pollock. 9 p.m.

Lamplough's Pyretic Saline is refreshing, most agreeable, and the preventive of FEVERS, BILIOUSNESS, SMALL POX, SKIN DISEASES, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill. *Use no substitute.*—[ADVT.]

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PICTOR & SONS, BOX, WILTS.
(See trade advt. on p. XXVII.) [ADVT.

TENDERS.

. Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender—it adds to the value of the information.

BEDFORD.—For new premises, for the London and County Banking Company (Limited). Messrs. Usher and Anthony, Bedford, architects:—

Higgs and Hill, London	£3,980 0 0
Rider and Son, London	3,648 0 0
Freshwater, Bedford	3,580 0 0
Foster, Bedford	3,111 0 0
Spencer, Bedford (accepted)	3,080 0 0

BERMONDSEY. — For the enlargement of the Laxon-street School by 700 places, for the London School Board:—

Staines and Son	£8,484 0 0
Hobson, J. D.	7,974 0 0
Lathey Bros.	7,927 0 0
Kirk and Randall	7,715 0 0
Jerrard, S. J.	7,583 0 0
Higgs and Hill	7,426 0 0
Nightingale, B. E.	7,472 0 0
Tongue, W.	7,386 0 0
Grover, J.	7,364 0 0
Shepherd, W., Bermondsey New-road (accepted)	7,083 0 0

[(*a*) Cost of school buildings only, including cloak-room and staircases, £5,760; (*b*) cost of tar pavement and playground, £82; (*c*) cost of boundary-walls and gates, £171; (*d*) cost of teachers' room, £300; for special expenditure on site, (*e*) cost of new w.c. buildings, £345; (*f*) cost of extra deep excavations, £247; (*g*) cost of works to existing buildings, £154; (*h*) cost of making good to old houses adjacent, £24; total, £7,083. Cost per head of (*a*), £8 4s. 6d.; total cost per head, £10 2s. 4d.]

BOURNEMOUTH. — For alterations and additions at Stourville, to be afterwards called Streate-place, in Gervis-road, on the East Cliff, Bournemouth, Hampshire, for Mr. Horace Dobell, M.D. Mr. A. Bedborough, architect. Quantities supplied by Messrs. R. L. Curtis and Sons:—

	House.	Entrance Gateway.
Pike	£1,873 0 0	£72 0 0
George	1,870 0 0	56 0 0
Minty	1,690 0 0	50 0 0
Abley	1,640 0 0	63 0 0
Hoare Bros. and Walden	1,546 0 0	65 0 0
Stroud	1,533 10 0	70 10 0
Howell and Son	1,520 0 0	75 0 0
Blackford	1,489 6 0	53 4 0

BRADFORD. — Formation of roadway, 79 yards long, back of Sturges-street, including flagging, setting and drainage; also, the building of six blocks of sanitary closets, &c. Mr. T. L. Patchett, Halifax, architect:—
Parkins and Forbes, Bradford (accepted).

BRIGHTON.—For new shop-front, &c., at 15, Ship-street, Brighton. Mr. A. Loader, architect:—

Hackman, W., Brighton	£256 0 0
Webber, W. H., Brighton	245 10 0
Newnham, J. M., Brighton	243 0 0
Lockyer, G. R., Brighton (accepted)	223 0 0

BROMLEY-BY-BOW, E.—For the erection of a school to provide accommodation for 1,400 children on the site in Oban-street, Bromley, for the London School Board:—

Hook and Oldrey	£22,368 0 0
Williams, G. S. S, and Son	20,452 0 0
Chappell, J. T.	20,156 0 0
Grover, J.	19,863 0 0
Higgs and Hill	19,749 0 0
Cox, C.	19,664 0 0
Harris and Wardrop	18,980 0 0
Lawrence, E.	18,844 0 0
Staines and Son	18,775 0 0
Atherton and Latta	18,500 0 0
Kirk and Randall	18,454 0 0
Jerrard, S. J., of Lewisham*	18,244 0 0

* Accepted.

[Cost of site (area 47,100 square feet), £4,497 13s. 4d.; (*a*) cost of school buildings only, including closets, £11,862; (*b*) cost of tar pavement and playground, £778; (*c*) cost of boundary walls and gates, £787; (*d*) cost of covered playgrounds under main building, £2,807; (*e*) cost of teachers' rooms, £400; (*f*) cost of schoolkeeper's residence, £350. Special expenditure on site; extra foundations and removing bank, £1,260; total, £18,244. Cost per head of (*a*) £8 9s. 5d.; total cost per head, £13 0s. 7d.]

CAMBRIDGE.—For rebuilding farmhouse and buildings, Guyhime Mr. Hatchard Smith, A.R.I.B.A., 41, Moor-gate-station-buildings, E.C., architect:—

Cousens (accepted)	£152 0 0

GREAT YARMOUTH.—For the erection of house, Gorleston. Mr. W. B. Cockrill, architect:—

Leggett	£775 0 0
Fuller	727 0 0
Norfor	725 0 0
Kemp	716 0 0
Want	697 0 0
Bray (accepted)	674 0 0
Hewett	657 10 0

GREAT YARMOUTH.—For the restoration of warehouse, recently destroyed by fire, Gorleston. Mr. W. B. Cockrill, architect:—
Bricklayer, £270.
Carpenter and joiner, £2,480
Painter, plumber, and glazier, £42.
Slater, £60.
Gas fitter, £20.

GREAT YARMOUTH.—For additions to house, Southtown. Mr. W. B. Cockrill, architect:—

Leggett, J.	£155 0 0

GREAT YARMOUTH.—For additions to Grove House. Mr. W. B. Cockrill, architect:—

Nickerson, G.	£110 0 0

HAMPSTEAD.—For additions, Charlecote, Hampstead Hill Gardens, Hampstead, for Mr. C. Green. Messrs. Batterbury and Huxley, architects:—
Holliday, J., Jun., Brixton (accepted).
[Five tenders received.]

HAMPSTEAD.—For house, Hampstead Hill Gardens, Hampstead, for Mr. C. Gurden. Messrs. Batterbury and Huxley, architects:—
Nightingale, B. E, Lambeth (accepted).
[Six tenders received.]

HIGHGATE, N.—For the erection of a school to provide accommodation for 600 children on the site in Rochester-place, Highgate Hill, for the London School Board:—

Wall, Brothers, Kentish Town*	£7,725 0 0

* Accepted.

[Cost of site (area 17,762 square feet), £2,590 6s. 7d.; (*a*) cost of school buildings only, including closets, £5,293; (*b*) cost of tar pavement and playground, £260; (*c*) cost of boundary walls and gates, £499; (*d*) cost of teachers' rooms, £300; (*e*) cost of schoolkeeper's house, £350. Special expenditure on site:—Levelling ground, building retaining walls under boundary walls, &c., £1,023; total, £7,725. Cost per head of (*a*), £8 16s. 5d; total cost per head, £12 17s. 6d.]

HUDDERSFIELD.—Erection of a new chancel and re-seating of nave, and sundry alterations at Christ Church, New Mill, near Huddersfield. Mr. F. Moorhouse, 5, New-street, Huddersfield, architect. Quantities by Mr. W. Hoffman Wood, 4, Albion-place, Leeds:—
Mason:—Turner, W., Holmfirth, near Huddersfield.
Joiner:—Swallow, J., New Mill, near Huddersfield.
Plumber:—Lidster and Armitage, Brook-street, Huddersfield.
Slater:—Chappell, E., Leeds-road, Huddersfield.
Plasterer:—Jackman, G., Holmfirth, near Huddersfield.
Painter:—Lawton and Hogley, Holmfirth, near Huddersfield.
Ironmonger and hot-water engineer:—Thornton, W. and S., Kirkgate, Huddersfield.
Tiler:—Minton, Hollins and Co., Stoke-on-Trent, Staffordshire.
Organ builder:—Forster and Andrew, Charlotte-street, Hull.
Total amount of estimates, £2,200.

HULL FERRY BOAT DOCK.—Reconstruction of Victoria Pier with raised promenade, &c., for the Hull Corporation. Mr. J. Fox Sharp, C.E., borough engineer:—

Nelson, T. and Co., York	£23,890 0 0
Musgrave, B., jun., Hull	19,367 2 1
Lane, J., South Shields	18,581 11 9
Godfrey, G. B., Hull	17,321 17 5
Simpson and Malone, Hull	16,207 7 8½
Storry and Jagger, Hull (accepted)	14,782 7 7
Pearson, J., Hull	14,409 18 5
Estimate of Borough Engineer	15,431 18 0

ISLINGTON. — For the enlargement of the Blundell-street School by 600 places, for the London School Board:—

Staines and Son	£9,484 0 0
Williams, G. S. S. and Son	8,880 0 0
Scrivener, W. and Co.	8,816 0 0
Pritchard, G. S.	8,772 0 0
Roberts, L. H. and R.	8,690 0 0
Lawrance, E.	8,682 0 0
Higgs and Hill	8,664 0 0
Sargeant, J. F.	8,551 0 0
Grover, J.	8,364 0 0
Manley, M.	8,339 0 0
Wall Bros., Kentish Town*	8,176 0 0

*Accepted.

[The cost of this enlargement is beyond the limit of the Education Department, as the school was not originally planned for extension, and it will, therefore, be necessary to provide new staircases and corridors. (*a*) Cost of enlargement, including closets, £6,109 3s. 11d.; (*b*) tar pavement and playground, £177 4s. 8d.; (*c*) boundary walls and gates, £163 :s. 9d.; (*d*) covered playgrounds, £627 5s. 6d.; (*e*) teacher' rooms, £300; (*f*) school-keepers' house, £100; special expenditure as to site—(*g*) works to present school, £349 11s.; (*h*) new cloakrooms for school, £358 12s. 2d.; total, £8,176. Cost per head of (*a*), £10 3s. 7d.; total cost per head, £13 12s. 6d.]

KINGSLAND.—For alterations, &c., to Fox public-house, Kingsland-road:—

Foxley	£5,454 0 0
Cocks	5,298 0 0
Patrick	5,050 0 0
Anley	4,978 0 0
Conder	4,896 0 0
Shurmur	4,797 0 0
Ashby Bros.	4,771 0 0
Williams	4,589 0 0
Toms	4,443 0 0

LIMPENHOE, NORFOLK.—For building new chancel and vestry, reseating nave and restoring tower of the church of St. Botolph. Mr. A. S. Hewitt, 8, Regent-street, Great Yarmouth, architect:—

Spaull, Norwich	£2,119 0 0
Hubbard, East Dereham	1,996 0 0
Cornish and Gaymer, North Walsham	1,892 0 0
Durrant, South Walsham	1,762 0 0
Hawes, Norwich (accepted)	1,575 0 0

MARYLEBONE. — For the enlargement of the Barrow Hill-road School, Portland New Town, by 200 places, for the London School Board:—

Lawrance, E.	£1,824 0 0
Manley, M.	1,794 0 0
Pritchard, G. S.	1,754 0 0
Roberts, L. H. and R.	1,752 0 0
Scrivener, W. and Co.	1,749 0 0
Higgs and Hill	1,698 0 0
Grover, J.	1,694 0 0
Williams, G. S. S. and Son	1,650 0 0
Wall Bros.	1,605 0 0
Sargeant, J. F., Hackney (accepted)	1,593 0 0

[(*a*) Cost of enlargement, including closets, £1,493; (*b*) cost of teachers' rooms, £100: total, £1,593. Cost per head of (*a*) only £7 9s. 3d; total cost per head, £7 19s. 3d.]

MILE END.—For water-tower, boiler-house, chimney shaft, &c., for the guardians of the Hamlet, Mile End Old Town. Mr. W. Knight, architect:—

Shurmur	£3,645 0 0
Croaker	3,395 0 0
Hearle and Son	3,393 0 0
Wood, W.	3,320 0 0
Perry and Co.	3,246 0 0
Gentry	3,190 0 0

MITRE TAVERN. — For building the Mitre, for Mr. Barnes. Mr. Brooker, architect:—

Cole	£1,894 0 0
Drake	1,890 0 0
Shurmur	1,485 0 0
Jackson and Todd	1,445 0 0
Cullum	1,433 0 0
Hubble and Scott	1,350 0 0

NEWPORT, MON.—For the erection of new Free Library, in Dock-street, for the town council. Messrs. A. O. Watkins and Son, architects:—

Jones, W. and Son	£4,043 0 0
Richards, W.	4,033 0 0
Blackburn, W.	3,991 0 0
Martin, G.	3,980 0 0
Linton, J.	3,955 0 0
Church, W., Bristol	3,903 0 0
Thomas, G., Devon-place	3,422 0 0
Williams, J.	3,400 0 0
Miles, C., Newport (accepted)	3,335 0 0

NEWPORT PAGNEL.—For new corn mill at Newport Pagnell, Bucks, for Mr. C. H. Whitworth. Messrs. Usher and Anthony, Bedford, architects:—

Cooper, Aylesbury	£2,282 6 0
Lilley, Bedford	2,130 0 0
Edey and Son, St. Neots	2,027 0 0
George, Stony Stratford	1,983 0 0
Harrison, Wellingborough	1,910 0 0
Cosford, Northampton	1,851 0 0
Foster, Bedford (accepted)	1,811 0 0
Ireson, Northampton	1,700 0 0

(Gravel and sand and all carting done by proprietor.)

NOTTINGHAM.—For alterations, Journal office, Victoria-street. Mr. R. C. Clarke, architect:—

Vickers, H. (accepted)	£285 0 0

NOTTINGHAM.—For new class-room, infants' department, St. Ann's Schools. Mr. R. C. Clarke, architect:—

Vickers, H. (accepted)	£284 12 0

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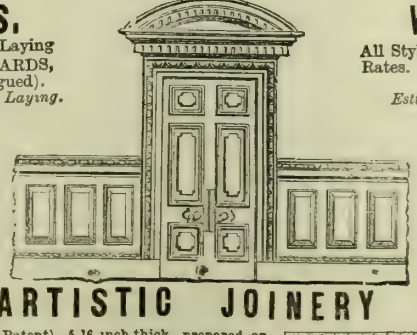

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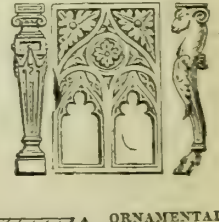

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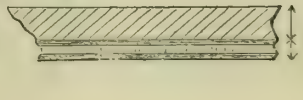

ORNAMENTAL PARQUET.
DEAL BACKING

Peacock Tavern.—For alterations, &c., to Peacock public-house, for Mr. E. J. Rose. Messrs. Wilson, Son, and Aldwinckle, architects:—

Hall, Beddall and Co.	£2,542 0 0
Merritt and Ashby	2,520 0 0
Bangs	2,389 0 0
Hearle	2,292 0 0
Cox	2,160 0 0
Beale	2,137 0 0
Shurmur	2,070 0 0

Reigate.—For erecting and completing a billiard-room and conservatory and other works at Lexden House, Reigate, for Mr. H. Carter. Mr. A. Bedborough, architect. Quantities supplied by Messrs. R. L. Curtis and Sons:—

Holdsworth	£1,163 0 0
Garrett...	999 0 0
Peat	991 15 0

Southbourne-on-Sea, near Bournemouth.—For the erection (in part) of the church of St. Catherine. Mr. Alfred Birt, architect. Quantities by Mr. W. H. Barber:—

Edwards, Southbourne-on-Sea ...	£2,087 15 0
George, Bournemouth	2,073 0 0
Stanley, Bournemouth	2,017 1 0
Hoare, Bros. and Walden, Victoria Works, Bournemouth*	1,966 0 0

*Accepted.

Stoke Newington, E.—For the addition of 400 places to the new school in Oldfield-road, for the London School Board:—

Wall, C., Lot's-road, Chelsea* ...	£3,347 0 0

*Accepted.

[(*a*) Cost of school buildings only, including closets, £2,459; (*b*) cost of tar pavement and playground, £208; (*c*) cost of boundary-walls and gates, £140; special expenditure, properly chargeable to site, (*d*) cost of extra depth of excavations, £102; (*e*) cost of levelling site, £138; (*f*) cost of revolving shutter partitions in old school, £300; total, £3,347. Cost per head of (*a*), £6 2s. 11d.; total cost per head, £8 7s. 4d.]

Stoughton.—For new dwelling-house and shop, Stoughton, near Guildford. Messrs. Peak, Lunn, and Peak, Guildford, architects:—

		Deduct if oven is not built.
Mitchell Bros., Shalford ...	£941 0 0	£41 0 0
Martin, Wells & Co., Aldershot.	850 0 0	20 0 0
Pierce and Clark, Guildford ...	777 7 0	Not named
Garnett and Mills, Guildford ...	775 0 0	—
Pink, R., Milford...	798 0 0	40 0 0
Harris, J., Woking	698 10 0	Not named
Strudwick, G., Guildford* ...	698 10 0	26 0 0

*Accepted.

Surbiton.—For Wesleyan chapel, Surbiton, Surrey, with spire. Mr. Charles Bell, F.R.I.B.A., Dashwood House, 9, New Broad-street, architect. Quantities by Mr. Henry Lovegrove, 26, Budge-row, E.C.:—

	Chapel.	Spire.	Total.
Woodward ...	£5,050 0 0	£700 0 0	£5,750 0 0
Green	4,929 0 0	682 0 0	5,611 0 0
White	4,645 0 0	745 0 0	5,390 0 0
Gregar	4,625 0 0	520 0 0	5,145 0 0
Hickinbotham .	4,395 0 0	685 0 0	5,080 0 0
Scase	4,388 0 0	678 0 0	5,066 0 0
Tyerman ...	4,397 0 0	630 0 0	5,027 0 0
Belham and Co	4,341 0 0	650 0 0	4,991 0 0
Allen and Sons	4,210 0 0	760 0 0	4,970 0 0
Higgs, F. ...	4,358 0 0	612 0 0	4,970 0 0
Lucas and Son	4,319 0 0	587 0 0	4,906 0 0

West Ham.—For the erection of a block of school buildings and appurtenances, at Regent's-lane, Custom House, in the parish of West Ham, Essex, for the West Ham School Board. Mr. J. T. Newman, architect. Quantities supplied by Messrs. R. L. Curtis and Sons:—

Boyce, T.	£6,490 0 0
Nightingale, B. E.	6,433 0 0
Abraham, R.	6,195 0 0
Wood Bros.	6,183 0 0
Wall Bros.	6,120 0 0
Hearle and Son	5,993 0 0
North Bros.	5,985 0 0
Reed, A.	5,959 0 0
Morter, J. (accepted)	5,893 0 0

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Dry Yellow Deals, £16 10s. per 120.
Spruce Deals, £15 per 120, 12ft. 3in. by 9.
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THE BUILDING NEWS.

LONDON, FRIDAY, MAY 20, 1881

HOUSE WARRANTY.

WHEN a house is let by a landlord to a tenant, there is no implied warranty that it is fit for habitation. Such is still, and apparently such always has been, the common law of England. Under the civil polity of ancient Rome, and in the codes of Continental Europe, a landlord or lessor is held to have impliedly warranted a house he lets as being fit for its purpose as a dwelling, and is even bound to disclose any latent defects. But amongst us the old rule of *Caveat emptor*, applies most rigidly to contracts between landlord and tenant, so that a man must pay rent for a house he may have taken, even though it is too unhealthy for him to live in not only in comfort but in safety. It is not impossible that in the progress of sanitary science, and the modern large and liberal views of law reform, this stern principle may come to be relaxed. But so it stands at present, and the only way in which a tenant can escape from its consequences, is to show that when, or before, he took the unhealthy house, the landlord or lessor had expressly warranted it as being fit for its purpose of a dwelling. People are at last awaking to this fact, and influenced by the popular preachings and teachings of sanitary reformers, they are gradually growing curious as to drainage. In the good old days, drains were left to look after themselves. But at this present period, intending tenants like to know both where they are, and what they are, before they finally take a house. That the public are fully aware of the importance of this question, as a matter of health, is abundantly proved by the many cases which have recently come before the courts of law. These cases serve to show what are the points that should be carefully considered by both landlord and tenant, and more especially by builders who let, and who warrant, the sanitary condition of their own houses. It is clear, first of all, that there must be an express warranty, a specific representation, for without this the tenant acts at his own risk. It must then be proved that this representation induced to the letting, and further that it was false. But if these things be well established, then, not only can a tenant have his contract rescinded, and successfully refuse to pay any rent; but he can also recover substantial damages for the breach of warranty, or, in other words, for the misrepresentation.

There were two cases last week before the High Court of Justice, one in each division, which are very interesting and instructive as good examples of this class of action. In both, the landlords were also the builders of the houses, and this considerably adds to their general importance; while, as they ended differently, this again is full of suggestion, and will cause us to inquire how they came to such opposite conclusions. In Taylor v. Upton, the action was brought for the first quarter's rent of a house at Harlesden, let at £90 a year. The tenant's defence was that he had been assured by the landlord that the house was dry, well drained, and well built: whereas he found it so damp that he could not live in it, and with a cesspool under the drawing-room window, instead of at the end of the garden, as he had been informed. It must be premised that, as a result of the law, the onus is thrown upon a tenant of making out his case as to the representations and their falsity. Now, here, it appeared that the defendant knew that there was a clay soil and a cesspool, and that the house was built without a basement. With this knowledge he nevertheless took the house, and the question then arose: Ought he not to have known that it would be damp, and that, having no sewers, its drainage must be, to some extent, dubious? If the tenant agreed to rent the house upon his own view of the premises, and was not induced to do so by the landlord's representations, supposing even that they were made and were false as he alleged, then he could not get off his bargain. After a trial extending over three days, the jury came to this conclusion, and they accordingly found their verdict in the landlord's favour. Upon an application being made for a new trial, this finding was supported by the Court. Lord Coleridge based his concurrence with the jury upon the ground that the tenant had not taken the house upon the representations complained of, but upon his own view. The Chief Justice pointed out that the builder naturally praised his own house, and as much as said that if a man chose to select a dwelling which he knew was built upon a clay soil, and drained only by a cesspool, he must expect it to be damp and to smell somewhat strongly. But it may be admitted that this sternly common-law view of the question is hardly in accordance with the more modern spirit of looking at such matters. Lord Coleridge thought little of the fact that the cesspool were actually under the drawing-room window; instead of at the end of the garden as stated, and that it had to be emptied by order of the inspector; nor, apparently, did the jury that tried the case; but it would seem that had the action been brought in the Chancery Division it might have ended differently, if we may judge from what happened in the second case we have now to consider.

In Kinnaird v. Smith, which was heard by Mr. Justice Kay, the tenant claimed to have his contract for the lease of a house at Tufnell Park-road rescinded, on the ground that misrepresentations had been made by the defendant, who was both the builder and owner of the house, as to the state of the drainage; and he further claimed the substantial sum of £275 by way of damages for expenses incurred by him in furnishing, removing, and repairing, and for doctor's charges brought about by illness in his family caused by the unhealthy condition of the house. In the course of some correspondence the landlord stated that the drainage was in good order, and that the drains were carried outside the house. According to the plaintiff, he acted upon these representations, and, believing them, he took the house for three years. But it also turned out that he sent a surveyor to inspect the premises before completing the contract; and, as the defendant alleged, really acted upon his own judgment in taking the house. Of course there was the usual conflict of evidence as to the actual condition of the drains themselves. But it was, at all events, clear that both the plaintiff's wife and the plaintiff himself had suffered from illness which their doctor said was caused by blood-poisoning from sewer-gas. This case also lasted several days, and in the end Mr. Justice Kay, who tried it, as is customary in the Chancery Division, without a jury, came to a conclusion wholly in favour of the plaintiff. He found that the representations had been made to and acted upon by the plaintiff, and that they were false. Upon the point whether or not the defendant knew them to be false, the judge made some very weighty remarks which are well worth remembering. "As the defendant was a builder," he observed, "and had superintended the building of this house, he could not be heard to say that he did not know the state of the drainage, for if he did not know it, he ought to have done so." In reading this we are struck with the difference in tone between it and the judgment of Lord Coleridge, and it is not easy to believe that these judges are supposed to be laying down the same law and in the same High Court of Justice. After referring to the strong conflict of evidence as to the state of the drains, Mr. Justice Kay comes to the statement of the doctor, whom he looked upon as an accurate and independent witness, and as turning the balance of testimony in the plaintiff's favour. In the end, therefore, the contract was ordered to be set aside, while the defendant was to pay such damages as the Chief Clerk should determine or the parties agreed upon.

Although these cases came to opposite conclusions, it is obvious that both are full of warning to landlords and tenants, and especially to such landlords as may also happen to be the builders of the property. There is no doubt but that the equitable view taken by Mr. Justice Kay must, before long, prevail over the older and stricter theory of the common law as laid down by Lord Coleridge following a long line of authorities. It is not likely that we shall, at all events yet awhile, get so far as to require landlords and lessors to disclose any latent defects that they may know of as existing in the houses they wish to let. But though the old principle, that there is no implied warranty as to the fitness of a dwelling for its proper purpose of habitation may continue untouched, it is probable that any representation amounting to an express warranty will, in the future, come to be construed more liberally than it has been hitherto in the tenant's favour. This change is, in part, due to the growing influence of equitable doctrines in our Courts since the Judicature Act began working, and, in part, also to the important place which sanitary science has now come to hold in public estimation. The cry for healthy houses has already spread far and wide, and it would be well if all builders were at once to recognise its growing influence. The lessons to be learnt from these two cases are that representations should not be lightly made by landlords as to the drainage of their houses, and that a sound system of drainage is daily becoming more and more essential to all paying property.

PICTURES AT THE ROYAL ACADEMY—III.

MR. LONG'S contributions fully sustain his great reputation. No. 509 is the portrait of a charming little girl, dressed for a walk; full face, with golden hair, black dress, and her hands in a sable muff. His great picture, No. 97, is of larger size and higher purpose than most of this artist's previous works. It is called "Diana or Christ," and is throughout painted with an earnestness and completeness difficult to excel in any modern school. The scene is laid at the end of the Stadium at Ephesus, which might have served as an amphitheatre, advantage having been taken of the discoveries made of late years to insure the correctness of the details. A noble Christian lady is brought up before the silver image of the great goddess Diana to show, by the casting of but one grain of incense upon her altar, that she is not a despiser of her whom "all Asia worshipped." She, unmoved by the entreaty of her impatient lover, who is trying to force her to make so small a compromise to the superstition of the multitude, raises her steadfast eyes to heaven, sure there of that comfort and support which can be hers no longer on earth. Even he who loves her, and is beloved, evidently has no sympathy

for what appears to him mere obstinacy and, perhaps, selfish disregard of his own happiness. On the extreme left, the governor sits in splendid apparel; next to him in order, and various attitudes, some of wonder and pity, some of reproach and dislike, priestesses and priest surround the figure of the goddess. One little maid seems, by her earnest attention, to show that she too will, ere long, join the Redeemer's band. At the back, and on the right, are soldiers and others waiting the result of the trial, the man on the extreme right, being a huge Nubian slave, wonderfully drawn and painted. For harmony of colour, composition, deep study, thought, extraordinary finish, and correctness of drawing and detail, this picture stands out as one of the most remarkable in the whole exhibition. Mr. T. Faed's two pictures (Nos. 187, 542) are both pretty. "Where is My Good Little Girl?" is the best. It is, as this artist so often gives us, the interior of a Scotch cottage, with mother and baby seated; she is turning to a little girl in disgrace (who is covering her face with her pinafore), and trying to coax her out of her wilfulness. No. 542 seems to be a protest against the School-board, at any rate, in Scotland. A young wench is sitting at a table writing a letter, when there are heaps of household duties waiting to be performed. Mr. John Pettie's power of expressing character is well exemplified in the single figure of the fly fisherman in "Trout-fishing in the Highlands." "The Landscape," and adjuncts, also, are excellent. We like his "Portrait of John Ballantyne, Esq., F.S.A." (No. 524) much better than the fancy one called "Before his Peers." In No. 537, by Mr. Dendy Sadler, we again have an amusing picture of monastic life, "It is always the largest fish that's lost." A long row of soberly-dressed monks are listening to their angling brother's description of his misfortune in losing such a fish—if we may judge from the distance he is showing by his extended hands—about a yard long. There is plenty of individuality and variety of expression in the different faces. Mrs. Elizabeth Butler's "Defence of Rorke's Drift, Jan. 22, 1879," is disappointing. We seem to lack the vigour of expression and power to which we have been used in her previous works. The colouring, also, is poor, and not always correct. The subject seems somewhat beyond the scope of her undeniably great powers. "St. Ives Bay" (No. 340) is in Mr. Brett's harder style. Its almost photographic accuracy and exaggerated glow are not altogether pleasing. No. 443 is a much better picture, "Golden Prospects." A far expanse of sea, at summer noon, is most accurately and beautifully displayed. It is taken from high rocky cliffs covered with mosses, lichens, and such verdure as the hard stone will sustain. The sweep of the breeze over the twinkling surface of the water is caught with surprising dexterity. His Indian experience has inspired Mr. V. C. Prinsep with the idea of "The Young Solomon." A handsome high-bred Eastern youth, clad in scarlet robes, embroidered with gold, a string of pearls round his neck, and snow-white turban on his head, is shown seated on a silver peacock-throne in calm dignified majesty, betokening one of nature's noblest types. Mr. Prinsep also sends a bright "Indian Palace in the Lake." In addition to the pictures by Mr. J. E. Millais already noticed, we have no less than six other portraits, all of a high value. If we were called upon to express an opinion upon their comparative merits, where all are so far above the average, we should say that No. 86, "Sir Gilbert Greenall, Bart.," bears off the palm. Nothing better has come from the artist's hands. Everyone will be interested in Sir F. Leighton's portrait of himself, painted by invitation for the Uffizzi Gallery, in Florence (No. 119). The President is dressed in his Doctor's robes, with the gold medal of the Royal Academy suspended round his neck. Many will be glad to compare it with Mr. C. F. Watts' portrait of the same gentleman (No. 484), painted in his usual patchy way. It is not a little instructive to see such a comparison of the best work of two such distinguished artists. In each case the likeness is perfect. No. 511 (Miss M. Williams) No. 229 (Miss Baldock), are happy specimens of Mr. Watts' skill. Vicat Cole has several beautiful landscapes and views, especially on the Thames. In the fine view of Streatley he has put out all his powers. A man who could slay a lion as he would rend a kid might also have power to carry him as a trifle; still, surely the story of Samson does not want amplifying as Mr. E. Armitage has done in his astonishing picture (No. 554). Not content with slaying the beast, the swarthy giant is balancing him on his outstretched arms, preparatory to throwing his stiff carcase down a crevice in the rocks. Nos. 222 to 228, also by Mr. Armitage, form a series of small pictures in one frame, apparently for an altar-piece, illustrating the different forms of charity manifested by our Lord. They are of fair average power, and have a good deal of grace and feeling. Sir F. Leighton exhibits more than hitherto. Besides his own portrait and that of Mrs. Stephen Ralli (No. 412), we have two fancy portraits. (No. 1414) "Viola," a young girl with dark brown hair and strongly-defined features, side-face, in white dress and blue bodice; and (No. 1417) "Bianca," a lovely blonde, with golden hair and blue eyes. This is painted upon fine canvas unprepared, and unless covered by glass, we fear so delicate a work as this must suffer, in time, from dirt and cleaning. His most important subject is (No. 197) "Idyll." In a meadow overlooking a far-extending plain, watered by a bright winding river, two beautiful women, the foremost reclining happily upon the lap of her companion, are listening to the pipe of a shepherd, who is seated with his back to the spectator. He is nude to the waist—suggesting a companion study to the "Psamathe" of last year. A perfect harmony of subdued colour pervades the whole picture. No. 49, "Elisha Raising the Son of the Shunamite," is a simple description of a pathetic Jewish history. The dead child is laid on his little bed in the first smile of death, partly covered with a white sheet, and the sorrowing, rugged prophet leans over him, half doubting the possibility of restoring life to his friend's little one. "Whispers" is the last of Sir F. Leighton's works. No. 585, recalling Horace's "Lenes sub noctem susurri," delightful in tone and sentiment, in strange contrast with the commonplace "Sir Roger de Coverley" in Westminster Abbey (No. 584) where the old gentleman seems fast asleep in the Coronation chair. It would be rather a wide stretch of imagination to think the panel, No. 1469, "The Obedience of Joshua," *decorative*, a sculpture in low relief, destined to be "placed as a memorial of the Guards' Chapel, St. James's (*sic*) Park." How anyone could have perverted the noble story of Joshua meeting the Captain of the Lord's host into the silly, fanciful—we had almost said grovelling—thing we have before us, is inconceivable. Even the archæological treatment seems to us absurd. How is it likely that Joshua, lately come out of Egypt with his shepherd people, could have had a 9th century B.C. helmet of the Assyrian type? There is a good deal of merit in Miss Ellen Montalba's "Seven Ravens" (No. 998). Eugene Pavy's "Homeward Bound" is a fine landscape; on a rough, rainy evening a man drives his sheep on before him through country well-wooded with birch timber. In the same room we have, by F. W. Hulme, a quiet summer scene—a backwater at Newark Priory, Surrey, No. 980, the haunt of the kingfisher, fringed by willows and oaks behind luxurious river-plants. No. 981, "Good Bye," on the Mersey, by James Tissot, shows the departure of a big steamer; friends of the emigrants are waving their last good wishes from the deck of a lighter, as it leaves its moorings. "Poetry and Prose" (No. 994) is a naturally-painted garden-scene, by E. H. Fahey. M. A. W. Hunt, in No. 935, has tried, with only moderate success, to catch the splendid hues of late sunset. No. 913, by Haynes Williams, represents a justice-chamber, where a stern old man, with a brass crucifix behind him, dressed in red cloak, a clerk in black as his assessor, is hearing the case against a poor urchin whose first offence has been to help himself to a cake out of the basket of an old woman who, with much gesticulation and clamour, is demanding condign punishment upon the luckless little fellow, who stands with his hands tied behind him. There is too much sameness in the features of figures in "Prince Henry before Judge Gascoyne" (No. 1353). "The Nearest Way to School" (No. 192) strikes us as the happiest of Mr. Hook's three sea-side pieces. The nearest way is along the seashore; but the furthest way round would have got the children earlier to their lessons, as the temptations by the way, of crab-hunting, &c., have altogether put school out of the heads of the young fisher-boy and his sister. No. 258, "Diamond Merchants," is also bright and pleasant; the said merchants being two children with a basket of shells, seaweeds, and other odds and ends, picked up off the beach. "Hen and Chickens," is the title of Mr. Leslie's graceful picture. A charming young woman is playing the old-fashioned game. The expression of the sweet little girl, who, as Fox, is watching her opportunity to catch one of the chickens, is cleverly drawn. Every one must admire the love for simple home-life shown in this joyous scene. All the roses and riches of girl-life in sunny France that we have had painted by Mr. Calderon for the last few years are presented this year in the one grand picture, "The Flowers of the Earth" (161), and an enchanting scene they make. Colin Hunter's pair of water-scenes, No. 548, "In the Gloaming," with fishermen angling in the glow of the setting sun, and No. 558, "The Mussel Gatherers," add fresh laurels to this good artist's reputation. No. 18, "In Doubt," by Ernest Zimmerman, is not without humour. An old sailor and wife are trying to frighten a child by making a dead goose seem ready to bite him, but they only half-persuade him. We must not pass over Mr. C. Stanisland's rendering of the "Relief of Leyden, in 1574." The admiral of the relieving fleet, as he stepped on shore was met by the starving guards, sailors, women and children, and all, without exception, went at once, headed by the Admiral, to the great Church. It is a stirring subject, carried out with much labour and intelligence. There are not many of the scenes from the East of more merit than J. B. Burgess' "Guarding the Hostages." A young prince and princess are under the custody of a villainous-looking soldier who is smoking in front of them. A. C. Gow's pair of portraits, "Dolly" (No. 314) and "Doubts" (No. 310), are good examples of his work. The one is a young lady who has just received a love-letter not altogether satisfactory. The other is a girl shelling peas, happy and free from care. No. 892 represents officers taking leave of the ladies of the Court on the staircase of Hampton Court Palace. There is a good deal of pathos and accurate observation in Arthur Hook's "At Last." A poor old woman is

shown, sitting in patient and half-hopeless expectation for her son at the wars. The moment chosen is when joy comes at last and sets the heart at rest. Her longed-for soldier-son is just coming into the room, accompanied by his delighted sister. Our space precludes mentioning particularly the many excellent portraits and landscapes that abound.

ARCHITECTURE AT THE ROYAL ACADEMY.—III.

THOUGH there is little that is fresh in the present year's collection, the exhibited drawings show a more moderate view of architectural style than we have been accustomed to see, and there is none of that restless feverish desire to produce sensational effects which have distinguished former exhibitions. A few of the drawings show work indeed so absolutely meagre and commonplace, that we are surprised the committee should have hung them at all, unless some arbitrary principle of selection govern them which we fail to discover. For these reasons there is little matter for speculation or criticism, and the critic can only pass an opinion on the relative merits of the works he sees. To resume our notes, we may take two drawings, one showing the interior of the Church of the Sacred Heart, Exeter (1015), by Messrs. Ware and Leonard Stokes, the west-front of which we commented on in favourable terms last week. The architects show a wide nave with a timbered roof and narrow aisles, separated by a light arcade, but this view does not impress us so favourably as the exterior. The other drawing, No. 1014, is a heavily red tinted perspective of a brick church at Southsea, by Mr. Alfred A. Hudson, the position of which, "skied" as it is, rather enhances the effect. The tower, with its pinnacles detached, has a little too acrobatic look about it, and the clerestory appears rather meagre. A French chateau-like effect is given to Messrs. Goldie and Child's "Residence in the Isle of Wight" (1017), in which we find some feeling detail in a Late Gothic style; and there is much that is sensible in Mr. James Neale's "Houses at Walmer" (1009), where the end of one house shows a cleverly-treated open balcony arrangement and hipped roofing. To the raised verandah a flight of steps leads, and the half-timbering of the upper stories is moderate and refined in detail, if there is nothing to charm the admirer of quaintness. The drawing, though neat, is rather feeble. An artistic and homely-looking house, in the picturesque Semi-Dutch style, is 1031, by Mr. Asahel P. Bell; it is quiet, and contrasts rather notably with a few of the fidgetty and ambitious drawings showing chimneys struggling with or piercing dormer gables, bracketed gables, and uneasily-constructed roofs one sees so much of. Mr. Tasker's "Interior of St. Patrick's, Wapping," is an interior more after the basilican model than we generally see; the cylindrical roof is ribbed in panels, and the usual arcade is represented by a row of Ionic columns; but the work little suits ordinary notions of church-building. No. 1038 is a small red-brick study in Queen Anne with a quaint porch; one of the best ink drawings of houses is Mr. Aston Webb's intended work at Ewhurst, a Tudor Gothic design with a bold bay window end and tower, spirited and fresh-looking, without any posing for mere effect, in which stone is the material. More commonplace is a half-timbered work, 1051. In the corner of room is a lofty pulpit and canopy on grey paper, by Mr. Somers Clarke jun, to a large scale. It is a design of a pulpit at St. Martin's Church, Brighton, and the details and outline are pleasing and well proportioned. Mr. E. C. Robins's executed design for the Museum of Sanitary Appliances may be mentioned as a sensibly-treated street-front in red brick, in a kind of "Queen Anne," passing which, and Mr. G. Sherrin's ink-drawing of a house at Weybridge (1070), remarkable chiefly for the gable end and window between chimneys, we come to a large drawing of a premiated design for new "Parochial Offices, Westminster" (1082), by Mr. John E. Trollope, showing a lofty tower and cupola, the effect of which overbalances the structure from which they spring. In this design, conceived in a Renaissance spirit, boldness in the outline dominates at the cost of other qualities. One of the most pleasing stone-and-timber designs is Mr. W. Hay Murray's "Haselhurst, Ore, Hastings" (1079), handled with much picturesqueness; the bay and the plain stone end of house are artistically managed. An undeserved disregard of merit has been shown towards Messrs. Ernest George and Peto's highly-flavoured piece of artistic sketching, design No. 1082, a feeling sepia drawing of a "Coffee-tavern and Hostelry," Newark-on-Trent. The sketch, well worthy a place on the "line," has been "skied," and its quaint detail and picturesque grouping lost to sight. The three gables and bays, and the arched piazza beneath are pleasingly grouped; the composition is worthy alike of its author's taste, and a *mise en scène* the painter might take as a model. The figures and background are full of picturesque character, grouping, and colour. "The Bank, Stamford," by W. Talbot Brown (1091), is one of the few Italian designs in the exhibition. The façade is treated in a bold astylar manner, the ends project over the entrances, and the least satisfactory part of the design are the very heavy cornices, trusses, and detail. To give an official character and to avoid the stereotyped effect is no easy task in Italian design; the work in question has rather suffered in the latter respect. (We illustrate the design by a photo-lithograph this week.) No. 1085 is a pleasant grouping of brick stables, transparently shaded and Jacobean in style, by Mr. J. Brooks. We cannot see what there is of interest in the small, very modest, "Interior of the Parish-room, Crosthwaite, Keswick" (1087), although erected to the memory of a son of the Bishop of Carlisle, to demand the position assigned to it. Nos. 1086 and 1110 are two coloured perspective views of a country-house, "The Warren, Hayes Common, Kent," by Mr. G. Somers Clarke, in which the architect has used bright red brick relieved by diagonal lines of grey colour. The rather garish colouring of these views spoil the quiet breadth and simplicity of the work, which is of Domestic Gothic. The stepped gables are made salient features and some good detail appears, and the work is some relief after the overwhelming repletion in half-timbered and Jacobean designs which occupy so large a space on the walls. Messrs. R. H. Carpenter and B. Ingelow show a large view of their "College at Ellesmere," now building (1095), a work of some importance in a Late Gothic style. The projecting buttresses and the domers are of a *prononcé* character, and will no doubt contribute much to the solid dignity of the building, though the drawing has rather a flat appearance and is not taken from the best point of view for pictorial effect. Mr. W. Talbot Brown's "New Grammar School" (1102) (already illustrated) affords an example of English Renaissance. The disparity in the gables and the upper corbelled pilasters mar the balance of the façade, otherwise simple and broadly treated. Bold in drawing, and well disposed in its gables is Messrs. G. Viger's and Wagstaffe's "Tavern" (1104). We must mention No. 1094, a clever and broadly-treated building for Lewisham Sunday-schools by Mr. G. Sherrin, with a square turret and octagon end, well drawn in effective perspective; and 1105, Messrs. Dunn and Hansom's large "Interior View of St. Cuthbert's, Ushaw College," with a wide-pointed vault, the perspective of which is taken from too central a point; also 1108, a skilfully grouped apsidal ended view of the east end of a church we noticed last week by Messrs. Ware and Stokes, to which the sharp lines and clear drawing add much in effectiveness, and Mr. J. Brooks's pretty and simple church at Ludlow (1111), all works of merit. Mr. J. Oldrid Scott's "View of a Church, Burton-on-Trent" (1115), has a massive and well-proportioned tower and spire and refined detail hardly done justice to by the drawing which represents it. A firm line ink drawing (1120) exhibits Mr. G. Viger's "Hospital for the Deformed, Great Portland-street," a brick building with a pilaster and lofty attic treatment, in a sort of early 18th-century style. The crowding of the dormers and the squeezed effect of the façades detract from the massive Classic style attempted, yet there is a public character imparted. One of the noticeable studies of domestic work is Mr. Edwin G. Hardy's "Eastgate House, Rochester" (1118), a cleverly-drawn sketch of a gabled front, simple and picturesque. Good detail of an Italian kind, with bands of coloured material, is to be found also in 1126, by Mr. Bernard Smith, "An elevation of the author's design for the church of St. Philip." Near the door we see Mr. Walter Millard's able design for a College in brown ink, already given by us, a work showing masterly grouping of the quadrangled buildings and good detail, one of the best works in the room. Mr. S. Harrison's "House at Leicester" (1128) is a boldly-shaded ink drawing, rather spoilt by the chimney. We may award praise also to Mr. Coutts Stone's "Nether Court," a work well grouped and detailed (1121). The large, rather hard, mechanical-looking elevations (1127 and 1131) of "Lahore Cathedral," by Mr. J. Oldrid Scott, show a freely-treated Gothic of suitable character for that important Oriental city in which the traditional forms of Western Mediæval architecture would be strangely out of place. No. 1138 is a large heavily-treated elevation of "An Entrance to Holloway College, Egham, Surrey," by Mr. W. H. Crossland. The tympanum of the curved pediment with the sculptured figures, which, by the way, look rather out of scale, is the chief feature, but the design suffers more from the heaviness of the colouring. Mr. R. W. Edis's additions to the "Inner Temple Library" in progress (1140), a masterly drawing in colour, shows a pleasing brick front, with oriel windows, in a Domestic Gothic style, harmonising with the old buildings; and the same gentleman's coloured drawing (1144), "The New Mansions in Victoria-street," in which Renaissance has been handled with some freedom, though the strips of brick pilasters to the bays and gable give a weak and frittered effect. No. 1141 is a tower attached to a gable end of St. Michael's Church, Camden Town, by Messrs. Bodley and Garner; the former is excessively massive in treatment, but will form a striking addition, the upper stage being emphasised by vertical buttresses of masonry. A vigorous ink drawing is Mr. A. W. Cross's "Residence, Hastings" (1117), and Mr. W. Young's "Design for Municipal Buildings, Glasgow," an Italian façade, columnar and balanced with a central cupola, may be noticed as one of the few purely Classic works. In Towers, Messrs. Ball and Goddard's (1056) design for one at Handsworth Theological College is forcibly drawn. The details are good, the machicolated parapet and pinnacles look rather heavy. Two characteristic ink drawings appear (Nos. 1027 and 1040) of houses erected on the Bedford Park Estate, Turnham Green, one by Mr. E. J. May, and the other by Mr. Maurice B.

Adams; we may also mention No. 1045 as a well-grouped, quiet work by Mr. W. West-Neve.

In glancing over the decorative designs of the year, we find here and there a gradual return to the purer forms of Classical composition, both in drawing and colour. We cannot speak in unqualified praise, however, of Mr. G. A. Storey's "Design for Ivory Door" (1012). The figure panels are rather tawdry in colour, and the honeysuckle inlay a little coarse and overdone. The former illustrate Music. Messrs. Crace and Son send a drawing of coloured decoration to the Mercers' Hall (1059), also extremely heavy in the architectural proportions, and overbearing in colour. The pilasters and panels are coarse, and their capitals too high; the red paper and the Italian woodwork look probably better in execution than they do here, but the wall-paper kills the lower detail. The decorative arrangement proposed by Mr. G. E. Fox (1063) is more pleasing; the colours are cooler in tone below the dado and frescoes, the roof-timbering being enriched by red. Mr. Owen W. Davis (1068) falls into the garish and extravagant in the choice of a tawdry French style, and there is an unpleasing want of repose in the work; it is scarcely a dining-room style of decoration. Much quieter, and in a happier scale of colour, is Mr. T. Hall's design for decoration for a hall; the festooning on a bluish-green is relieved by rose colour in the gallery, but the gradation is not very good. Mr. W. Young's interior study (1062) is too high hung to examine the detail; the recessed fire-place and arched cove is curiously treated. Designs for painted windows are worth a passing notice. Mr. W. G. Taylor and W. J. Griffiths exhibit a "Window in St. Paul's Cathedral" to commemorate the recovery of the Prince of Wales, of Renaissance design, showing good colouring, also No. 1143; and we may mention a design for west window and frescoes for a church at Beckenham (1125), by Mr. E. Frampton, with figure-subjects in the lights; and another by Mr. E. H. Jewitt, showing the "Ascension" No. 1028, a "Study for Decoration of Chancel-arch of the Assumption, Kensington-square," by N. H. J. Westlake, is a clever composition in design and colour. Mr. J. D. Sedding (1023) also shows a reredos in a large line drawing, rather wanting in the scale of figures. Horizontal lines certainly predominate, and break up the design in Mr. A. J. Gibbs's design for an east window (1113): and close to this we observe a study of drawing-room decoration, by Mr. W. Lane, rather heavy in the arrangement of overmantel. Mr. P. H. Newman reproduces his careful study of spirit fresco in St. Peter's, Belsize-square, we have before favourably noticed: and Messrs. Crace and Son, a handsomely-designed and coloured ceiling, with blue ribs on a buff ground (1117) at Longleat.

A few excellent drawings of old work claim our notice. Of these we may name Mr. F. W. Richardson's "Old Chimney-piece at Kenilworth Castle" (1036); a masterly oil-colour drawing by H. W. Brewer, showing the "Gates of Henry VII.'s Chapel" (1064), rich in detail and depth of tone; an interesting old timber and stone house of the 15th and 17th centuries, the "Birthplace of S. Crompton," by John B. Gass (1076); two clever coloured sketches (1025 and 1026) by Mr. Aston Webb, one of very effective brick groining: Mr. Holland's sketch of "Old Neptune Inn, Ipswich," a charming bit of old woodwork; a charmingly fresh and simple sketch in colour, by W. R. Lethaby, of "Tower of St. Nicholas, Cöln" (1074), and a sketch of "External Staircase at Lubeck" (1022), of Renaissance work. In terms of commendation we may also name 1077, a well-studied detail elevation of Classic orders, by A. Frampton, refined in colour; 1096, R. W. Collier's prize drawing of an "Interior of an Exchange," a skilfully-shaded sectional view previously noticed by us; No. 1078, already given; Mr. T. J. Green's half-timbered Late Gothic house (1103); a Flemish Gothic sketch (1035); Messrs. Hadfield's well-coloured Tudor archway (1050); some feeling decoration (1132); Arthur Baker's "Church at Hammersmith" (1130), with central Scandinavian-like tower; and G. Nattress's heavily-coloured interior sketch. A rapid review of the collection suffices to show that while of domestic architecture every phase of style is represented, from Late 14th century through the Tudor, Stuart, and Hanoverian times—even the school of the modern "Æsthetes"—Classic design is almost entirely absent, and of monumental buildings there is scarcely a drawing to be seen on the walls of the Academy this year.

ART EXHIBITION AT THE ALBERT HALL.

THE Fine Art Exhibition of paintings, sculpture, and architectural drawings, opened to the public last week at the Royal Albert Hall, South Kensington, represents the work of a considerable class of artists whose pictures have not been hung at the Royal Academy for want of room. Nearly 200 selected works have been thus afforded space in the upper gallery of the hall, and the public have now an opportunity of judging of the qualities of some of the rejected contributions, though it must not be supposed the best of the rejected works appear here. It would be impossible to say the collection is equal to the anticipations we had formed, for a great deal of rubbish has been hung, and there are many pictures which ought not to have been admitted, besides a want of discrimination evinced in the hanging. The architectural drawings have, this year, dwindled down to a very small number, and one small bay of the gallery contains them all. Such as they are, these drawings do very inadequate justice to the architectural profession, and we think some of them would have been better unhung. The best pen-and-ink drawings are (No. 541) a view of St. Michael's Church, Whitehaven, a boldly-executed perspective, with large tower and porch at west end, in a Late Gothic style, by Mr. C. J. Fergusson, F.S.A.; and some cottages at Stoke Bishop, Gloucestershire, by Mr. E. Gabriel (543). A large view of additions and restorations to Edgeworth Manor, in the same county, is exhibited by Mr. C. N. Tripp (546); and a conspicuous place is given to a large ink interior drawing, in very indifferent perspective, of one of Mr. Street's best brick churches, St. John the Divine, Kennington. The artist is Mr. P. Childs, who has taken his view from the easternmost bay of nave; but the lines of apse, the acute points of the nave arches, and especially the capitals, are very queerly drawn and spoil the subject. The shading, too, is crude and hard. One of the best drawings is a carefully and highly-coloured elevation of a suggested completion of the Campanile of Santa Maria dei Fiori, Florence, by Mr. H. H. Statham, a drawing indicating some study of Giotto's great work, though we take exception to the weak spiral angle pillars carrying the spirelets over the octagon angles. Mr. G. Carelli also sends two bold and effective water-colour interiors, one "A Room in the Palace of the Doges" (526), and the other "Nicene Council in Baptistery of Cathedral, Siena." Mr. J. F. Wadmore has another coloured drawing of a part of garden front, "Feroy Hall, Tunbridge," a trifle too glaring in the red bay; and near this is a rather simple treatment of houses facing the sea at Worthing, by G. Truefitt (531), in which a conical tile-roofed turret is made a feature at the corner; the drawing is coloured. "The Interior of Holy Trinity Church, Penge," by Mr. E. F. C. Clarke (535), is well coloured, also a view of "Willesden High School," by Mr. H. Hall. We can also speak commendably of Mr. G. Bruton's "Grange, Little Tew, Oxon" (illustrated by us); a wall paper (550), and a large study of interior decoration, we have seen elsewhere, is exhibited by Mr. W. Hensman. Mr. A. Baker sends also interior view of his "Church at Hammersmith." We hope on another occasion to see a little more care exercised in the hanging, for it is far too clear that the drawings have been hung by a committee quite incompetent to judge of architectural merit.

In the 25 odd bays devoted to oil-paintings, we notice several pictures of merit. No. 61 "On Tramp," by Mr. A. J. Black, is a large sombre picture, which tells its own story truthfully. The tramps lying down on the roadside and the dark evening are painted with effect. A very brightly-painted subject is Mr. R. L. Aldridge's "Troubadour" (65), well finished in the Spanish dress and accessories. No. 68 is "A Winter Scene," by Mr. C. Brockman, cleverly handled as a landscape; and we remark also a large picture, by A. de Breanski, in his usual naturalistic style, No. 80. "The Lily or the Rose" (85), is an ably conceived composition by Mr. R. Bateman: the steps and the figures of the maidens with their typical emblems, are well painted. In Bay 8 we pass a pleasing portrait by Mr. F. M. Skipworth, and a touching study of a swarm of ragged children on a doorstep, by Miss Jane Style, 107, cleverly grouped and well coloured, intended to point a moral of the social condition of the poor; 109 is a deftly-painted vernal landscape, in a low, soft tone of colour, by Mr. C. France; the birch-trees and bank of stream in which are feelingly rendered. Admirers of *genre* subjects will find some conscientious painting in Mr. Wardlaw Laing's "Spinster" (115), and in Mr. P. H. Miller's "Debate on the Budget" (124). "Psyche," by Mr. A. Ward, is a finely-conceived conception, taken from Morris's "Earthly Paradise." Mr. A. Wardle's study of a bleak moor (131), Mr. Henley's "Waiting for the Axe" (137); No. 152; Mr. S. Herbert's fine Welsh subject; Mr. Gouldsmith's "View near Bristol" (159); and a humorous incident of the inquisitiveness of servants, by J. Carolus (164), will all bear inspection. "Day Dreams," by Mr. F. Slocombe (170), we have seen before; there is some nice colour in it, and the recumbent figure of the young lady on the couch is well drawn. In bay 14 is a large picture representing "The Trial of a Noble Family before the Blood Council, Antwerp, 1567," a scene suggested from Motley's "Rise of the Dutch Republic," by Mr. Sydney Holland. The figures of the judges seated at the table are drawn with skill, and indicate the character of the tribunal before whom a family—father, a son, a young wife and child—are pleading. A large solidly-handled subject of foliage and stream is shown by J. Finnie (181), and we may notice approvingly No. 191 by Mr. R. L. Aldridge; a boldly-painted large landscape with cattle, by Mr. W. H. Pigott (196); an imaginative subject by W. J. Callcott (197); No. 199, No. 207, pleasing *genre* pictures; No. 206; a clever solidly-painted subject, "Michaelmas Tide," by Mr. J. L. Gardner. "A Gleam of Sunshine," by T. W. Allen, affects the impressionist style; as regards No. 314, it is very crudely painted, and the curious legend depicted by Isabel de Steiger, (308), three Valkyrior maidens proclaiming from a lone rock, might be put down as a rather meaningless picture of three very ordinary half-draped maidens perched on a sea-girt eminence. One of the best oils is in Bay No. 22 by J. Tissot.

The water-colour drawings comprise a few creditable productions. We especially no-

tice Mr. G. Ferrari's vigorous drawing of "The Wayside Cross" (417); T. Kell's large bird's-eye view of Southampton (427); showing the docks and New Forest; No. 437, a nice sketch of Church-street, Windsor, by Mr. C. T. Hollis (436); Mr. J. Curnock's "Snowstorm Scene" (412); the boldly-handled rocky scene by the same artist, 445; the birch-trees in Mr. Wheeler's "Leigh Wood," 452. Such a feeble drawing as 444 would have been better excluded, and No. 413, a large picture of the *Bellerophon* and a squadron exercising sail drill, with its glaringly blue sea, might with advantage have given place to better drawings. The series of water-colour copies of works of the old masters, lent by the Duchess of Edinburgh, executed by M. Stohl, is a valuable one, and comprises figure subjects and Scriptural compositions by Murillo, Guido, Raphael, Da Vinci, Titian, Paul Veronese, Rembrandt, and other masters of the Italian, Spanish, and Flemish schools.

Sculpture is represented by a few marble terra-cotta groups and busts by Prof. F. F. Altini, Messrs. Malempre, J. Throp, A. Fontana, S. Ruddock, Nina Palmerina, and others. Mr. Fontana's bust in terra-cotta of Miss Ellen Terry will be acknowledged a good likeness, and Mr. H. Stannus's plaster model of a "Reading Boy," the original of which adorns the forecourt of the Essex-street Chapel, may be again mentioned as a work of skilful modelling and intellectual expression.

THE GENERAL CONFERENCE OF ARCHITECTS.

WE complete this week our detailed report of the recent Conference of Architects, by a notice of the proceedings on the closing day, Thursday.

DOULTON'S POTTERIES.

In the morning a party of about a hundred architects visited the works of Messrs. Doulton and Co., on the Albert Embankment. The visitors were conducted by a member of the firm over the works and showrooms. The receipt of the raw materials in the yard, the grinding by machinery, the "wedging" of the clay by boys to extract the air and impurities, the "throwing" on the wheel and turning to a true face in the lathe, were successively witnessed, and in the roaring kilns in the centre of the premises it was understood that the finished products were being fired. The most interesting portion of the visit was the inspection of the decoration of the ware, which is executed in the partially dried clay, carried on in the rooms above. About 200 young women, and a few skilled modellers are employed in this work, under the direction of Mr. Rix. In each room six to ten girls are employed in one of the processes, under the supervision of a lady artist, who is herself occupied with work of a higher and less restricted character. The principle acted upon is that the scheme of decoration shall be indicated and the highest class of work carried out by the principal artist, the execution of the subordinate ornament being delegated to the assistants. In some of these rooms patterns were being pencilled on and then incised into the surface of the jug to be ornamented; in others, small points, discs, and bosses, leaves and flowerets, were stamped in clay and applied in decorative lines to vases; in others, parts of the patterns were being brought out by colour, the pigments being clayey solutions of closely-allied drabs and greys, unsuggestive to an untrained eye of the ultimate brilliant appearance when fired; a higher form of work was seen in the *pâte-sur-pâte*, where a second clay in delicate forms and outlines was being applied to the modelled surfaces by highly-skilled workers. In one of the rooms, the Misses Hannah and Florence Barlow were seen at work; the former lady was executing paintings of finches and other birds, by the *pâte-sur-pâte* process in coloured clays, while her sister was etching out upon a vase a group of Suffolk cart-horses, in which by a few rapidly-drawn lines the peculiar heaviness and strength of the animals were pourtrayed with accuracy and spirit. In another room Mr. Frank A. Butler, a deaf and dumb artist, was keeping four assistants busy by sketching the first portions of interlacing disc patterns on vases, which his assistants completed. Mr. Butler opened several cupboards, filled with finished work, all marked by originality and variety of treatment, and also showed vessels which have been compressed into forms other than circular. In yet another department, Mr. George Tinworth, whose works have been familiar objects at recent Academy Exhibitions, was seen at work surrounded by specimens modelled in the clay and fired, of his terra-cotta figures and plaques. He was, when the party entered, employed in undercutting a large panel of the "Crucifixion" for Earl Brownlow, and close by was a finished and well-burnt panelled figure, in high relief, of the youth David, sling in hand, and trampling on the prostrate Goliath, on the inner side of whose shield was the inscription, "Where is boasting then? It is excluded." Beneath was the motto, "The Battle is the Lord's." The panel, which is of considerable size, and is executed in a very pale, almost stone-coloured terra-cotta, will form the central portion of a memorial to the officers and men of the 13th Light Infantry killed in the South African campaign of 1878-9, to be erected in Wells Cathedral. Mr. E. B. Ferrey is the architect. The visit evidenced to the members of the Conference that Messrs. Doulton are anxious to encourage as far as possible the development of the originality of the actual artist, variety being aimed at in every way. No machinery is employed other than the thrower's wheel, and no mechanical reproduction or duplication is permitted. The individuality of the artist's work is further promoted by the signing in monogram of every piece of art-ware, and the prominence accorded to the name of any specially talented or skilful worker. The artists are chiefly recruited from the students at the Lambeth School of Art.

The members of the Conference also visited the showrooms erected for Messrs. Doulton facing the Embankment. In the sanitary department, were seen a great variety of appliances in their stoneware. Amongst the more recently introduced contrivances seen were their aërating filter, in which a ball-cock shuts out the supply of water at stated intervals, so as to insure intermittent action and re-supply with air in the filtering substance; the high-pressure ball-valve cisterns, in which the water is shut off by an equilibrium valve, and to economise space the ball-cock is kept very small; a grease interceptor, a stoneware receptacle placed beneath the sink, in which the outlet is on the siphon principle, and there is a 3ft. run of water. There were also seen a great variety of anti-percussion high-pressure taps, with bib cam, horizontal, and press-down actions, in all of which the principle is adopted of making the block sufficiently loose for water to pass between block and piston, so as to avoid sudden check to head of water when the tap is turned off. In order to meet the requirements of water companies, a new form of waste-preventing bath apparatus has been devised, and is being introduced, in which the pulling up of the waste plug raises a lever which renders it impossible to raise either the hot or cold water plugs, and the moving of either of these in like manner closes the discharge pipe.

In the Art department were arranged specimens of the various products of the artists; terra-cotta work of many sizes; Doulton ware, in which the clay is decorated in the soft state, and is then but once fired with salt-glaze; the Lambeth *faïence*, in which the work is fired, the design bitten on the biscuit, dipped in liquid glaze, and refired; and the silicon ware, the most recently introduced and the cheapest, in which the colours and patterns have a peculiarly soft appearance, from the absence of glaze. This, like the Doulton ware, has undergone but one firing.

HERTFORD HOUSE.

In the afternoon a visit was paid to Hertford House, Manchester-square, where the members were cordially received by Sir Richard Wallace, Bart., M.P. The principal apartments of that stately mansion were thrown open to the visitors, and their valuable contents were inspected with much interest. Hertford House, formerly called Manchester House, occupies the principal area on the north side of that square, and was originally built by the Duke of Manchester in 1776. It was afterwards occupied by the French Ambassador. The late Marquis left the property to Sir W. Wallace, who has lately considerably added to the old house. The additions of new wings and an extensive series of galleries inclosing a quadrangular court in the rear, now laid out as a small garden in a French style, besides a remodelling of the old house, have increased its capabilities internally, though the heavy brick front and commonplace dressings of the front towards the square do little to recommend it externally. Ascending a grand staircase, having a central flight of marble stairs with massive scrolled balustrading, relieved by gold, the chief attractions are the fine oil-pictures which adorn the panels round the upper part of the staircase walls. These are of classical subjects by a French master of the time of Louis XV., and are fine compositions, both in grouping and richness of colouring. A magnificent suite of apartments were then entered, comprising the drawing-rooms. The first one contained some finely-painted pictures by Sir Joshua Reynolds, Gainsborough, and the decorations were chiefly of light green, white, and gold. Another finer room, with a remarkably rich Boule chimney-piece, contained some choice pictures by Watteau Père. Several cases of valuable china, and various cabinets of the time of Louis XV., and throughout this and the other apartments the whole decorations and furniture belong to this and the succeeding age. A few rare water-colours by Descamps, J. W. M. Turner, and others, drew notice. An oval apartment, forming the central room of the suite, and lighted by a large bow facing the garden, was scanned with much curiosity and interest. A case of beautiful gold-chased and enamelled snuff-boxes was particularly admired, and a collection of miniature portraits. Specimens of Velasquez, Murillo, and other old masters were hung on the walls of another spacious apartment; after these were inspected the visitors passed into a large gallery forming one of the new wings, and containing a very complete collection of Oriental armour, embracing specimens of helmets and shields, suits of mail, scale-armour, Moorish daggers, firearms; many of these are richly decorated with inlays and engravings. Some of the blades and handles of the swords are enriched by damascene ornamentation or niello work of the most intricate and lace-like patterns. The return and corresponding wing in the rear comprises French, English, and German armour, in which full suits of armour of plate iron of the 14th century are to be seen, but of much plainer workmanship, engraved and chased work, or hammered and repoussé ornament, being chiefly noticed. The tournament helmets and breast-plates are very fine examples. The east drawing-room facing the square is replete with modern French decorations. Among the pictures we notice examples by Landseer and Sidney Cooper, Wouverman, some richly-tapestried couches and chairs with gold frames. The main picture gallery occupies the west side of garden, and is connected with the house by the armoury galleries. This is a very large apartment, lighted from the top by a glass ceiling, and laid with parquetry. Among the many works of the old masters are paintings by Gainsborough, Sir J. Reynolds, N. Berghen, J. Bothe, Ruisdael, Ostade, Rembrandt, Van-de-Velde, Wouvermans, Murillo, Rubens, Potter, and others. A very fine "Nativity," by Murillo, and a grand picture representing the Descent of the Holy Ghost, by Phillipi Champaigne, are to be seen here; nor must we omit to mention a fine interior by E. de Witt, and some sketches by Rubens, full of animation and colour. In this gallery is a writing-case with silver-chased corner-plates, which belonged to Charles II., and a superb beautifully finished inlaid and gilt bureau, by Reisener probably, with ormolu figures and clock. We also noticed a very fine interior, by David Roberts, some choice cases of medals, and a casket of pure buhl-work of unique shape and design. Sir R. Wallace's collection is rich in gilt bronze furniture, such as Gouthière work, made in Louis XVI.'s time, and we meet with choice specimens of Riesener's cabinet-work, to be found in no other collection in England. Passing to the ground-floor, the visitors were regaled by refreshments served in a spacious apartment or buffet lined with blue and white tiles opening into the garden. The 16th-century room, as it is called, in which the collection is chiefly of that date, contains a few excellent carved oak cabinets with traceried fronts, and some rich painted china. The "Canalletto Room" was then entered, hung with very valuable pictures of Venetian views by that painter,

and filled with rich French-made cabinets, and damask satin chairs of Louis Quinze style. The front room is hung in red damask relieved by gilding, and has some very fine specimens of Boule-work; another is decorated with white and gold pilasters and panels, furnished with costly gilt chairs covered in damask. Afterwards the bay room behind the hall, the dining-room and billiard-room were in their turn inspected. As a collection of the highly decorative furniture which was prevalent in France from the time of Louis XIV., to the 18th century, and as a gallery of French and other schools of painting, Hertford House is probably without an equal, and the members to the Conference who were fortunate enough to pay it a visit, will remember it with far greater pleasure than their visit to Buckingham Palace.

In the evening, the concluding meeting was held at the Institute rooms, the President, Mr. G. E. Street, R.A., taking the chair for the first time.

MURAL PAINTING AND THE GAMBIER PARRY PROCESS.

Mr. FORD MADOX BROWN read a paper on this subject:—My experience of mural painting is not (the author said) very great, nor of long standing. Three moderate-sized panels are all that I can boast of in this direction; I began the actual painting of them little more than two years ago, but I have been thinking on the subject all my life. I will confine myself to the technical and practical side of the matter. There are twelve panels to be painted in the large meeting-room where I am at work in the Manchester Town-hall. Each panel is rather more than 10ft. long, by somewhat less than 5ft. high. They are not quite 5ft. from the ground. They are thus not very dissimilar from pictures on the line in an exhibition. Each panel has a window directly over it, and one facing it. On fine days there is plenty of light, but in the short gloomy days of winter, the paintings are best seen by gaslight, on festive occasions, when the hall is brilliantly illuminated. At my recommendation, that process (of Mr. Gambier Parry's invention) known as "spirit fresco," was selected. Meanwhile, however, the spaces had been filled in with a compound of lime and marble dust—fine and hard. Mr. Parry, in his pamphlet called "Spirit Fresco Painting," recommends a stucco composed of two parts of pure river sand to one of well-slaked lime. I do not fancy the change of sand for marble-dust would have, in itself, caused much difference, had not the plasterer trowelled the surface far too smoothly—till it was like ivory, in fact. To remedy this, I had the faces of the panels cut down with grit-stone, and to increase the absorbency it was, before receiving the first preparation, well heated with a gas apparatus contrived for the purpose. One of the distinctive features of Mr. Parry's invention, compared with the somewhat similar methods in use on the Continent, seems to be this coating of the wall, before painting on it, with some of the same medium with which the colours are ground. This preparation, which should be applied not long before the actual painting is commenced, arrests the too great absorption of the medium out of the colours into the stucco, which might end otherwise, as with Leonardo's oil-painting on plaster, in the total pulverisation of the colours on the surface. Also this medium, which consists of wax, copal, and gum elemi, is, after drying, still susceptible, even for a considerable time, of re-solution by the spirit or essence of lavender with which it is first compounded, so that the fresh colours laid on the surface are constantly re-moistening and assimilating themselves to the medium already absorbed into the plaster, thus, so to speak, striking roots there. In France and Germany, where a process, if not exactly identical with the Gambier Parry one, at least in a great measure analagous to it, is now superseding the old Italian fresco, they do not coat the wall first with medium—at least, so I am told. This is cheaper, but also less scientific; but when we consider the time which these works are expected to last, we should not be niggardly in their preparation. The surface of the old Italian fresco is very beautiful, with just that even semi-gloss which, for a wall, is so desirable, looking well from every point of view. The difficulties and hindrances in its execution, however, are such, that I question if many who have once tasted the sweets of the Gambier Parry fresco would think of returning to the older one. Then there is a *sine quâ non* with regard to the painting of walls in this climate—in this smoke-bedimmed country—a consideration not to be overlooked, and expressed in the prudent housewife's inquiry, "will it wash?" To my own experience the Gambier Parry fresco will wash. I have tried soap and a nail-brush on a small specimen before beginning on the wall itself, and it looked as well after the operation as before. Italian fresco, whatever they may say, *will not wash*. The relative claims of stereochrome (water-glass) with Mr. Parry's method remain to be considered, but I will return to their consideration later. Mr. Parry, I understand, can point to examples of his process of twenty-five years' standing in England. I have myself, not long since, inspected the French paintings, much in this style, by Hyppolite Flandrin, in Saint Germain des Prés at Paris, and they did not seem to me much changed since the day when I first saw them thirty-six years before. As to the facilities for working the colours, and executing different textures and appearances in Mr. Parry's process, there seem to be practically no limits to them. Every proceeding that is applicable to oil, or water-colours, or fresco, is easy of attainment in this spirit-fresco, and, what is of great importance, every colour may be used in it. Depth of tone and brilliancy in the lights, the utmost transparency with the height or very impudence of *impasto*; all varieties of glazing, scumbling, retouching, or stippling, nothing seems to come amiss to it; and though certainly, if the portion in hand can be finished off at once, it will, when dry, look neater—as, indeed, is also the case in oil or water-colour—yet as the drying process is never complete on the next day, the work can, if necessary, stand over till then. This, at least, is the charming experience of the first five or six weeks' work. But after these are past, and the portions first painted have commenced drying in earnest—then a further experience is gained; and the one quality which more than any other quality becomes a desideratum in the work, is strength. To paint strongly and warmly, and, more than ever before, transparently in the shadows, proves, in fact, to be of most imperative necessity. For the colours, after a certain duration of drying, become cooler and lighter and more opaque, and ever as the months go on, paler and more opaque; so that one cannot too resolutely grapple with this tendency. This is, indeed, one of the chief difficulties of the process, and one that at first caused me some discouragement, till I got into the way of meeting it. The other, and the only other drawback that I have experienced in this mode of painting, consists in the tendencies of several of the colours to dry in different degrees of glossiness. For instance, ivory black will dry perfectly dead compared with every other pigment on the palette. When you walk past your painting, as the opposite windows faintly reflect in the gentle gloss of its surface, every touch of ivory black tells out like a hole in the wall. Other colours have a tendency to shine too much. Now, the plan I have adopted to secure evenness of surface is that of touching the offending parts with a wax varnish, the instructions for making which are in Montabert's well-known treatise on painting. It is a recipe that I have stored in my memory for thirty-six years, and I should be much beholden to Mr. Parry if he will either sanction it, or invent us a better one. Now, I cannot insist too much with you, gentlemen, on the desirableness of wall-painting being uniform and beautiful in surface. With easel pictures it is different, for no one at all used to them would look at them from a wrong angle; but, in spite of yourself you must view a mural painting from every angle and situation. Baron Leys, the great Antwerp painter, so well recognised this that, in his decorations in the town-hall of that city he employed water-glass for the wall facing the windows, though for the two end walls of the same room, as also for the decorations of his own dining-room, he used gutta-percha oil,—something, it would seem, very like spirit-fresco medium. There can be no doubt that water-glass, properly used, not recklessly squirted on (as our Maclise employed it, in the impatience of his great genius), forms the most beautiful and unbroken surface of any,—not even excepting Italian fresco, where the necessary egg-retouchings can always be detected; and stereochrome has this advantage over spirit-fresco, that while the paint in that process grows gradually weaker, in water-glass the final aspersion, to use Maclise's own words, "has the enhancing effect of the shower on the rose, dyeing its native hue of a deeper, richer tinge." But in Germany, the very country of its invention, water-glass seems to be now given up; so we must needs be content with our native process, and I for one feel nothing but gratitude to Mr. Gambier Parry for the years of labour he bestowed on his experiments, and the advantage to art in this country. I will conclude with a few observations,—first, as to the kind of wall-spaces best fitted to receive paintings; and lastly, on the choice of subjects suitable for them. The idea of a picture being naturally a movable object, and one inclosed in a frame, is so wedged into and imbedded in the English mind, that though here it may sound scarcely credible, I can assure you I have been asked more than once by persons seeing me at work at Manchester, "where my picture was to be hung when finished." The fact was, that the naturally recessed panels under each window, between the richly-grouped vaulting-shafts on either side, suggested to the ordinary mind the pictures they were wont to see round rooms. Now, I do not for an instant mean to infer that such spaces are not naturally fitted to receive paintings, but I would urge that they are not the only spaces fit to be painted, and that all spaces need not necessarily be sunken panels. To my mind, to complete the decoration of this great hall, it will ultimately be desirable to paint not only these twelve panels under the windows, but the vacant irregular spaces at the two ends of the room—one, a magnificent arched space about 40ft. from the ground, over the organ; the other, a long, irregular space over the two main entrances, and cut into by them. The idea of pictures round a room would then be done away with, and the mural decoration of the hall perfected. I remember years ago, a company of young artists so impressed with this principle, that in their enthusiasm for a set of spaces, high up out of sight, and each with a couple of circular windows cut in the middle of it, they volunteered to paint the whole gratis—and did so! But there may be a medium in perforating your pictures. The best spaces for painting are such as have no immediate deep ledges to shade the edges of the composition—spaces of any shape that seem otherwise useless, and, if possible, spaces where the sun does not reach, for while I am at work at Manchester this same sun, decked in a little brief authority (fortunately very brief), plays, momentarily, such tricks with what I am painting, as might make St. Luke himself weep. As to choice of subject, it cannot be too often impressed by the architects on those in authority that it should be left to them and the artist in combination. A fine event, morally or historically (let us say "The Peace of Utrecht"), does not necessarily make a fine painting; on the contrary, "The Peace of Utrecht" can never, as a picture, be but a number of men assembled together in a room, and yet to get fine painting is the chief business. Then, again, if they will urge on the painter events requiring too many figures, it may prevent his doing justice to the work; he cannot render the expulsion of the Danes in three lines, as Hogarth drew the soldier and his dog passing through a gate. One subject they would have wished me to paint at Manchester was the opening of the Town-hall itself, with a procession of *forty thousand people, five miles long*. On the other hand, the painter should himself be reasonable, and not *too poetic* in his imaginings. "Eros reproaching his brother Anteros for his coldness" may be very pathetic, but scarcely to the tastes and comprehension of a Lancashire clog-wearing community, and the poorest and most illiterate of the ratepayers have to be thought of. The subjects chosen for the Great Hall are representative of the history of Manchester, from the time of the Romans to the present day.

THE COLOURED DECORATION OF PUBLIC AND PRIVATE BUILDINGS.

Mr. J. D. CRACE read a paper under this title introducing his subject by a reference to the distinction to be observed between the internal treatment of a public and a private building; in the latter the decoration was only one element of the ultimate result in colouring and effect, and was to accord with the furniture, carpets, and

draperies; in the former, the colouring must be independent of accessories, and must possess a greater breadth of effect than would be called for in a house. He defined as the proper aims of decoration:—1. To express or emphasise the best forms and proportions of the structure. 2. In the absence of structural expression architecturally, to compensate for that absence. 3. In some cases to correct proportions which, from whatever cause, appear unsatisfactory. 4. To explain surfaces and contours. 5. To add interest of detail or richness of effect. Although transcendent power in the artist might excuse the want of strict adherence to these legitimate aims, the disregard of them always added enormously to the difficulties of the boldest and most skilful. Even our enthusiasm would usually allow that disregard to laws founded on common-sense had not been a real gain to genius. The most splendid exceptions (such as, for instance, the Sistine Chapel) proved the rule, for some expression of structural lines would have been a clear gain to the work. In dealing, then, with an interior, let the decorator first put to himself these questions:—1. Had it constructive features clearly expressed? And did they, whatever they were, lend themselves to a satisfactory explanation of good proportions? 2. Did the conditions of light, perspective, or other outward circumstances make it desirable to give additional force to this expression; did the features themselves lack strength, and, therefore, need support; or, on the other hand, were they somewhat heavy, and, therefore, need reduction or subduing? 3. Or, again, were there no structural features to deal with? Was there an absence or insufficiency of moulded surface, so disposed as to assist the eye in its instinctive search for structural lines? Then the decorator must seek a method of supplying the want—not necessarily by substituting colour for mouldings, where mouldings might have been; but by providing paths, or stepping-stones, by which the eye might traverse the surface pleasantly, willingly, and by such routes as to discover for itself those charms of proportion, of harmony, and of art which might be there. Having been able, the lecturer continued, to answer the first question affirmatively—that is, having found constructive features well explaining the good proportion of the interior, the colourist will take care that all that he does shall preserve those features, and keep them well in the mind of the spectator. Should they run a risk of escaping attention, either by reason of want of light, or through the presence of other attractions for the eye, he will duly emphasise them by placing them in sufficient contrast to the intervening spaces; and this not necessarily by brilliancy of colour, but by attention to the distribution of light and dark. It will usually be desirable to keep the same apparent force of relief throughout these features, increasing the emphasis where the circumstances tend to allow of the eye wandering at random. If, however, the constructive features appear poor and inadequate, colour affords the means, in many cases, of restoring to them breadth or vigour. In buildings erected when the use of colour was a matter of course, many of the leading constructive lines would appear thoroughly poor and insufficient if unassisted by colour. I need only mention the ribs of the vaulting of the early Italian churches. In the majority of instances these consist of a single roll, or chamfered square, dividing the whole bay into four parts if the area be rectangular, or in the simplest available way if polygonal. They are made sufficient by the painted borders which support them on either side, and connect them so intimately with the pictorial or other coloured decoration of the spaces that the two appear thoroughly a part of the same scheme. If the proportion of rib to panel be inadequate, the border is coloured with some decision, or toned to accord with the rib; but if the rib be adequate the tones of the border ally themselves with the decoration of the panel or space. Coming to the third question—the absence of structural emphasis by moulded surface—we may observe that when coloured decoration is to be a leading feature of an interior, moulded surface may, to a very large extent, be dispensed with. The fewer and simpler the mouldings the better will they bear treatment in colour. Where "mosaic" alone is used for the internal decoration, the finest examples are totally without mouldings. Their place is taken by coloured borders, so defined as to serve the same purpose. In order to admit of these being used where they are, in fact, indispensable, all the cornices are rounded off, and this rounding has the advantage of insuring some play of light on the gold. The treatment of gold grounds, whether in mosaic or not, demands considerable care. The great value of gold in decoration is its "sympathetic" quality. More than any colour is it sensitive to the influence of adjoining colours, and it is this which makes it so valuable an adjunct to coloured decoration. A red or warm outline, or border, will impart a warmth to the whole gold ground; whereas, if the border be black or cold in tone, the gold is chilled and lowered in tone throughout. To this quality must be added that of reflecting softly, and with a subdued warmth of tone, the colouring of the room and its accessories; thus imperceptibly blending part with part. All practical decorators know that it is far easier to bring colours into harmony where gold is used than where it is absent. By reflection, it imports fragments of the colour of one part of the decoration into the midst of some other portion of the general colouring in such a way, and with such modulation and variety, as to afford the most valuable of all means for "recall" of colours. And it does this with so much "play" of light and dark that it excites the same sort of interest as that which we experience in watching the changes of colour on the sea as the clouds pass over. Reverting again to the question of proportional structure, and the colourist's dealing therewith, there are numerous cases in which the interior has either by intention, by want of means, or other circumstances, been left with its leading features too cumbrous, too bold, or simply too plain for the size or character of the whole. The excess of such features may be repressed by keeping the depth of colour more nearly that of the intermediate surfaces than would be the case if expression were the object. Thus, if we suppose a ceiling to be divided into small blue panels by very wide beams or margins, the effect will not be unpleasant if the beams are of brown wood; but should they be of some white tone, the disproportion would be at once painfully apparent. Precisely the same case often arises with the proportions of doors and their architraves, dadoes, cornices, and other features of ordinary rooms. Where a room is of full height its cornice may often advantageously partake of the colouring of the ceiling in point of strength; but, if the room be low, every means must be taken to make it a part of the wall by keeping its colouring allied to the wall rather than to the ceiling, lest the eye be stopped before it has surmounted the cornice. In this latter case, the strongest contrast must be placed as high up in the cornice as there is any convenient place for it. In some cases it is possible to continue the same strength of colour into the ceiling itself and so to avoid any sharp demarcation. The ornamentation is no less important than the colouring when dealing with proportion, and its distribution is a matter of at least as nice judgment. It is quite possible to disturb the sense of simplicity by a very small amount of ornament, as it is also possible to retain the effect of simplicity even where ornament has been freely used. When but little ornament is used it should be strictly confined to those points or lines which should be noticed. The ornament will then help to decide the impression of "scale" in relation to the whole interior. If too small, it will produce a sense of feebleness; if too large and unbroken, it will give a sense of coarseness. As a rule the less of ornament there is the more important it is that its position, form, and proportion, be carefully studied. The coarse effect of bold forms of treatment may be avoided by having a "secondary" finer ornament drawn within, or interlaced with the larger forms. The finer line must be the one to break into complications of movement and curve. It never answers to make thick and heavy lines break into lively or elaborate contortions. There is something of the dancing elephant about such ornament. Where breadth and substance of line are used, the movement must be in dignified and measured curves, or in forms capable of geometrical analysis, whilst the lighter lines perform within or around them, with a freer and less trammelled gaiety. So far we have been dealing with general principles. Let us pass to the consideration of practical treatment, especially when applied to the interiors of buildings having defined uses. In speaking of the decoration of churches, I propose to omit all mention of those of "Gothic" character, and to confine my remarks to those which, because less attractive to many of us, deserve some careful thought as to how they may be rendered more harmonious to their use, and more in sympathy with the religious side of our minds and senses. Dignity, harmony, repose, are, perhaps, the first qualities we seek in the interior devoted to religious worship, whether it be large or small. Repose can be best secured by a firm and undisturbed expression of the leading forms of the structure. The mind is thus quickly set at rest, and relieved from an "instinctive search" for structural expression. However lavish the ornament may be, it must not interfere with this first requirement. "Dignity" of colouring is, perhaps, more difficult of definition. It may be attained by light and simple tones if the building has already noble features; but these are often insufficient or imperfect, or the light is too diffused to afford any effects arousing interest. Then a bold colouring, if skilfully handled, is of great value. Rich and tolerably pure reds, warm greens and browns, blues carefully modulated, and the mellowing gold, are among the hues which first present themselves; nor must we forget those touchstones of colour, black and white, — indispensable, the one to purify, the other to intensify the colours employed. Tints of any of the purer colours,—that is to say, pure colours having a large admixture of white,— are inadmissible. Indeed, for the interior of places of worship, the lighter the hue, the less pure (or the more subdued) must be the tone. The use of pictorial art and of stained glass will each suggest some restrictions or modifications in the colouring. The employment of both together has often been deprecated; but I can call to mind many a building containing both, from which I should be sorry to exclude either. I would suggest, however, some attention to the following rules where both are used: (1) The relative positions of stained glass and picture should be such that the tinted rays of sunlight would never, or rarely, fall directly on the painting; (2) there should be a free use of white with the coloured glass; (3) the paintings should be pure in tone, and simple and expressive in drawing. The conditions which are offered to the colourist by places of amusement are of a totally different kind. Not only must the place in which we meet look cheerful, but we ourselves must look pleasant, especially that majority who have "complexions" and are "dressed." A great deal has been said and written about the colouring of theatres; but so far as colouring goes, the theorists, when they have differed from accepted practice founded on experience, have been wrong. Chevreul proves to his own satisfaction that crimson is a bad colour for the interior of the boxes, as tending to give the complexion a tinge of the complementary green. He advocates a pale green, therefore, for the interior of the boxes as enhancing the rose tints of the complexion. He thinks that the fronts of the boxes have a much more remote effect in this respect; but that the cushion should be covered in green velvet. Now, here experience tells us that he is absolutely wrong from first to last; as he is, indeed, constantly wrong when he is discussing the effects of colour on "complexion." In this very matter he appeals to results of experiments made on flat surfaces with uniform tints; and he is, therefore, in no position to judge of effects in which one colour is in deep shadow, another in strong light, the object to be influenced being a quite uncertain quantity as to depth of complexion, colour of costume, and degree of shade. Green lining to the boxes, and particularly green cushions on the front, would be fatal to four out of five complexions and costumes. There is no colour at all equal to red—and especially red in shadow—for setting off to advantage a variety of complexions and costumes. The too red complexion is toned down by contrast; the pale borrows colour by "sympathy." Besides this the shadows are all warmed by reflection, and it is cold shadows, not cool lights, which are detrimental to a face. Then Chevreul underrates the value of box-fronts as colour. A light colour which shall not be either so light or so pure as to injure, by contrast, the whites of the costumes, and which shall yet set forth the colouring of the faces, will be found best. This may be relieved by gilding, and by neutral tints, or coloured ornament sufficiently broken

up to afford only a neutral result—a soft and light contrast to the darker interior. For rooms devoted to music or dancing, the conditions of colouring are not so similar to those for theatres as might at first appear. In the theatre the lighting of the audience is direct, the background being in shadow. In the ball-room or concert-room the light is to a great extent reflected from the walls, and will partake more or less of their tone, unless the sources of light are distributed pretty equally around the walls themselves. It is desirable to distribute the sources of light, both to obviate reflected tints, and to diminish shadow. It is also very desirable to employ such tones of colour as readily reflect light, and light rather warm than cold. However, many of the tints best for this, such as rather pure pale buffs, are trying to portions of the costumes, especially to whites of transparent material, which against them become smoky in tone. A large preponderance of white (not too raw), with a liberal use of gilding, and some red (as some drapery or otherwise), for the gilding to reflect, is always good. No background is so effective for a ball-room as tapestry in pale tones of fairly pure colour, which the texture of the fabric softens below the colouring of the complexions or dresses. But in a public room so costly a decoration can rarely be expected. The beautiful variations of quiet tints exhibited by natural marbles are again admirable. If the cost allowed of it, I would desire nothing better than to have the lower walls, to a height of some 6ft. or 7ft., lined with various marbles, and the upper walls in subdued white relieved with gilding, and divided at intervals with pilasters of coloured marble. The draperies, portières, &c., should in this case be of rich and deep colours. This, again, is a costly decoration, and we should consider what is possible with moderate means. Very grey tones of green, broken up by soft white, and set off by reds in the draperies, are becoming if the lighting is well distributed. The whites in this case may either be softened by tinting, or by some form of delicate arabesque ornament in mixed colouring painted thereon. The reds of the draperies must, of course, be recalled, in somewhat reduced tone, in the decorations, either as margins, lines, or medallions, or by any means which may appear appropriate. If the proportions of the room allowed of it, a good system of decoration for a ball-room or concert-room would be one by which the colour intended as back-ground to the company would be carried only high enough to serve that purpose, and the larger surface of wall from which light would be reflected would be kept in light and somewhat warm tones. In the case of smaller rooms occasionally used for similar purposes in private houses, the great point to attend to is the even distribution of light. A wall with some depth of colour, if not too gay, may be made a very effective background. But care must be taken, in that case, to light up the company and not so much the walls. For a dinner-party a dark wall relieved with pictures is much the most effective and becoming. As to the colouring of the galleries in museums, whether for the exhibition of pictures, sculpture, or miscellaneous objects, I will only allude to a few of the main points to be considered. For pictures, which, of course, vary greatly in tone, and contain each of them a complex arrangement of graduated colour, there is no background equal to red. This must be neither too subdued nor too dark, if the pictures be hung near together; but where much space is left between the pictures a duller tone may be preferred. Marbles are excellent for the architectural features, and gilding also, if confined to structural lines. All whites must be lowered, for if too crude they diminish the light in the pictures. Bronze is very useful in the accessories. The colouring thus indicated is likewise adapted for sculpture, though some modifications may suggest themselves. Chevreul forgot to take into account the secondary light, which is that found in the shades, and thought that by painting the walls blue-grey or green the statues would assume the warm tints of the complementaries of those colours. This would be true if the white forms of the statues were flat bas-reliefs in the same plane as the walls, or rather if there were only one wall. But we are dealing with spaces surrounded by walls, and that light partaking of their colour is being reflected from all of them. And the more diffuse the light, the greater the effect of the "secondary" or reflected light which is found in the shades. The secondary light always partakes of the complementary of the direct or primary light; consequently green or bluish walls will inevitably impart a cold or green tone to the half-tints and shadows. On the other hand, where a statue is well lighted, a background of dark green foliage which is behind it only, is admirable. Or if the walls surrounding a statue be of a warm tone, a limited background of deep, warm green may be made effective. Two other items of a sculpture-gallery must be considered. The floor and the pedestals, or bases, on which the statues are placed. The floor may be white, or white and black, if the walls be of warm and full colour; but if the walls be pale, the floor may advantageously be of a dark, warm tone, such as maroon or rich brown. In the latter case the pedestals may be of some green tones, for the statues will derive some advantage in the direction of the complementary. If the walls be red, a grey marble makes the more satisfactory pedestal, or at least a marble containing much grey. In a museum of miscellaneous objects, or of natural specimens, we come to an entirely different set of conditions. Objects of this kind are, for the most part, in cases inclosed with glass, and the backs of the cases may be coloured to suit the contents of each. For such objects as china or jewelry dark colours will be preferable; for bronzes, or dark pottery, grey is suitable; whilst for such objects as specimens of natural history, stuffed birds, fossils, or objects possessing many varieties of colouring, a pale grey tint is best. I observe that this tint has been selected for cases in the New Museum of Natural History; and I am glad to take the opportunity to congratulate the architect of that fine building on the excellent taste and effect of the painted decoration of the interior, which has been treated harmoniously and with judicious reserve. On the general decoration of such galleries, above the line of the inclosed cases, I am not disposed to place hard-and-fast restrictions. Nothing could certainly be less desirable than vast expanses of white. The many varieties of natural woods afford, as it seems to me, one very agreeable and suitable field of choice. In any case, the good sense of the architect will keep him within the limits of what is fitting and appropriate.

DISCUSSION.

Mr. F. C. Penrose, M.A., said the "black colour" in the pendentives of St. Paul's Cathedral, criticised by Mr. Crace, was really a dark blue; absolutely blue-black would produce a very strong and objectionable contrast. He had been glad to hear that artist advocate reserve in the decorative treatment of public buildings. He wished to bring before the meeting some examples of a new process executed and sent by Mr. Wilkins. It had as its body a mineral composition, with linseed-oil as the medium, and was entirely free from lead, and the inconvenience that metal gave rise to in those exposed to its influence. It dried rapidly, and that without the use of chemical dryers. The work promised to be permanent, as neither sulphuretted hydrogen nor acids had any action upon it.

Mr. A. Waterhouse, A.R.A., said he had watched Mr. Ford Madox Brown's labours at Manchester with great interest, and with strong approval. He thought Mr. Brown had made a very great success in that town-hall; the only unsatisfactory feature of decorations was the sum paid for them, and he supposed the men of Manchester, when they made their arrangements for the work, had no idea of what he was about to undertake. Mr. Madox Brown had said that the water-fresco process had been given up, but very successful paintings had been obtained in this manner, having a dead surface, without any of the blurred appearances of the work in the Houses of Parliament.

M. J. Gregory Crace said that 35 or 40 years ago, when in Munich, Herr Kulbach gave him the recipe for a composition he was using for encaustic paintings in the hall of the museum — namely, 1½lb. wax to 3½lb. gum damar and 5lb. of turpentine. The gum and wax were scraped finely, and then very gently boiled together till the composition became uniform. The surface-ground was simply plaster, which was sufficiently porous for the vehicle, and heat was applied to the work to throw the colour into the ground. The result was that the colours were extremely brilliant and forcible, having the advantages of oil painting without its defects. One disadvantage of all encaustic painting was that unless the wax was well absorbed by the ground, the work was most difficult to clean. Any attempt to wash or rub the surface produced a smear, and he had therefore abandoned this process for fresco work. He feared that no paintings, in a smoky town like Manchester, would last 100 years.

Mr. McKinnon described a process of fresco he had used in South America in which a body of lime was used with pure dissolved glue as a medium, and said it was adapted to the decoration of the houses of the middle classes, and even the poor, and could be usefully introduced into England.

Mr. T. Porter had observed that in many painted ceilings the drabs, and those colours only, soon presented a smeary and unfinished appearance, and asked Mr. Crace the reason. He objected to decorated ceilings, as they usually had the effect of reducing the apparent height of a room.

Mr. Hugh Stannus differed from Mr. Madox Brown's theory that the artist, and not the architect, should have the choice of subjects for mural decorations. In Sir F. Leighton's frescoed lunette at South Kensington Museum, he noticed that the surface had been made granular and rough, whereas he understood Mr. Brown to object to any greater roughness than necessary to get a key. The last speaker had referred to the effect of colour on ceilings lowering the apparent height; this arose from the fact that our artists returned from Italy determined to reproduce the bright ceilings so charming in a clear atmosphere and intense sunlight, but overlooked the altered conditions of climate, and forgot to decorate the walls as well as ceilings of their rooms.

Mr. F. Madox Brown explained that as to the roughness of surface, he had to carefully supervise the plasterer's work, so as to get it just sufficiently rough to absorb the colours. The fault usually was that it was too finely rendered, and he had to go over it with a piece of grit stone to roughen it. If the surface was unduly rough, the interstices became filled with dust, and the picture soon looked dirty. The work of Sir F. Leighton, at South Kensington Museum, was an example of the Gambier Parry process, exactly carried out on its inventor's system. Spirits of lavender (as to which Mr. Hansard had asked a question) was used as the most powerful solvent for gums, which were not affected by spirits of wine, but what this spirit of lavender was nowadays extracted from he did not know.

The President said he had been greatly interested in Mr. Madox Brown's application of fresco decorations to public buildings. At the present time a member of the Society of Antiquaries was engaged in cataloguing the wall-paintings remaining in English churches, and had found there was an astounding number. The remarkable fact was that these paintings, which mostly dated from the 13th or 14th centuries, had been executed, not in tempera, but in distemper, which was now supposed not to be permanent. Mr. Armitage, R.A., had told him that the paintings he executed many years ago in a Roman Catholic Church by a real fresco process, had been defaced by a white film on the surface, and that he had cleaned them, and proposed to re-treat them by the Gambier-Parry process. The frescoes in a church the speaker had built, at Westminster, and those in the House of Lords, were apparently fading away. One great advantage of the Gambier-Parry process was that the work could be commenced, and might be suspended for a season, and then again taken up without showing the point of junction. In consequence of this, Sir F. Leighton, when painting in this process the Parable of the Virgins on the walls of Lyndhurst Church, was able to return to it without difficulty after a year's absence. Mr. Madox Brown had argued that the artist ought to select the subject; but he was bound to say that those who ordered the work had a right to suggest this, although the treatment must be left in the painter's hands. To attempt to get a rough surface to the work, for its own sake, would be a grave mistake. Glass and marble mosaics could be only used effectively on curved surfaces, and he now regretted the effect of some of the work he had executed in the Guards' Chapel, Birdcage-walk. Mr.

Crace appeared to advocate the Italian method of emphasising the constructional lines by colour, but in his judgment many of the churches of Italy were completely ruined in appearance by the broad bands of colour with which the vaulting ribs and other features were exaggerated. The President concluded by putting the vote of thanks to the readers of papers, which had been proposed by Messrs. Wm. White and Waterhouse.

Mr. Crace, in acknowledging it, said that the unfinished appearance of drab colours was really due to their dirty tones, which made those colours the first to seem cheerless and dead. He thought bright colour never lowered the apparent height of a room except where the decoration was not properly supported by the treatment of wall surfaces. He had referred in his paper at some length to Chevreul, because although he had drawn some useful rules, he was quite unacquainted with the modern spectrum discoveries as to the relations of colours to each other and to light, and consequently made some curious errors.

The Conference was then formally closed by the passing of votes of thanks—to the Conference committee and sub-committee who arranged the meetings and visits, proposed by Messrs. J. M'V. Anderson and W. H. White; and to the Council of the Institute proposed by Messrs. Morham of Edinburgh, and Mitchell of Oldham.

ARCHITECTURAL ASSOCIATION.

THE fortnightly meeting of the Association was held on Friday evening, the President, Mr. E. C. Lee in the chair. The following new members were elected: Messrs. A. M. Hoblyn Oliver, A. H. Acton, A. M. Calderon, E. S. Gale, A. Pictor, Reginald White, E. A. Calton, D. Waterhouse, and H. G. Papps; and 14 nominations were read. A vote of thanks was passed to Mr. W. H. Lascelles, for permitting the members to inspect his works in Bunhill-row, on the motion of Mr. Eales, who stated that the next visit would take place on Saturday, the 21st inst. (to-morrow), at 3 p.m., when the new Fruit and Vegetable Market, Smithfield, would be seen, by permission of Mr. Horace Jones. Professor Kerr presented to the library several volumes he had written, an act acknowledged by a cordial vote of thanks.

THE LATE MR. WILLIAM BURGES, A.R.A.

The President then read the following obituary notes on the late Mr. Burges:—

This evening, and in this place, but for his untimely decease, William Burges, the newly-elected A.R.A., would have given all an intellectual treat in his paper on "Queen Anne Architecture." William Burges, though never a member of this Association, has endeared himself to so many of its members (for he was always a friend to young men), was ever so ready to assist us, that I feel that no apology is needed for this departure from the usual custom, even though there were not, as in the present instance, a special reason for it. It is not my desire, nor on this occasion do I feel equal to the task, to give a descriptive report of his life and work. These have been happily touched on in the various journals, and will, I believe, on a future occasion be brought before you in a complete form. We must all feel that a man great in the art of architecture in its broadest sense has gone from our midst. To those who remember the effect of his Law Court drawings on the architecture of the period, the feeling comes more home; for of late, on account of his works being executed far from London, students in the Metropolis have possibly conceived an idea of William Burges rather as a designer of decoration than a great architect. These do not know the *furore* caused in the architectural world by his Law Courts design, the revulsion against false principles that the Drysalters' warehouse in Thames-street effected; they may not have heard of the Bombay Schools of Art, perhaps the most marvellous design that he ever made, compelling rigid 13th-century Gothic to fulfil the requirements of the Torrid Zone, and to harmonise with its surroundings; nor may they know the wondrous flexibility of the ultra-Goth shown in his beautiful decoration (in the Early Renaissance style) of the chapel of Worcester College, Oxford. Art in everything was his leading principle through life; and though he loved more fondly than any other the works in architecture of the 13th century, which he termed the Classic period of Mediæval art, he conscientiously studied all styles, and could manipulate them in a manner simply marvellous even to those who knew him best. He hated a sham; he laboriously studied all materials and their treatment, sought out the actual methods, and strove to reproduce them in his works. There is, I presume, not a material used in the building or decorative arts in which he has not erected a monument to his genius. Something may be gleaned of my meaning from the photographs exhibited on the screen. Probably no architect of the present day was more capable of erecting a really grand building. His power of grasp in the large, his grandeur of conception and completion of design in its minutest details, was, I think, unequalled. His love of completeness in the carrying out of his design is exemplified in all his works—notably Cardiff Castle; Cork Cathedral, a now completed building in all its parts, and a monument worthy of the man. I need scarcely point to his last work—left unfinished—his own house at Melbury-road, Holland Park, to which he most kindly admitted the Colour Decoration Class during his late and, though at that time unexpected, final illness. A word as to his literary labours, which are known to so many. Few writers on archæology are so trustworthy as William Burges, for he stated nothing but what he knew, and knew thoroughly. He arrived at a knowledge of his facts by patient personal observation of the work he described, and by reference to original sources of information, taking nothing for granted that could be ascertained by research; his judgment in matters of the history of art and archæology being in all cases based on testimony rigorously sifted according to the strict laws of evidence. What effect his works and teachings have had on the present generation it is perhaps too soon to decide; but of this there is little doubt, that he liberated Gothic design from dry-as-dust precedent and studied copyism, and, though a reverent follower of all rational precedent, he incalculated the reproduction of the feeling of old work rather than the slavish imitation of it. One of his leading principles was that the architect should store his mind by laborious and conscientious measurements and study of the ways and means of the old men, and then go home and design from, and not to, them. That he should allow fancy, properly under control, to have something to say in the matter, and, working on fixed principles of construction and design, to produce some new thing. As an illustration I may mention that his thirteenth-century dormer to the Law Courts was based on the Flamboyant dormers of the Cluny Museum; and this translation, as I may call it, of the architectual ideas of good artists of all periods into the language of the style in which he himself thought, was a system which he often adopted, though it would, perhaps, be going too far to say it was the keystone of his method of design. Equally great in any style he took in hand, and equally finished in detail, advancing, though more slowly than others, in the requirements and desires of the age, we are, perhaps, robbed of another surprise in a new method of designing from one of the most original of modern architects, which might possibly be called Burgesian Queen Anne. We cannot tell how he would have met the subject of his paper, but we may be sure that his treatment of the subject would have been thoughtful as well as vigorous; that he would have dealt out censure with unsparing hand on thoughtless detail, unconstructional and meretricious design, but would not have been unmindful of the real values of this latest development. Ever a kindly and genial friend, his loss will long be felt by all who had the pleasure of knowing him. Too tardily recognised by the Royal Academy and elected a member—vigorous and honest in criticism, jealous of the honour of his profession, of great artistic attainment, outspoken and straightforward, William Burges leaves a gap that it will not be easy to fill.

ANCIENT LIGHTS.

Mr. Robert E. Powell read a paper on this subject. He said: A man having possession of a piece of land has the control thereof from as deep as he can go in the earth to as high as he can go towards the sky, so long as he does no injury to his fellows. Therefore, the owner of each individual plot should in building obtain all the light or air he requires for the purposes of his building from the space above his own land, and from that only, with this important addition,—that he, in common with others, also has the right over the portion which he or others in his behalf have devoted to public or semi-public purposes for the sake of common convenience in access to the several properties. This one point being established, it is evident that if in building he so places his erection on his plot that he leaves not space enough for all the light and air he requires for his purposes, to be obtained from his own land or across the highway, he is taking, and intentionally taking, more than he is entitled to, for in building within his strict rights he should build only in the way he would do if his land were surrounded entirely by an impenetrable division, such as a wall reaching from the centre of the earth to the sky. If, however, from carelessness or from malice prepense he so places his windows that for due efficiency they must receive light over his neighbour's land, he is of necessity bound to take the consequences. The neighbour has no power to compel him to close them, neither has he any title to invade his property by entering upon his land to himself close them. His only remedy, therefore, is so to use his own land, that he may not be deemed to have consented to the user of his own ground which his neighbour intended. In the majority of cases, the most convenient form of user for this purpose is the erection of some sort of hoard which shall be coincident with the boundary of his own land, and be of sufficient height to effectually prevent his neighbour from obtaining light other than from his own property. Occasionally a covenant for the user of light over a neighbour's property is asked for and granted; more especially when there is no immediate prospect of the adjacent land coming soon into occupation. There is, however, always an element of danger in granting any such consent, even upon payment of an annual rent, as there may be difficulty in withdrawing the grant in the event of your requiring to use the land so long as the tenant pays the stipulated rent, which, if it answers his purpose, he will be sure to do. If not implied by grant it is evident then in the abstract that the light is filched from the neighbour, just as much as a pickpocket filches whatever he may acquire in that way. You may say that by the exercise of ordinary vigilance, and the exercise of his own rights, the servient owner (or one over whose ground the easement is sought to be acquired by the dominant owner), may prevent the acquisition of any such privilege. True, so may any person prevent his pocket being picked; but supposing the action to be accomplished, the law makes this extraordinary distinction,—if the pickpocket is caught in the act, he is punished for the attempt. The dominant owner caught in the act goes free, and, if the servient owner does not incur considerable expense to prevent him, ultimately is allowed to keep that which he filched in the first instance. The pickpocket, on the contrary, if he succeeds in acquiring complete possession of the article he filches, and is caught, commits a greater crime than the mere attempt, and is far more severely punished accordingly, while the dominant owner, if he succeeds in acquiring complete possession, is allowed to retain it as a reward for his acuteness. The whole system of "ancient lights," in addition to its other inconveniences, holds out a direct premium for dishonesty. It is like enacting that, if you go to sleep, and a thief puts his hand into your pocket, if you do not wake for twenty minutes after, he is legally entitled to keep all he has succeeded in abstracting. Clause 3 of the Prescription Act, 2 and 3 Will. IV, would appear to be clear enough to meet all possible cases requiring only the proof of the twenty years to insure the right to the light. Judge-made law, however, has made considerable variations in this. A leading decision goes to the root of the whole matter by inserting a qualification in the Act, which, to a non-legal mind, seems unwarrantable, and is the cause of the greater number of the cases that arise, although, no doubt, it greatly mitigates the hardship every case involves. The qualification is, that to sustain the right, the premises must be proved to suffer "substantial damage" (Martin *v.* Headon, 4th May, 1866, *re* Conduit-place, Paddington, V. C. Kindersley; Curriers' Company *v.* Corbett, L. J. Turner; Clarke *v.* Clarke, Nov., 1865). In Yates *v.* Jack,

however (1866), the original law would seem to have been maintained; while in Jackson *v.* Duke of Newcastle, as to premises in Cockspur-street, it was, on appeal, decided that the owner of the dominant tenement must be content to receive money compensation for injury not of very great extent. And in Rand *v.* Cook, Chief Baron Pollock said:—"It is not the law that a man who has enjoyed a certain amount of light should go on enjoying that amount for ever. Society is so constituted that there must be give and take always going on. Some people, no doubt, wished to make it all take and no give," which latter remark surely will bear interpretation different to that he evidently intended. He who takes without asking at first, and objects when his neighbour wants his own, surely is a case of all take and no give. The opening remarks of the judge are diametrically opposed to the wording of the Prescription Act under which the action was brought, and which says, in effect, that "where the light has been enjoyed twenty years, the right shall be deemed absolute and indefeasible." Another extension of the same principle is, that when a building is in a shell erection before an action is brought, the Court will not order it to be pulled down unless in a very extreme case, but will order an inquiry to assess a sum for damage to be payable by the owner of the servient to that of the dominant tenement (Isenberg *v.* East India House Estate Company, Dec. 19, 1863). It is held, too, in Lawrence *v.* Austin, 1865, by the Master of the Rolls, that if a building is completed before a bill is filed, the Court of Chancery will not interfere, but will leave the plaintiff to his remedy in an action for damages. The law of light principally affects members of our profession in connection with identity or otherwise of existing lights or buildings with some that have gone before, and in connection with the sufficiency of any given light for the present or past purpose for which it is used; and finally, with the effect that any proposed erection will have in the matter of light with certain other existing premises. Previously to a small treatise published by Professor Kerr, there seems to have been no sort of system with the least pretension to accuracy. And any evidence given upon the subject was merely the dogmatic expression of an opinion—an opinion which the application of such a system as he then introduced would in many cases have proved to be in a great degree erroneous. Professor Kerr starts by the proposition that light is received equally from every point in the whole hemisphere of the heavens. A skylight in an unrestricted position receives light from the whole hemisphere, the vertical section of which is a hemisphere in all directions through the centre of the plan, which is a circle. A window in a vertical surface will receive light from half a hemisphere, which will be a semicircle in plan and a quadrant in elevation. You may perhaps say, Why a quadrant in elevation? For this reason, that no matter how high the base of our window may be, that for all purposes represents the horizon; and any light received from below that line is not direct light, but more or less of the nature of reflected light. As the thickness of wall and nature of the opening exert great influence on the quantity of light admitted to the apartment, the advantage of splayed jambs is shown as admitting direct light nearer to the darker corners of the room. Mr. Kerr divides the half hemisphere into what may be termed spherical squares by meridian and parallels, similar to the ordinary degrees of latitude and longitude on geographical globes. To each of these squares he assigns a numerical value dependent on its position. If for any particular purpose the light is more valuable for any particular quarter (say, from north or north-east for a studio), the slight correction can be made. His next step is to ascertain the proportion of this total number of measures which is on an average required for the sufficient lighting of a room as a standard. The angle of 45° is a rough approximation at the obscuration that in a town one should consider himself bound to suffer. It has no other value. Its status is perhaps justified by the Metropolitan Local Management Act, 1862, which states that no building except church or chapel should be erected of a height greater than the width of the street without the sanction of the Board of Works. There was also in 1856 a bye-law stating that streets should be 40ft. wide, and the houses not to exceed 40ft. high to eaves; if higher, street must be of width equal to height. At the back of houses the Building Act is satisfied by 100ft. super. anyhow and anywhere. The model bye-laws of the Local Government Board go a little further. Nothing has been taken in account here for the effect of reflected light, though in most cases it plays a very important part in the lighting of our rooms,—more especially is this the case when a near obstruction excludes all, or nearly all, the direct rays from sky surface. The great reason for this apparent neglect is that so much depends upon the colour and maintenance of the reflecting surface, and if that is in occupation by the servient owner, there is no continuous obligation upon him to keep it as it is; and if in occupation by the dominant owner, it is an additional burden upon his damage to further restrict his use of his own this his neighbour may benefit. In dealing with existing buildings where right of light can by any possibility come into question, the most politic course is to make complete and accurately measured and figured drawings of the whole premises; this irrespective of whether you are engaged on behalf of either the servient or the dominant tenement. The next step is to get these examined and attested as correct by some other professional man (in London, say, the district surveyor), who has no interest in the matter. You are then enabled to rely upon these as showing position of matters before anything was disturbed. Above all, fully explain to the client the difficulties and possibilities of the situation; face them at first, and you will avoid the mortification of an incomplete building standing mutilated and truncated as a melancholy exhibition of the power of "ancient lights." When buildings having ancient lights, or obscuring windows, are pulled down, unless the re-erection is to be immediate, it is often policy to form a skeleton scaffold showing roughly the position and size of the old. Abandonment for a time will not lose the right, but it must clearly be shown that the non-use was not by reason of any action on the part of the servient owner (Tapling *v.* Jones). Lawyers will not listen to mathematical calculations, scarcely will they look at diagrams. "Give us," they say, "something a court and, if necessary, a jury, can readily follow and understand; that is all we want. Tell us you know, and what you know, and if you can readily show how you get the knowledge, so much the better. Make as many drawings and calculation as you please for your own guidance and information, but do not bring them into court. Give us results." The effect of an obstruction to old lights has in later years been obtained by raising a tarpaulin of the shape of proposed works to the place they will occupy, and then dropping it without the knowledge of the observer, who, with his back to the window, notes the result in the room supposed to be affected. You can now judge for yourselves in some small measure the pitfalls with which our law as to light abounds. But why should it? I can scarcely conceive how, in its present place, it can do anything else, based as it now is upon wilful wrong, in the first instance, and giving that wrong the benefit of legal support. Where would be the difficulty or the wrong in making it necessary that each man in building should depend for light on his own land alone, unless he would obtain a grant from his neighbours? There would be a little trouble attending the change in the first instance, perhaps a little injustice—there always is when any reform is introduced. The first step would be the repeal of the clauses in the Prescription Act. The next would be an enactment for the protection of those who, at the present time of the new enactment, had been in possession of their lights for the present statutory period of twenty years. And to secure equal justice, this should also extend to those who had been in possession for over nineteen years, inasmuch as it is impossible for the servient owner now to interrupt it for a whole year (as is required by clause 4) before the statutory period of twenty years shall have expired. By defeating the acquirement of the right in all cases which have not existed for these nineteen years, no wrong will be done, as no right has been acquired, and it is quite competent for the servient owner at the present time to prevent it. Some little time should be given after the passing of the Act before it should come into operation, as was done in the case of the Property Limitation Act, 1874, so that parties may have time to appreciate their position. To diminish future litigation, the Act might contain provisions for the granting of an indefeasible title by deed in all cases that were proved to the satisfaction of some presiding authority to have been in existence for the twenty years before the passing of the Act. I am aware of many objections to this proposal; but I think the balance of good will be found to be in favour of the change. The arguments Mr. Roger Smith used in his paper before the Royal Institute of British Architects would support my case equally well as his. There is, however, this difference in our propositions. He says, in effect:—"Let every man build as he pleases, notwithstanding he interferes with ancient lights, provided he gives due notice and pays compensation." I say, "Settle now, once for all, the position of the parties, and then let each do as he likes on his own." In no way do I propose to interfere with any man's existing rights. I cannot agree with all the arguments Mr. Smith uses to support his case. He first recites that restrictions of lighting are injurious to architecture. This I cannot concur in, for architecture should be suited to the place, not the place subordinate to the architecture, and many of our most picturesque and architectural edifices owe a great proportion of their beauty to the manner in which the architect has to overcome the difficulties of the situation. The case where premises are built upon land originally in the possession of one owner, and afterwards divided with lights in every direction, can, I conceive, readily be met by a particular and absolute grant in the transfer. At the present time, such a case almost invariably leads to litigation (Wheeldon v. Burrows), and often ends in a man not being able to keep absolutely what he paid for. In cases where a large number of houses were built upon land, originally the property of one owner, it is easy to presume that he intended each should have the lights over the neighbour as he planned them. In the case of transfer, then, it was as easy to transfer the lights he gave as it was to transfer the property, and the deed conveying the grant was as little likely to be lost as that conveying the property; in fact both could be in one. The present law causes particular hardships in the case of the numerous freehold land societies. Several of these laid out and sold their estates some twenty or thirty years ago. Some of the purchasers built on their plots almost as they pleased, but certainly not in the way intended by the society in the first instance. Other purchasers have made no use of their plots to this day, and now they find in some cases that they can make little or no profitable use of them by reason of lights which have been acquired by those astute individuals who built in the beginning. It is useless telling such people that they could have prevented the acquisition by a hoarding; they thought a man's own was his own, and not his neighbour's.

Professor Kerr said the law of ancient lights was peculiar to this country, the paradise of vested interests, and would be tolerated by no other nation. The form litigation took in preventing the obscuration of ancient lights was very unfortunate. The person who thought himself aggrieved had two remedies: to proceed at common law, or in Chancery. If he elected to take the former course, he must wait till the injury was consummated and then seek to recover damages, but he was almost certain to adopt the latter mode of proceeding in Chancery and apply for an injunction, so as to stop his neighbour from building till it should be shown that no injury would accrue to his old lights. In that case the man who wished to build had had a safeguard recently provided which was not sufficiently known to this profession. The court still granted the interim injunction, but with a proviso that the plaintiff indemnify his neighbour, should his case not be proved for the damage caused by stoppage of building operations. If the complaining neighbour will not give the indemnity, the Court will not grant an injunction, and the case will be heard on its merits in ordinary turn. Professor Kerr referred to the costs of these suits as prodigious and outrageous, adding that this was not the chief evil of litigation, which was, that the law, as laid down by judges, was continually changing, each freshly-appointed judge, in his ignorance of building and the exact state of the law, and his abhorrence of mathematical science,

developing, by his own common-sense and legal training, fresh rules applicable to the cases brought before him, and these resulted in new and bewildering precedents being established. Judges and counsel refused alike to examine diagrams or plans, although they were partial to models, which they fancied they understood, and which could be made most delusive if one knew how to get them up; they called for "direct evidence," and it was most discreditable to the architectural profession that numbers of surveyors would persuade themselves to give evidence to suit the views of the side that called them. The remedies for the present unsatisfactory state of the practice of this law of light were, the speaker contended, first, that rules and diagrams as to the incidence and reflection of light, such as those he had proposed, should be recognised as exact evidence, and secondly, and still more important, that a building owner and his architect should adopt a studiously conciliatory manner towards all neighbours, should ask as a favour what they felt to be their legal rights, and be willing to discuss the proposed alterations in a friendly manner before they committed themselves to plans.

Mr. William White, F.S.A., remarked that ingenious as Professor Kerr's system undoubtedly was, yet his calculations differed completely from either of the tables published by Mr. Tarn, and the speaker's independent investigations had led him to adopt a system of light-obstruction at variance from either of these plans. By means of the blackboard, Mr. White demonstrated at great length and to a gradually diminishing audience, his theory, and the errors he had found in the spherical measurements of other observers.

Mr. Watson, in proposing a vote of thanks to Mr. Pownall, said the advice of the first speaker, that the architect and his client should act with moderation, was excellent. His experience showed that persons whose light was threatened at once set an extraordinary value upon it. It would be desirable that the Courts should bear in mind that every unnecessary restriction on building was contrary to the public polity and welfare.

Mr. Douglass Mathews, in seconding the motion, remarked that the law of light was in a most unsatisfactory state. An architect called in either by a building owner or an objecting neighbour, should urge his client to look at the matter in a reasonable manner, and from his neighbour's standpoint. It was true an architect often caused offence by so acting, but it was incumbent on him as a matter of duty.

Mr. Pownall, in replying, suggested that if three architects, well versed in the subject of ancient lights, Messrs. Tarn, Kerr, and White, were unable to arrive at a common understanding as to the measurement of an ideal case of obscuration, it was evident that the difficulties in equitably settling cases of actual practice, where conflicting interests were involved, were enormous, and called for some alteration of the law.

THE SCIENCE AND ART OF SANITARY PLUMBING.

THE first of a course of six lectures specially addressed to plumbers, was delivered under the auspices of the National Health Society, by Mr. S. Stevens Hellyer, at the Society of Arts, on Tuesday evening. Mr. Hellyer said his experience, as the junior member of the largest firm of the kind in the kingdom, amongst plumbers, had led him to believe that possibly, from constant association with lead, they were inclined to be heavy, difficult to draw out, and still more difficult to turn; they certainly had not much sympathy with questions of mere theory. He, therefore, proposed to propound no theory which could not be sustained in practice, and should prove a few of them by actual experiments. There was a tendency amongst members of the trade to continue in the same groove as their great grandfathers; schemes might come and schemes might go, but plumbing flowed on for ever in the old bed. Even now many plumbers continued to connect and seal up and D-trap all drains, and this not only when called into old houses, but in new dwellings that had not yet been occupied; plumbers were indeed willing to dwell in Sleepy Hollow. Sanitary reformers were rightly severe upon the trade for continuing to plod on in the old paths, although men of light and leading were showing a more excellent way. He would admit that the plumbers' charge against sanitarians was well founded, that their ideas were borrowed at second-hand; there yet was a little genuine truth in their theories which would repay investigation. But there were plumbers and plumbers; some were like cistern-heads, which could receive nothing; others like solder-pipes, their capacity was soon filled, and then no more could be poured in; but there was a third class of store cisterns, gathering much, and after allowing time for it to settle, passing it on for the benefit of others; these were supplied by a ram from a never-failing stream. It was the duty of every man to do his best to advance his trade. The British workman was no favourite with the public, and he feared the plumber was no exception to the rule. Shakespeare had struck him a very hard blow, although Bacon spoke kindly of the "goodly leads upon a three-story tower." But just as it would be unfair to judge doctors by quacks, so was it unjust to judge plumbers by tinkers. The trade was injured by a class of men who assumed to be masters of this and every other trade, and it was difficult to say who or what was a plumber. On the wall the lecturer showed an enlarged copy of an actual card received by his firm, and a sample of many such. On the left-hand side was an ancient wood-cut of a closet seen in section, fitted with D-trap, and directly connected with a cistern above, in which was a service-box, while the inscription ran:

X. Y. Z.
Builder, Plumber, Painter,
Glazier, Carpenter,
Range and Stove-Maker,
Hot-Water Engineer,
Pump Maker and Sanitary Engineer.
Water-closets fixed on the *newest* principles.
Writing, Graining, Marbling,
Fountains Erected.

What must be the age of a man who had devoted a reasonable time to the study of each of these trades? If qualified, he certainly merited the degree of Master of Arts. It might be necessary in country towns to be a "three-branch hand" to gain a living; but if he could get work in London, it was a mistake for a young man to remain in such a place after his time had expired. No trade was so important to the health of the public as that of the plumber, and yet any man was at liberty to style himself a "sanitary plumber," and there was no means of testing his knowledge or qualification. It might be said that things would right themselves, and only good men find employment; but it would not take place till much unnecessary sickness and death had occurred; or that people soon found out if any defect existed in their houses. When they discovered the evil the mischief was often done. The details of plumbing were hidden from sight; those who built houses too often expended all their means at the outset, and could ill spare money for alterations which they could not tell would be an improvement on the present state of things. The remedy for the unsatisfactory state of things he had sketched would be to inaugurate a system of examinations in plumbing, and to permit no one to work as a plumber who could not produce a licence or certificate of having passed in this examination. It was strange that while we had a great department with branch schools all over the country for teaching drawing there was no school of plumbing, and no place where journeymen plumbers could meet to acquire theoretical knowledge in their craft. He would suggest therefore that it would be well if classes and lectures for young students were started, and he would undertake to do what lay in his power to make them successful. The Plumbers' Company were now taking the question up, but he had not heard that they had done anything since their founding in 1365 to improve or benefit the trade. What had the men's own societies done? The lecturer added, amidst hisses and some applause, that he had found the best workers to be those outside and untrammelled by the trade-union societies. He appealed to the men, therefore, as neither companies, rich patrons, nor unions could do much to advance their position, to look to themselves and strain every nerve to become more intelligent and skilful workmen. Notwithstanding all the charges against plumbers, however, he thought they were more sinned against than sinning. Architects did not interest themselves in such matters, devoting far more attention to the elevation than to the hidden details of the working drawings, and so they saw old-fashioned or very vague specifications, or perhaps such a plan as one he had illustrated, where tiers of closets, lavatories, and sink waters were required to be fixed above each other to a single soil-pipe, which was continued above the roof. He did not now allude to Mr. Norman Shaw's scheme, for although he did show a succession of wastes leading into one soil-pipe, he believed Mr. Shaw did not allow the w.c.s to be fixed in this way. Building overseers, again, did not interest themselves in plumbing. A few pounds laid out on wall-papers would renovate a dingy house, whereas, after calling in the plumber to rectify evils, nothing was apparent except a pigeon-house cowl on the roof and a long bill on the library table. Another disadvantage of plumbers was that they were often employed by the builder simply for the special job, and as they were then discharged, they had little interest in making a good job of it. A third and greater drawback was that they were not well trained, being too often placed in small shops or general builder's to learn the work. Three years might be usefully spent in this way but it was a monstrous waste of a youth's time to keep him for seven or eight years in such a place. He never found men from the country equal in style of work to those in London, who, with all their faults, he believed to be the best workmen. In conclusion, Mr. Hellyer again sketched out his scheme for compulsory examination, and the issue of licenses to qualified workmen, and announced that in his next lecture to be delivered on June 1st, he should treat upon "Joints and Pipe Bending."

THE COMPLETION OF THE EDDYSTONE LIGHTHOUSE.

WITHIN another month or so—much earlier than was originally anticipated—the actual building of the new Eddystone Lighthouse, so far as the masonry is concerned, will be completed, and the work of furnishing it with the lighting apparatus will then speedily begin. The whole of the stonework of the Lighthouse is in fact not merely constructed, but in the hands of the actual builders, whose work consists in conveying the already prepared blocks to the reef, and fitting them in their places there. The contract for the provision of the stone for the construction of the Lighthouse was, it will be remembered, taken by Messrs. Hugh Shearer and Co., of 21, Great George-street, Westminster, the owners of the De Lank granite quarries, near Wadebridge, and of granite quarrying rights away to Rough Tor, over an area of something like twenty square miles. The stones have been wrought in a yard at Wadebridge, where every one of the 2,200 of which the Lighthouse is composed—they weigh in all 6,000 tons—has been brought to the precise dimensions required and fitted to a hair's breadth, the whole of the structure being built up section by section preparatory to its shipment. This work has now been brought to a close by Messrs. Shearer and Co., six months before the expiration of the time allotted in their contract, and the last stone of the outward curve of the top gallery was dropped into its place in the presence of Mr. Douglass, the engineer of the work, who heartily congratulated Mr. Shearer upon the style in which the contract had been executed. The completion of the work by the present date is a matter of great importance, as it saves very much more time in the erection than the six months gained on the contract, in consequence of the early period of the season, which will enable the fitting of the lantern, and is to be proceeded with almost at once. The lighthouses of the Great and Little Basses, Ceylon—executed at the Dalbeattie granite quarries of Messrs. Shearer, Field, and Co.—were also carried out much to the satisfaction of all concerned, as in the present instance well within the time named in the contract. The stones for the Eddystone have, of course, varied somewhat in size, but those of the base may be cited as fair examples, and they are each 6ft. 6in. deep, 2ft. thick, and 3ft. 10in. on their outer circumference.

A new Wesleyan chapel has been opened in Alan-road, Ipswich. It is built of red brick, with white brick and freestone dressings: the platform and benches are of varnished deal. Mr. A. Hubert, of Ipswich, was the architect, and Mr. Alfred Coe the builders. About 450 sittings are provided, at a cost of £1,100.

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ILLUSTRATIONS.

CHURCHES OF THE NENE VALLEY.—HEREFORD COUNTY COLLEGE.—HOMESTEAD, AKENHAM, NEAR IPSWICH.—NEW BANK AT STAMFORD.

OUR LITHOGRAPHIC ILLUSTRATIONS.

CHURCHES OF THE NENE VALLEY, NORTHAMPTONSHIRE.*

One of our double-plate illustrations to-day comprises a selection of drawings which we reproduce from the book of measured and perspective plates just published by Messrs. Johnson and Kersey, in conjunction with those arranged and notes prepared for publication by the late Mr. Edmund Sharpe, of Lancaster. The work under notice is the result of the third or Northamptonshire excursion of the Architectural Association, and the aim of the joint authors throughout has been to produce a collection of examples of similar character, side by side, drawn to the same scale, and arranged in chronological order, so as to form a really valuable text-book. The Lincoln excursion—the only other excursion conducted by Mr. Sharpe of which a book of record has been published—produced a volume which was more comprehensive, inasmuch as that work included parts and details, mouldings and foliage from all parts of the buildings visited on that occasion; but the present work, if more limited in its scope, is unquestionably more complete and more permanently valuable. It deals chiefly with the main nave arcades and walls of the churches seen, including all jointings and ornamental details, as well as sections and mouldings. Thus the four important elements of church architectural design—viz., the pier-arch, the pier, and its capital and base, are presented in a most practical way, affording every facility to the student for comparative analysis and study. This series, which forms the main body and object of the work, occupies sixty plates, and our reduced copy of the drawing to-day, from All Saints, Stamford, may be taken as a very fair representative of the rest. A more charming example could not very well be selected than the south side of the chancel of this beautiful and well-known church, which in itself presents the entire history of the carving of the conventional foliage of the Lancet or Early English period comprised in the caps of the nave and chancel. The central cap and eastern respond shown in our drawing are perhaps 20 years later in date than the western respond of the same arcade, in fact, dating at the very close of the Early English period. The freedom of treatment shown in the central cap makes it very admirable, and it resembles the very similar foliage of the Presbytery of Lincoln Cathedral (A.D. 1256). The Stamford caps here described have the date 1240 given them by Mr. Sharpe. The second part of the volume before us is devoted to the representation of the most remarkable doorways of the churches visited, as well as of their piscinæ and sedilia, and these drawings occupy 35 plates. From this department of the illustrations we have chosen the admirable west porch at Higham Ferrers which, as will be remembered, occurs under the fine west tower and spire of that well-known church. The double doorways, the enriched tympanum, the niche, and the carving all help to make this example well worthy of the highest possible praise. The third division of Messrs. Johnson and Kersey's volume is devoted to perspective views of the most noteworthy of the churches visited, and these bring up the number of plates to 112 all told. One advantage throughout the book is the good practical scale of the drawings; thus, in the first part, the useful scale of 4ft. to the inch is used. The details are to this scale, and the mouldings are drawn to 1-6th of their real size. In the second part, ½in. scale is employed, with mouldings ¼ full size. The authors have symagraphed all the mouldings, as well as measured them out to full size, from which they have been reduced to their present respective scales by means of the pantagraph. The leading dimensions in all cases are written on the plates. Every drawing has been proved on the spot by the authors, and all jointings have been verified. Taken as a whole, the book has been thoroughly well done, though we think a few small ground-plans would have been of the greatest value, and their absence is much to be regretted. The persistent way in which every drawing has been backlined is certainly a mistake, and some of the general drawings have their scale spoiled somewhat in effect by the large details, which, occasionally, seem rather to crowd the plates. Thus, sheet 56, giving an elevation of the straining arch across the nave at Rushden, an almost unique example of its kind, is an instance of what we mean. The sketch of the cap apparently quite crushes the general drawing. All the sheets have been lithographed by the authors, and well printed by Mr. Kell. The book is nicely bound, and will be valued for its thoroughness and reliability by all lovers of our national Gothic Architecture. Mr. Batsford is the publisher.

HEREFORD COUNTY COLLEGE.

The Hereford County College has been built within half a mile of the city by a company of which the Dean of Hereford is the chairman, the object being to meet the modern requirements of a good sound education at a moderate cost, the inclusive cost for boarders being £36, and for day-boys £10 per annum. The buildings, which have already been erected, comprise schoolroom 50ft. by 24ft., six class-rooms, each 18ft. by 20ft., dining-hall 45ft. by 20ft., two large staircases, wide corridor, lavatories, boot-cleaning room, cloak-room, and drying-room for clothes, all of which are on the ground-floor. On the first floor there are three dormitories for boys, bath-room, matron's work-room, master's-room, housemaid's-closet, and w.c. On the second floor there are four large dormitories for boys, a sick-room, linen-room, bath-room, housemaid's-closet, w.c., and two master's-rooms. The head-master's house is attached to the school, and gives the following accommodation:—dining-room, drawing-room, study-hall, cloak-room, w.c., two staircases, butler's pantry, butler's-bedroom, master's-room, servants' hall, pantry, larder, vegetable-room, wood and coal stores, eleven bed-rooms, spacious cellarage, and a lift which communicates with each floor from the cellar to the top of the house, where there is a large loft in the roof for storage of boxes, &c. The kitchen and scullery are placed between the house and the school, and are used in common for the head master as well as for school purposes. A temporary chapel has been erected, and this, when the permanent chapel is built, will be converted into a library and reading-room, a workshop, or class-rooms, as may be most needed at the time. A stable for the accommodation of day-boys' ponies is now being built, and other additions are contemplated. Mr. Kempson, of Hereford, is the architect, and Mr. James Bowers, of the same city, the contractor. The material which has been used is local brick, with blue brick-bands and Bath stone dressings; the roofs are covered with Broseley tiles, and the joiners' work throughout is pitch pine and oak. The building, so far as it has been carried out, has cost about £14,000. The whole of the school-buildings, including the dormitories, are heated by hot water, and the school and class-rooms have, in addition, fireplaces for occasional use; the water supply is obtained by means of a steam-pump.

HOMESTEAD, AKENHAM, NEAR IPSWICH.

The buildings shown upon the bird's-eye view are being erected for Mr. James Clarke, at Akenham Hall Farm, upon a new site, to supersede some scattered farm-buildings which by age have become dilapidated. The farm comprises about 335 acres. The homestead has been designed to meet the requirements of the tenant, Mr. Ebenezer E. Gooding, who has taken an active part in the arrangement of the buildings and matters of detail connected with them. The cow-house is being fitted with Musgrave's stalls for 28 cows. The stabling accommodation is for 16 horses, 2 colts, and a pony. Water will be laid on to each stall, and to all the troughs in yards. A good supply is obtained from a well. All the yards are covered, with the exception of the yard adjoining the pig-stye. The granary, consisting of three floors, is provided with a lift. The cost of the buildings, exclusive of the roadway surrounding them, will be about £3,900. The architect is Mr. Alfred Conder, A.R.I.B.A., of Palace Chambers, 9, Bridge-street, Westminster. Mr. Robert Girling, of Ipswich, is the builder, and Mr. Robert T. Orr is clerk of the works.

NEW BANK, STAMFORD, FOR THE NORTHAMPTONSHIRE BANKING COMPANY.

These premises, facing the High-street, were completed at the end of last year. The front is built of Portland stone on the ground-floor, with Bath above. Owing to the narrowness of the street, it was not thought desirable to carry out the high-pitch roof as shown in the illustration, a flatter one being substituted. The accommodation includes a large banking-room with high panelled wainscoting, desks, counter, mantel, &c., in walnut, mahogany, and oak, from the architect's special designs, in front, and manager's and strong-rooms in direct communication, and a residence for the manager, with dining-room, kitchen, and other necessary offices on the ground-floor; drawing-room in the front on the first floor, and several bed-rooms, bath-rooms, &c., on this and the second floors. The whole of the works were well executed by Messrs. Roberts Bros., of Stamford, Mr. W. Talbot Brown, of Wellingborough, being the architect.

COMPETITIONS.

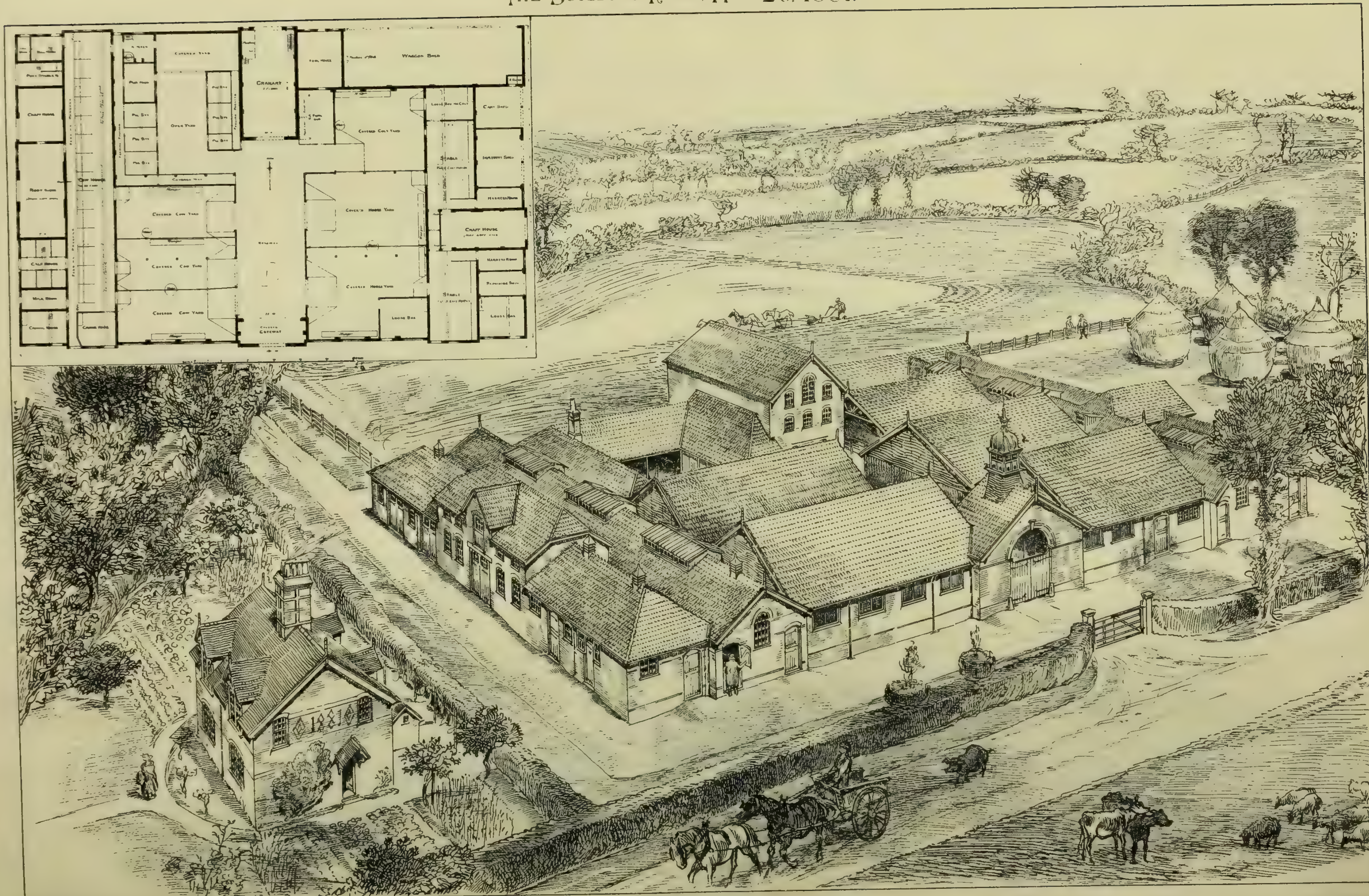
Christmas-Card Competition.—An exhibition of designs and pictures suitable for Christmas and New Year cards, is to be held at the gallery of the Society of British Artists, Suffolk-street, Pall Mall East, London, in August next. Messrs. Hildesheimer and Faulkner, publishers, of 41, Jewin-street, London, E.C., will give the sum of £3,500 in prizes, and expect by their own additional purchases to increase this amount to at least £5,000. The judges are: Mr. W. P. Frith, R.A., Mr. J. E. Millais, R.A., and Mr. Marcus Stone, A.R.A. All designs and pictures intended for this competition must be sent to the gallery of the Society of British Artists, Suffolk-street, Pall Mall East, on Tuesday, the 26th July, 1881. Particulars of the prizes and conditions of competition may be had at the address given above.

Lower Norwood, S.E.—Fourteen sets of plans and designs have boen sent in by architects in competition for the proposed new Baptist Chapel in the Gipsy-road, Norwood, and were last week exhibited at a bazaar, held at Hamilton-road Chapel, Lower Norwood.

Whitehaven.—For the proposed public swimming baths to be erected at Whitehaven, five sets of designs have been received, and have been laid before Mr. Pickering, the referee.

A select committee of the House of Commons on Tuesday passed the preamble of the Metropolitan Bridges Bill, by which powers are granted to the Metropolitan Board of Works to enable them to construct new bridges at Battersea and Putney, to partially rebuild the bridge across Deptford Creek, and to enlarge the centre arch of Vauxhall-bridge by taking out the two centre piers and placing a suspended girder across the interval. The new bridge at Putney will be a stone structure, erected at a total cost of £406,000. The Battersea-bridge is estimated at £231,000. The estimated cost of altering Vauxhall-bridge is £62,000, and the improvement of Deptford Creek £12,000.

* Churches of the Nene Valley. By Edmund Sharpe, M.A., and J. Johnson and A. H. Kersey, architects. Batsford: 52, Holborn, W.C.



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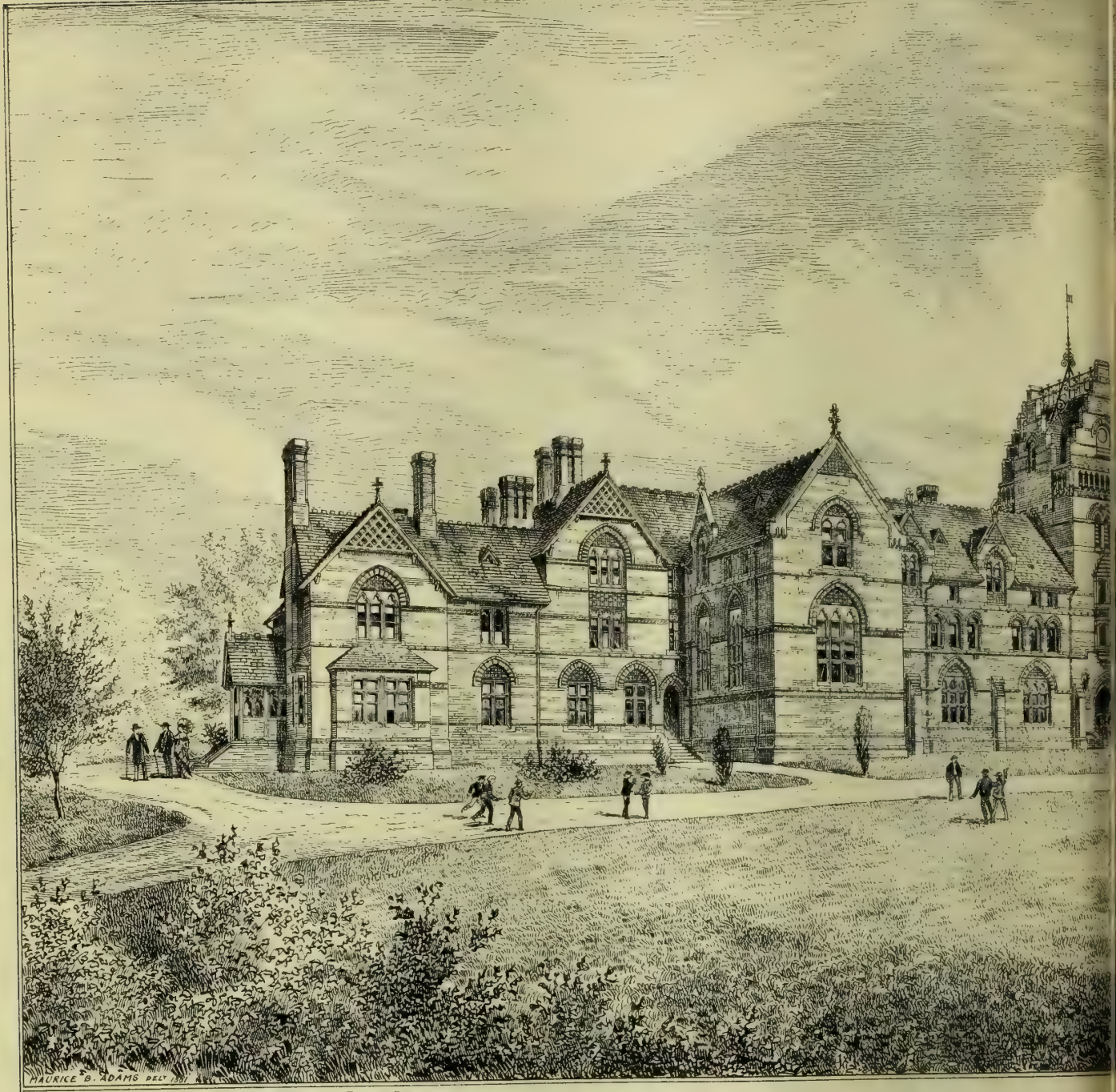

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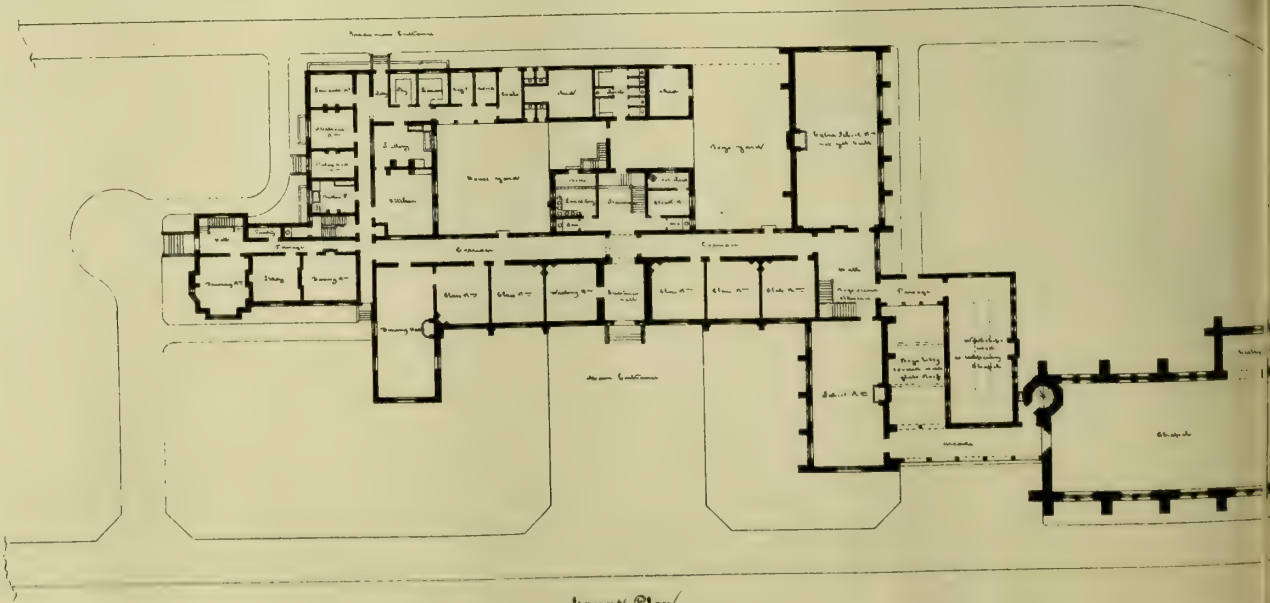
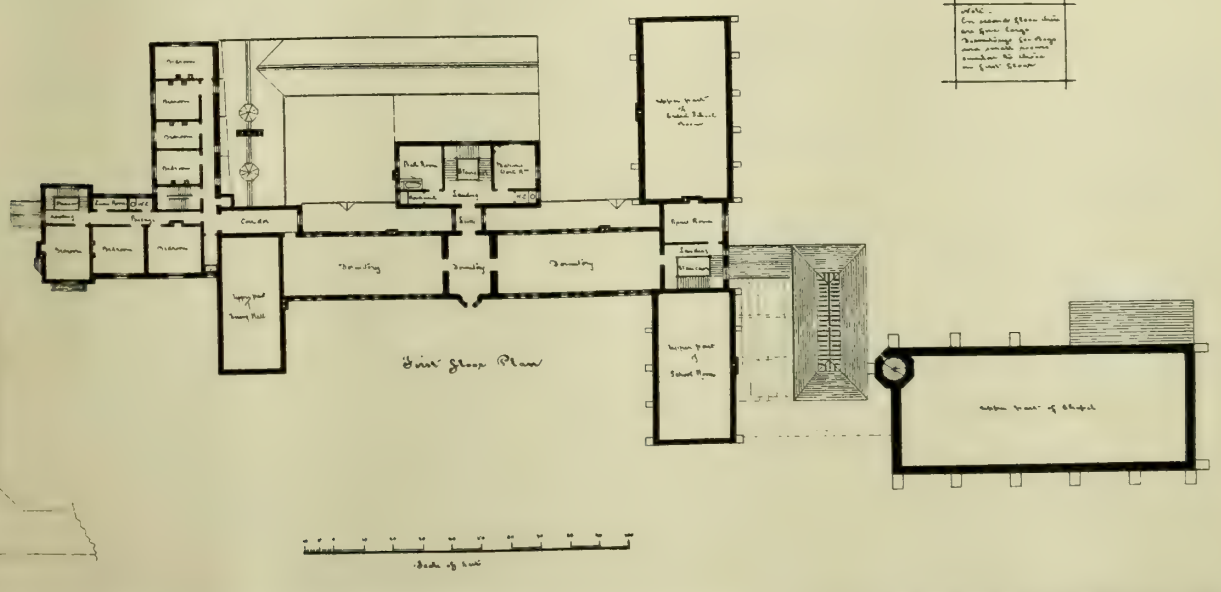


Ground Plan

FRED.K R. KEMPSON F.R.I.B.A. ARCHITECT.



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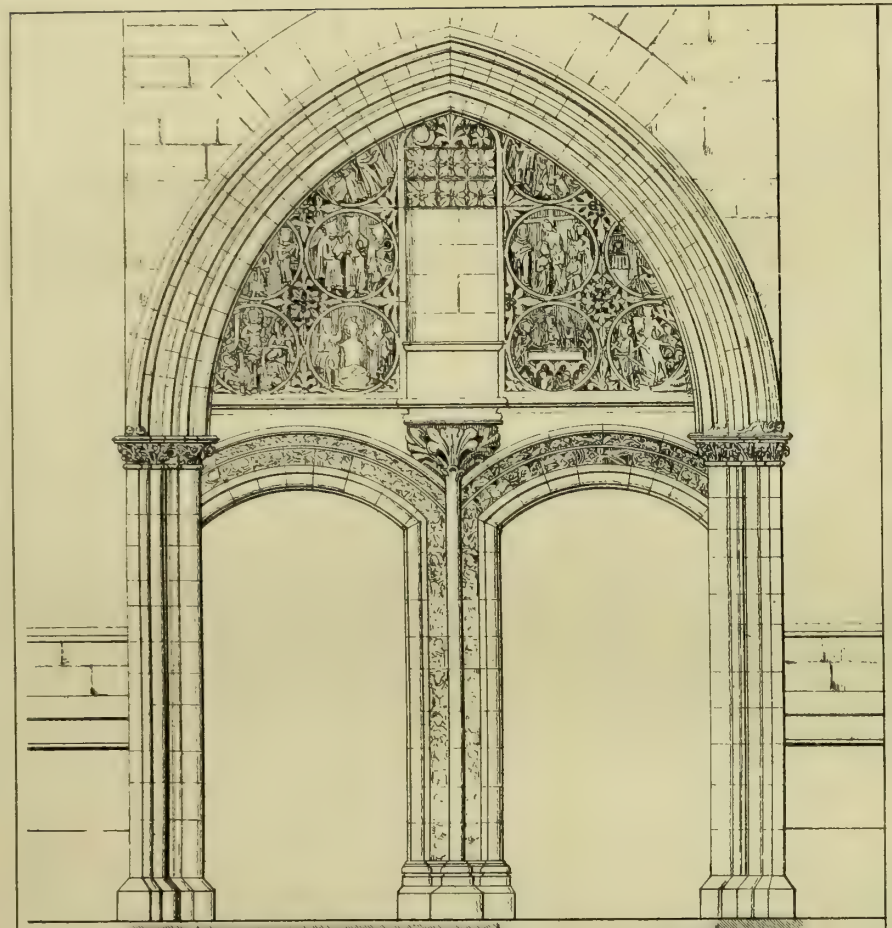
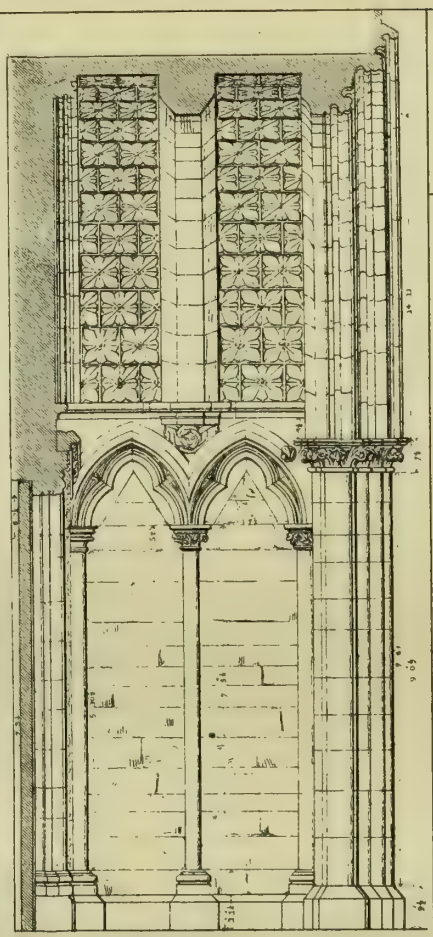
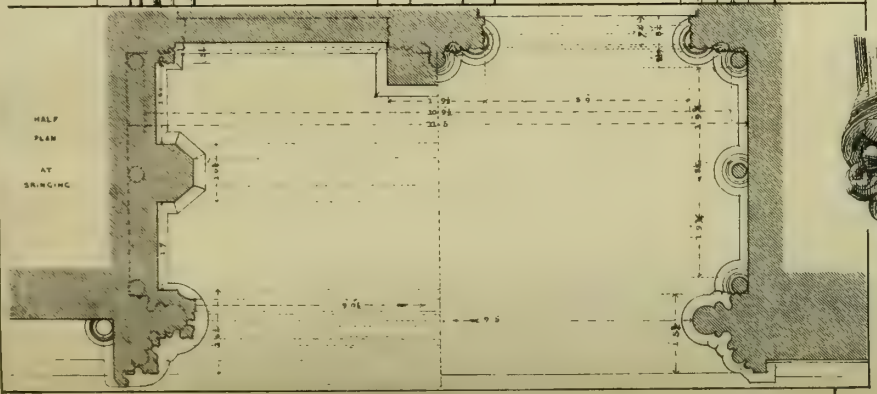
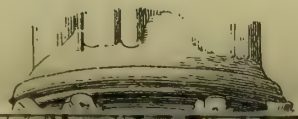
BY THE LATE EDMUND SHARPE M.A., F.R.I.B.A.
AND Mefsrs JOHNSON AND KERSEY ARCHITECTS

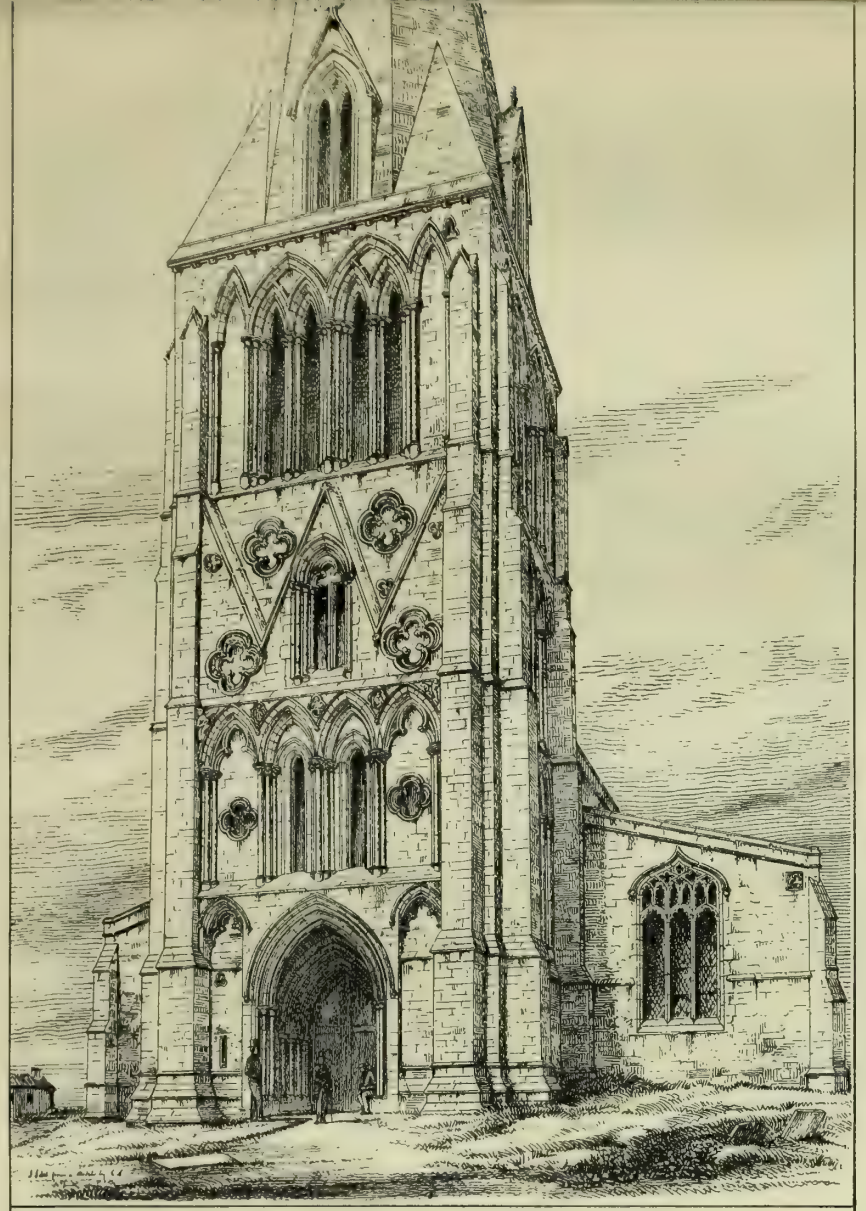




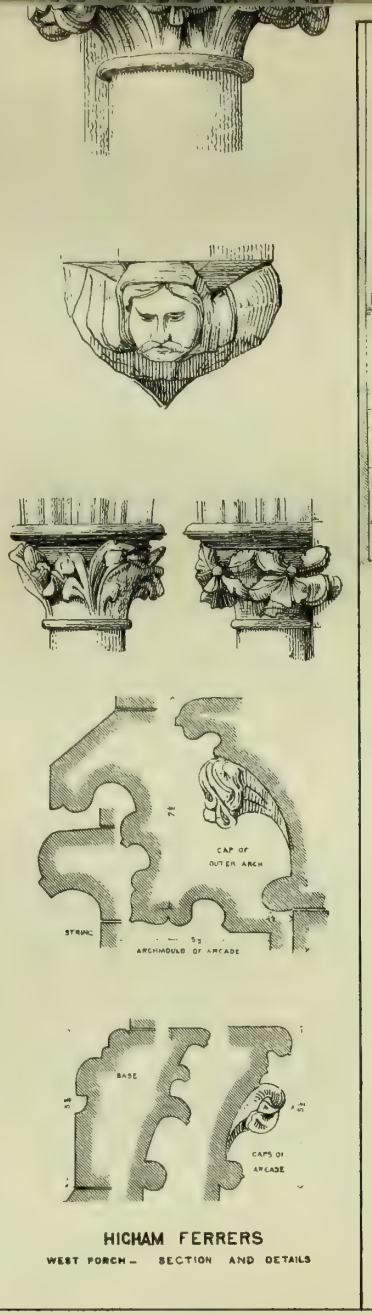




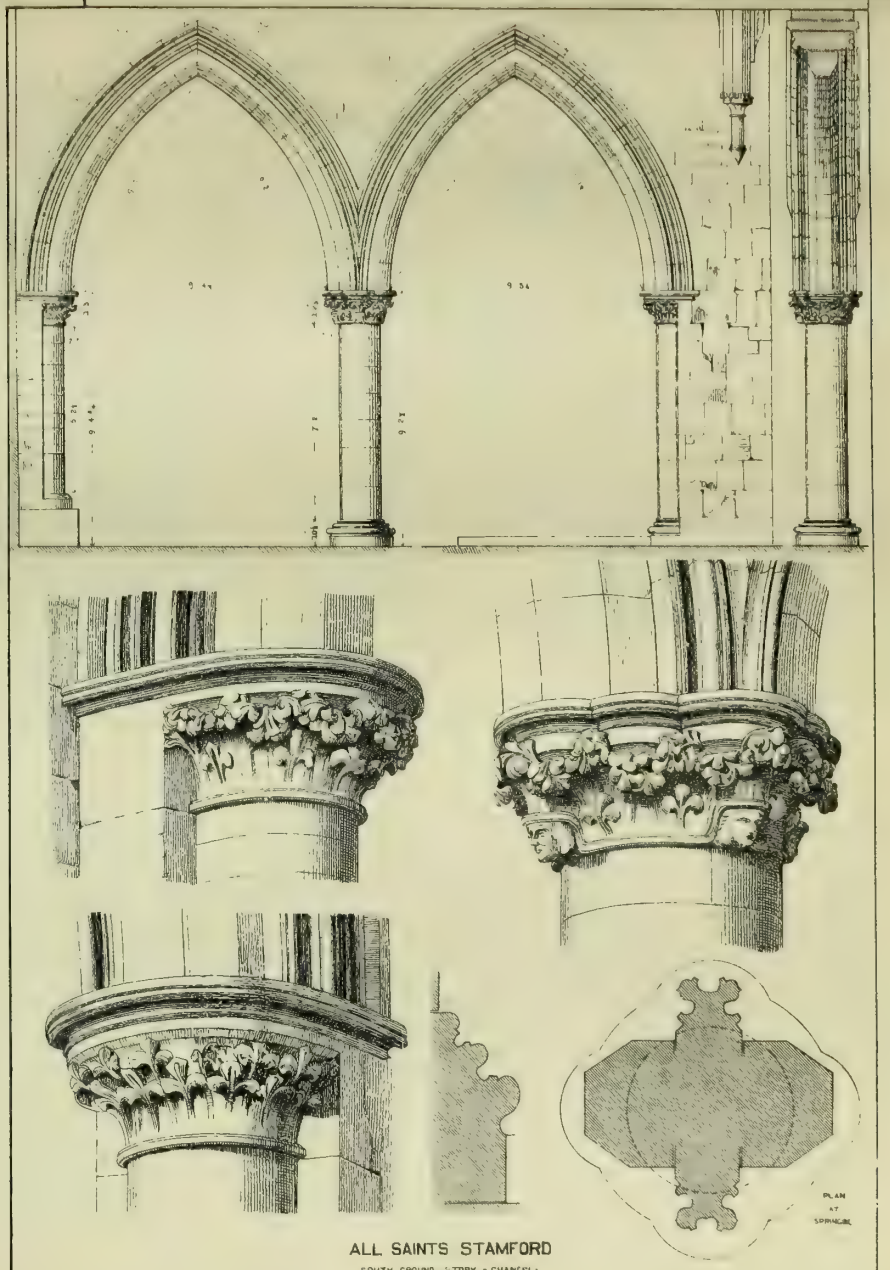
HICHAM FERRERS
WEST PORCH



RAUNDS
SOUTH WEST VIEW



HIGHAM FERRERS
WEST PORCH — SECTION AND DETAILS



ALL SAINTS STAMFORD
SOUTH GROUND STORY - CHANCEL -

CHURCHES OF THE NENE VALLEY NORTHAMPTONSHIRE

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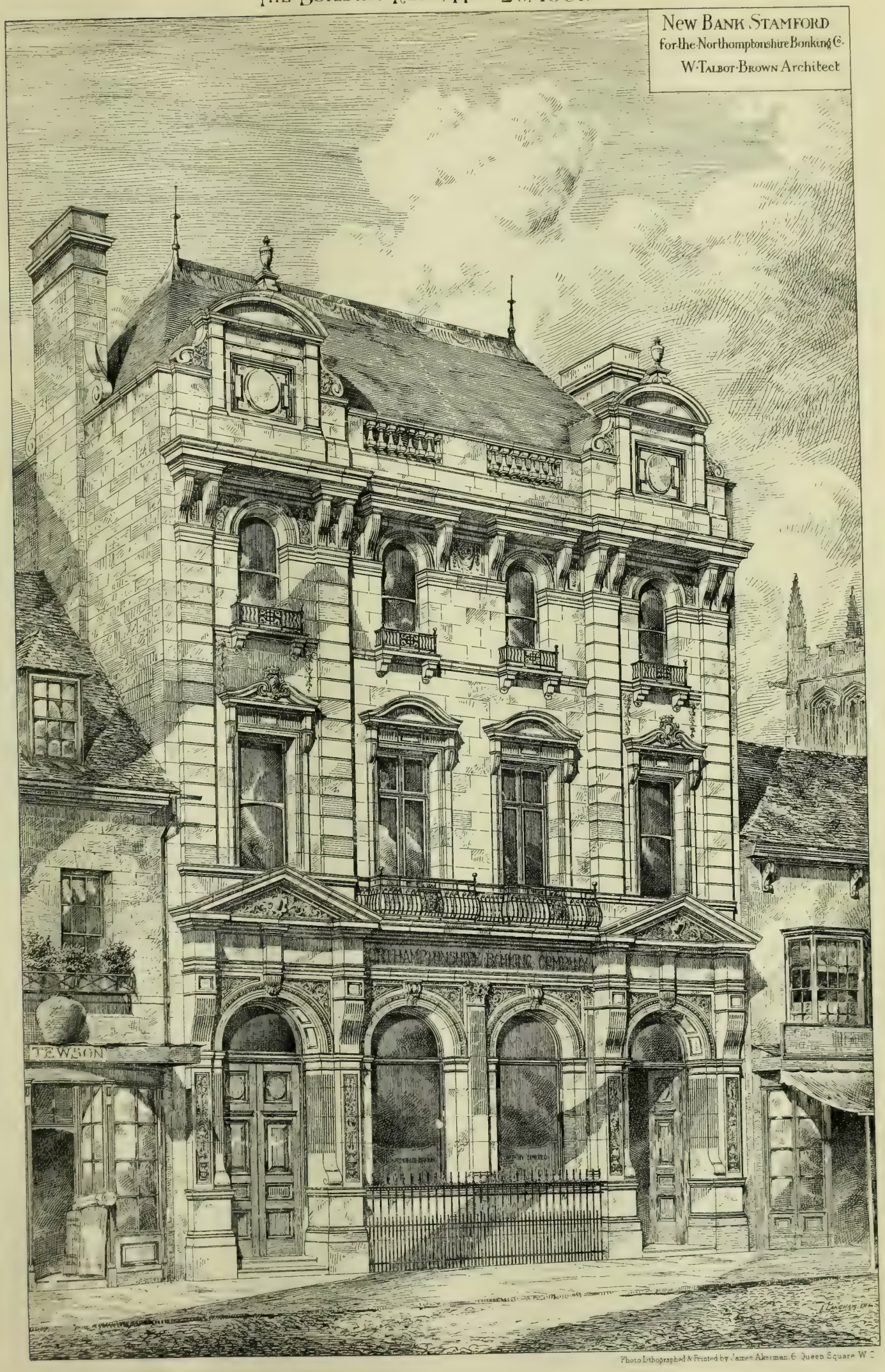

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TRURO CATHEDRAL.

A MEETING of the General Committee was held at the Bishop's Library on the 10th inst., at which the Lord Bishop of Truro presided. Mr. John Loughborough Pearson, R.A., the architect, was present, and read the report he had prepared, relative to the nature of the various stones whose names had been mentioned as suitable for the new cathedral. The paper was a pre-eminently practical one, and the following is the substance of it:—

In endeavouring to determine the kind of stone to use for the exterior of the Cathedral, I have been not a little influenced by a very anxious desire to employ some native stone, and I therefore made inquiries in every direction, and have had specimens sent up to me of all those most likely to be useful. I have also had the quarries inspected from which some of these specimens had been procured, and I have also had the stones, where they have been used for building purposes, examined, with a view of ascertaining their quality and their capability to resist the influences of the weather. I have also had some of these stones worked, to ascertain the amount of labour which must be spent upon them to shape them into required forms.

The result of the information which I have thus obtained is, I regret to say, that I am obliged to be satisfied that there are no stones in Cornwall or near it that can, with the means at my command, be used for the Cathedral, either externally or internally, for the decorative features.

Firstly. Because of their hardness.

Secondly. Because they are (except in the case of the granites), of such a nature that no large blocks can be got, and that even those that can be procured cannot be depended upon, in consequence of the vents which run in every direction through them, and these vents are not seen even when a stone is in the hands of the mason, and many days of labour may be spent on it before it separates, and thus becomes useless. The stones also come out of the quarries in such irregular forms (compared by practical men to "horses' heads") that at least one-third of it brought on to the site as block stone, and paid for as such, would be wasted in reducing these ungainly shapes into those required for the mason.

And thirdly. Therefore their great cost.

The elvans generally spoken of as being useful are the "Wild Duck," "Pentewan," and "Newham."

The Wild Duck is a good-looking stone, and I should recommend its use if it could be got in quantities equal to the samples sent to me, and provided the cost of working it were not so great, and provided it was free from the vents I have referred to. This stone seems not to be a favourite, even in the neighbourhood of the quarry, for it has not been used there except in small features. There would be no certainty of getting any quantity of this stone, and no hope of getting it regularly, and certainly no hope of getting any blocks of it of sufficient size for the purposes of the Cathedral.

The Pentewan is also very nice-looking, and I should have liked to have used it for the outside of the Cathedral; but there are the same objections to its use as there are to the use of the Wild Duck; indeed, there are greater, for the supply of this stone is rendered so exceedingly uncertain in consequence of its having to be conveyed by water in small boats, which can only get up to the cliff where the quarry is situated in certain states of the tide, and in favourable winds; and then no stones of any size can be obtained, for if a larger block than usual be raised in the quarry it can only be got into the boats by being reduced. Efforts appear to have been made at various times to work a quarry of this stone away from this cliff, and in a more accessible place, but without any success. The very large mass of earth, &c., which has to be removed before the stone can be got at would make the quarrying of this stone both difficult and costly.

Among other inquiries I made about this stone was one of Mr. St. Aubyn, and in his reply he says:—"I have never used Pentewan stone in any large quantities, I am therefore unable to give you any reliable information about it. I know it is very difficult to get at, and I believe large stones are not obtainable."

The Newham stone is a particularly nice stone, but the quarry appears to have been worked out, or nearly so, of all the good stone. No reliance can therefore be placed on getting more than a very small quantity to meet the requirements of the Cathedral.

Another stone has been suggested, the quarry of which is not far distant from Truro, called Seveock; but of this stone the same may be said as of all the other elvans, and with these additional reasons against its use—that it is so hard and unyielding that the labour upon it would be equal to that upon the hardest granites, and it is so covered with black spots that its effect in a large building would be extremely unsightly.

The "Mabe granite" is well adapted for any engineering works, or in work where only plain square stones need be used; but even in such plain and simple works its cost is from two to three times the cost of Doulting-stone. It would, therefore, be quite out of the question to use it for the Cathedral, which must have sunk and moulded work about it in every part. An idea may be formed of the cost of this granite from the fact that Mr. Freeman's reduced price for the preparation of the foundation-stones laid at the east end of the Cathedral was £8, or equal to more than 10s. a cubic foot, and that for a stone perfectly plain and for another with only a chamfer upon it.

The St. Stephen's is a soft granite, but very liable to decay, and therefore I cannot recommend its use for external work. This granite for mere *plain faces* would not cost more than Bath stone.

Despairing of getting any stone in Cornwall that would be suitable for the work of the Cathedral, the cost of which would not be greater than that of stone to be got out of Cornwall, I turned my attention to three or four kinds that are much used in all parts of England.

My original estimate of the cost of the Cathedral, as stated in my report, was based on the value of Bath stone, and, in endeavouring to adhere as nearly as possible to that estimate, I am limited in the choice of stones, for nearly all the other stones out of which a selection might have been made are much harder to work, and are therefore in labour alone more costly; as, for instance, Portland, which is an admirable stone, but yet not quite free from defects upon which a climate like this would act injuriously.

The Hamhill stone was the first to present itself to my mind, on account of its colour and character. I have most pleasing recollections of the effect of this stone at Sherborne Minster, in the "Golden Choir"; but, upon making inquiries about the weather qualities of this stone, and after having had the quarries examined, and the buildings about the neighbourhood of them, and in other places in which this stone has been used, it appears that this stone is not to be relied upon for resisting the influence of the weather; some of it stands the weather extremely well, yet some does not, and the deep yellow veins, which give so striking an effect to this stone, wash out to some depth, and in the course of a few years. It is also a difficult stone to work, for it is apt, except with the greatest care on the part of the workmen, to separate, and that this is so may be observed where this stone has been used, for the cement employed to stick the parts together which had become so separated during the working is seen projecting, the stone having decayed away from the cement. The cost of this stone, with the labour upon it, would be greater at Truro than Bath stone.

The Doulting stone in colour and texture is very good, and it is not at all difficult to work, and I should have been pleased to have recommended its use, had not my inquiries as to its weather qualities led me to think that, as there is some uncertainty about it, and that as it is only out of a particular part of the quarry that the right stone can be got, I should scarcely be justified in doing so without, at the same time, pointing out that there are buildings erected in which this stone shows distinct signs of decay, whilst there are others which do not. Great care would have to be taken in the selection of this stone, as was the case at Bristol, where it was used both outside and inside in the rebuilding of the nave and west end of the Cathedral, and where it thus far shows no signs of decay.

The Tisbury or Chilmark is also a good stone indeed—a better stone for colour and texture than the Doulting. It has been and is still extensively used. Salisbury Cathedral is built of it. There are four distinct varieties of this stone. It is an excellent weather stone. But its cost would be more than that of Bath. The "hard bed" of this stone would cost as much as Portland for the labour, whilst the soft bed only about half as much, or scarcely as much as Bath; so that the average cost would be more than Bath.

The Bath stone I have made many very careful inquiries about, esspecially with reference to the effect of sea-air upon it, and I have come to the conclusion that this stone, if properly selected and placed in the building on its natural bed, will stand perfectly. I only recently inspected a church built by Mr. Street, at Bournemouth, with a lofty tower and spire. It was begun 20 years and more ago, and although it is exposed to the direct action of the sea-air, I may almost say of sea-water, I could not, after a very careful examination, discover a single stone that showed a sign of decay; but, on the contrary, I found it had acquired a hardened surface, on which the weather seemed to have no influence, and I found it had deepened in colour to a rich yellow tint, toned down in places by a grey lichen which had grown on its surface, and which is a sure sign of a good weather stone.

Having described the character of the several stones that have come under my notice, I will now go into the question of their cost; and here I may add that, being very anxious that no mistake should by any chance be made at the beginning of the work as to its ultimate cost, I worked out all the details of every part of the choir division, and the details which work into this division belonging to the second and third divisions, and I have had the quantities of the materials in the first division taken out by a surveyor, and having obtained carefully-prepared schedules of prices, I have been enabled to price out the cost of the work very closely indeed, and the result, I am glad to say, shows that my rough estimate in the first instance was very nearly accurate. I was not a little surprised at this, for anything more difficult to arrive at in a rough way than the cost of a cathedral, with all its complications and novelty of size, I can scarcely conceive.

The estimates stand as follows—for the 1st division:—

	£	£
No. 1.—In Bath stone inside and out—total cost		31,856
In Doulting stone outside and Bath stone inside	35,350	
No. 2.—In Doulting stone inside and outside		36,250
In Hamhill outside and Bath stone inside	37,578	
No. 3.—In Hamhill outside and inside		39,587
In Wild Duck stone for outside only, assuming that it can be got and Bath stone inside	41,306	
No. 4.—In Wild Duck outside and inside		49,605
No. 5.—The Pentewan may be taken to be the same as Wild Duck, provided also that it can be got, and at a reasonable rate.		
No. 6.—In Newham stone outside and Bath inside	41,456	
In Newham stone both outside and inside		49,948
No. 7.—In St. Stephen's granite outside and Bath stone inside	42,656	
In St. Stephen's granite outside and inside		52,732

If Mabe granite be used for the outside, and assuming that it is only as hard again as the St. Stephen's, £20,000 would have to be added to the cost of St. Stephen's.

Taking all things into consideration, I come to the conclusion that Bath stone of the best quality is that which I should recommend to be used in the building of the Cathedral.

10th May, 1881. JOHN L. PEARSON.

After the reading of this report, an animated discussion took place as to what stone should be used. The Lord Bishop said Mr. Pearson had taken immense pains in the matter, and made a great mass of calculations, and had consulted a surveyor on the subject and practical contractors, and he was satisfied that Bath stone had all the qualities that were necessary for them if care were taken in the selection of it. The only stone spoken of in comparison with it for the outside was Chilmark stone, which might be a little better, but it would cost £4,000 more, and he did not see where that extra money was to come from. He thought the public would be wise enough to leave a matter of this kind to experts, and they would not be doing their duty if they did not take the advice of their architect; they were in the hands of one of the greatest architects of the day, whose ability was not only shown in his designs, but in the accuracy of his calculations. He thought they would do very

wrong if they threw the whole question into the waves of agitated opinion, when they had been especially charged by the county to do the work. He thought that Committee was quite competent to receive the report and act upon it.

In reply to Mr. Chirgwin, Mr. Pearson said he would not recommend Bath stone in preference to others if there was no money difficulty. In point of colour, Chilmark would be preferable.

Mr. Williams said there was a very strong prejudice against Bath stone in the county as to its durability.

Ultimately, it was decided that the matter be adjourned for a fortnight.

Canon Wise then asked how far it was wise to retain the skeleton south wall of the old church, which was now left standing. He presumed it would involve additional expense to restore it, as all the carving was mouldered away, and there was really no old architecture about it. He should like to know whether it was worth while bolstering it up, refurbishing it, or keeping it there at all. He would have done with it altogether.

Mr. Nix said he was told by the clerk of the works that it would require new foundations throughout, and they would have to pay the men double wages to do the work.

Mr. Pearson said he still held the opinion expressed in his original report, that it would be desirable to retain it. He should grieve beyond anything if it were done away with. It would have a serious effect upon his design, both inside and outside, if they took it down, and if they had anything in its place it would be quite as expensive. It was quite possible to restore it.

The meeting then terminated.

The works at the New Cathedral are steadily advancing, under Mr. James Bubb's (the clerk of the works) directorship.

PARTICIPATION OF WORKMEN IN PROFITS.

A CONFERENCE, convened by the Committee of Clergy on "Trade Unions and the Church," was held on Friday night in St. John's Schools, Fisher-street, Red Lion-square, the question for discussion being "Is Leclaire's system capable of adoption in England?" The subject was introduced by Miss Hart in a paper on Leclaire and the system he successfully carried out, by which his workmen were made practically partners in his business. The tomb of this captain of industry, she said, bore the simple epitaph "Leclaire, contractor and decorator; born 1801, died 1872;" but his monument must be sought among the living. In the heart of Paris might be seen the industrial partnership he developed, growing each year more and more prosperous; the workers, inspired by hope, giving thorough, honest work, the old "hands" not cast off like worn-out old tools, but, the days of labour ended, passing the closing years of life in peace and independence. The son of a poor village shoemaker, Edme Jean Leclaire was taken from school at the age of ten. He earned his living for seven years in the fields, then started for Paris, and there apprenticed himself to a house-painter. In 1827 he set up in business on his own account, with a capital of £40, and two years later got a contract to paint and glaze seven houses for £800. Acting on the principle of giving high pay for good work, he paid 4s. 2d. instead of the current rate of 3s. 4d. a day to his men. The work was so well done that the first stone of his fortune was laid. Adopting an idea suggested to him by M. Fregier, he in 1842 made a division of profits calculated on the earnings of the previous year, and divided £475 among 44 men. Miss Hart then gave an account of the various stages through which the system passed until "la Maison Leclaire" was put on its present footing in 1869. The principle of participation with Leclaire meant a great deal more than "sharing profits"; it meant "sharing responsibilities"—it meant the moral and social uplifting of the wage-earning class—and he brought the principle into operation in such a form as to make it constitute an education for those brought under its influence. The *noyau* now numbered 130, of whom 103 were skilled workmen and 27 clerks. In answer to inquiries as to the conduct of the workmen members of the firm, who are subject to the decisions of a "committee of conciliation," M. Robert had informed her that from February 21, 1879, to July 23, 1880, there were six cases of delinquency. Two men, who had committed grave offences, were punished by dismissal, and of the other four delinquents, one received a warning, two were visited with suspension respectively for five and 15 days, and the fourth for 18 months. There had been no case of drunkenness for several years. This was in a firm with 900 workmen on the books, in addition to the 103 constituting the *noyau*. Leclaire left a fortune of £48,000, and had divided among his men individually and collectively £44,000. He removed the antagonism between capital and labour by creating a bond of union between master and men. In 1880 the returns of the firm were £100,000; £34,715 was paid in wages, £6,400 in bonuses, and £3,200 was handed over to the workmen's mutual aid society. Since 1842 there had been paid to the benefit of the workmen £104,000. An instructive discussion followed, in which representatives of capital and labour spoke.

THE HERBERT EXHIBITION.

OF the various exhibitions of pictures open to the public, few probably will possess more interest to the decorative artist than the Herbert collection open at the Hanover Gallery, New Bond-street. This collection includes the wall painting intrusted to Mr. Herbert, R.A., shortly to take its place on the wall of the Peers' Robing Room, and is the second of the series of paintings by this artist. It is intended to occupy the space next to "The Delivery of the Law on Mount Sinai." In the present fresco, the artist has represented the boy prophet, Daniel, in the act of averting injustice against the innocent; he is shown standing on the marble steps, and demanding that the false elders who had accused Su-anna, should be questioned separately. The accusers are self-convicted; one said she was seen under a mastic tree, and the other that he saw her under a holm-tree. The painting depicts the two elders, one in the background found guilty of falseness, and the other standing in the judgment place, held by the executioners, while he has been convicted out of his own mouth. The boy Daniel, in a garment of rose colour and green, is the centre figure, and points with a frown on his countenance to the guilty man, while Susanna, in white robes, on the left side, is standing in a devout attitude, her eyes cast upwards, while the scribes on both sides are shown perplexed at the result. The other figures which crowd the canvas are subordinate to these groups, and the painter has skilfully concentrated interest on the leading actors in the scene. The condemned elder, pallid and terror-stricken, in the hands of the executioners, is thrown into shade, while beyond, the market-place is thronged with people, heedless of the scene going on. Mr. Herbert has been happy in the architectural background, where the palace, with its colonnades and terraces, are depicted, and the only hesitation we feel is in accepting the key of pale colouring adopted, which must, however, be judged by the circumstances which have controlled the painter. Deeper tones would have been fatal to the subject, and the scanty light available had to be made the most of by light delicate tints. The predominant colours are red, green, and blue in the draperies, but these are well harmonised. The other great picture exhibited, "Moses Bringing Down the Second Tables of the Law," is full of expression and action in the figure groups, but the composition is more scattered and less masterly. There are several other pictures painted by Mr. Herbert, the owners of which have lent them for this exhibition. "The Procession of Brides of Venice," "Trial of the Seven Bishops, 1688," some fine landscapes of Hampstead, painted in 1861, and a number of other Scriptural subjects, executed many years ago, will be looked upon with interest.

St. Margaret's Church, Durham, is to be reopened on Monday next, after restoration, reseating, and enlargement. Mr. Hodgson Fowler has been the architect, and Mr. G. Bailes, the builder.

A maritime sailors' rest is about to be built at Point Law, Aberdeen. It will be constructed of corrugated iron, lined and furnished with inodorous felt and dressed pine. The tender of Messrs. A. J. Young and Co., engineers and contractors, Manchester, has been accepted for the shell at £207 10s., and it will be furnished by local firms.

Building Intelligence.

Attleboro'.—On the 28th ult., the fine old church of St. Peter, Attleboro', Northamptonshire, was reopened by the very Rev. Lord Alweyn Compton, Dean of Worcester. The church, which is one of great interest and beauty, has been very carefully restored, and "The story of the Restoration" is ably told in a pamphlet of some seventeen pages, by the Rev. Thomas Grabham, the rector. The whole of the roofs are new, and the whole of the seating, which is of oak, is a careful reproduction of the old. In the chancel the old stalls, with miserere, have been repaired and refixed. The body of the church has been restored by the parishioners at a cost of £2,500; the chancel, by the Marquis of Bristol, at a cost of £500. The architect was Mr. Peacock, of London, the builders, Messrs. Henson, of Finedon, Northamptonshire.

Birmingham.—The new church of St. Alban the Martyr, in Conybere-street, was opened on Tuesday week. The style is an English type of Early Thirteenth Century Gothic freely treated. The plan is cruciform, and consists of a nave and aisles, 32ft. long and 52ft. wide internally, the width of the nave itself being 23ft. 6in.; western portico; north and south transepts, 17ft. wide, opening into aisles and eastern bay of nave. The chancel is same width as nave, and 48ft. long to the extremity of the apsidal termination, and is surrounded by an ambulatory. South of chancel is a chapel 30ft. long and 18ft. wide. The northern arm of the transept has an eastern aisle 11ft. 6in. wide. East of this is the organ-chamber, to the north of which vestry accommodation is provided. The west front contains a row of five lancets surmounted by a wheel window, nearly 16ft. diameter across. The western bay of the south aisle is the lower portion of the tower, now carried up some 25ft., but which is designed to rise about 125ft., and crowned by a small square spire rising to a total height of 170ft. The church is built of local red bricks, specially made of a smaller size than usual. The walls inside are partially faced with stone and partially with the same red bricks, the more prominent parts and the vaulted ceiling being all of stone. Bath-stone is used for all dressings, both inside and outside. The roofs are covered with plain red tiles. The floor is laid with wood-block flooring, and the passage-ways with red tiles. The church is seated with chairs. Mr. J. L. Pearson, R.A., of London, is the architect, and the work has been superintended by Mr. N. W. Vickers. Mr. Shillitoe, of Doncaster, was the builder.

Chideock.—The parish-church of St. Giles, Chideock, has been renovated, under the direction of Mr. G. R. Crickmay, of Weymouth, the diocesan architect. All, save the chancel part, is now complete. The building is in the main Perpendicular Gothic, and consists of nave, south aisle, and porch, north transeptal chapel, chancel, and an embattled tower. The aisle and nave are divided by a good arcade of four bays, which was upwards of 12 inches out of the perpendicular. This has been put straight, a modern vestry has been removed, and the gallery has followed it. Mr. Beer, of Wareham, was the builder. The floors are of Purbeck stone, bordered with black and red tiles, supplied by Messrs. Carter and Co., of Poole. The chancel arch has been widened and heightened. The stone carving and sculptured figures are by Mr. Harry Hems, of Exeter. The oak seating has been re-fixed. Mr. Cooper was the contractor's foreman during the works in hand. The cost up to the present is about £1,500.

London Technical College.—Prince Leopold, on Tuesday week, laid the first stone of the City and Guilds of London Technical College, Finsbury, a building adjoining the Cowper-street Schools. The new college will be a plain building, in the Classical style. It will contain 32 rooms, comprising a large laboratory, two lecture-theatres, class-rooms fitted with appliances for teaching various branches of physics, chemistry, and mechanics, rooms for drawing, professors' rooms, workshops, an engine-room, and clerks' offices. The cost of the building and fittings is estimated at £20,000 or £25,000. The central building is to be at South Kensington, in the neighbourhood of the museums. The building

at Finsbury, of which the first stone was laid on May 10th, is designed to meet the special requirements of the City. Mr. Clifton is the architect and Mr. Peto the builder.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Society of Antiquaries of Scotland.—At the monthly meeting of this Society, held on Monday, a paper was read on undescribed cup-marked stones in the neighbourhood of Inverness, by Mr. William Jolly, H.M. Inspector of Schools, Inverness. They are all found on the south shores of the Moray Firth, within a radius of twenty miles of Inverness. The carvings are generally of the simplest type, figured by the late Sir J. Y. Simpson in his work on archaic sculpturings—viz., plain shallow cups of varying size, sometimes surrounded by single rings, and occasionally with connecting gutters. Some are connected with larger hollow basins carved in the stone. They are mostly on sandstone, but occasionally in harder and unstratified stones. The number of cups on single stones varies from one to one hundred and thirteen. They occur on stones connected with standing circles and with chambered cairns, and on separate monoliths; and for the first time in Scotland these sculpturings have been discovered in connection with churchyards, in which they have been utilised for monuments and gravestones. Mr. Jolly described with great minuteness of detail a large number of cup-marked stones which are associated with chambered cairns at Clava, Culbirnie, and Corriemony, a still larger number associated with stone circles, or carved on the stones composing the circle, examples of which occur at Gask and Tordarroch in Strathnairn, at Kiltarlity, near Beauly, &c. At Little Urchany, near Cawdor, Mr. Jolly found several cup-markings on a granite monolith forming one of the stones of a circle. Many were found on isolated stones. The largest of these is a stone called Clachmore, at Culnakirk, Glen Urquhart. It is 16ft. long, above 9ft. broad, with an average thickness of 1ft., and has on its upper surface no fewer than 113 cups, 20 of which are from 2½ to 4¼in. diameter, and from ½in. to 1⅛in. in depth, many of them being united by distinct grooves. Other stones similarly marked, though the markings are fewer in number, were described from Clava, Moniack Castle, and at Kirkton, Bunchrew, which had been brought from Rhynie, Aberdeenshire. The most remarkable fact ascertained by Mr. Jolly was the occurrence of these cup-marked stones in several of the churchyards of the district, as in the old churchyard of Barevan, at Cawdor; in Braeclich churchyard, near Fort-George station; in the churchyard of Dunlichity, and in that of Glenconvith, near Beauly. Other cupped stones, like St. Columba's Font at Abriochan, seemed to have been originally ecclesiastical, and one at Dunlichity was used within the memory of persons living as a baptismal font. Drawings of no fewer than 65 stones of these various classes were exhibited. In connection with Mr. Jolly's paper the Rev. Dr. Joass, of Golspie, sent for exhibition to the meeting a cast of a cup-marked stone recently found at Dunrobin, and stated that he only knew of five such stones in Sutherland.

Yorkshire Architectural Society.—The annual meeting of this society was held on Tuesday week, the Rev. J. R. Lunn, in the unavoidable absence of the Dean, in the chair. Mr. G. Hodgson Fowler, F.S.A., of Durham, had prepared a paper on Salton Church, which, in his absence, was read by the local treasurer. Salton church appeared to have been erected about the year 1100, but there was no record of the date. Early in the 13th century the building was greatly damaged by fire, but was restored on a grander scale, and in the 15th century other improvements were carried out in the edifice. At the Reformation the old church suffered during the change from certain ill-advised alterations. Having noted the renovating work effected in 1639, the writer proceeded to give a general idea of the history and state of the building, describing its main features. The Rev. G. Rowe next read a paper on "Walter Giffard, Archbishop of York, A.D. 1266—1279." The Rev. J. R. Lunn read a paper on Marton-cum-Grafton Church, which he described, stating that it was of 12th-century architecture. It was repaired and altered in 1722. Probably it was dedicated to St. Michael and All Angels. In the demolition of the old fabric to build a new church several interesting antiquarian discoveries were made, which had been carefully preserved. The new church was an example of as conservative a restoration as could well be met with.

Birmingham Architectural Association.—An ordinary meeting was held on Tuesday evening, the 10th inst., at the Rooms, Queen's College, under the presidency of Mr. R. B. Morgan, chairman of the Association. A vote of thanks was accorded to Messrs. Wood and Kendrick, architects, of West Bromwich, for conducting the members over the New Mission Church of St. Michael and All Angels, on Saturday, the 30th ult. A paper on "Renaissance Architecture," was read by Mr. Oliver Essex. After the paper a discussion took place, and a hearty vote of thanks was presented to Mr. Essex.

PARLIAMENTARY NOTES.

The National Gallery.—Mr. Coope, on Friday last, asked whether the Government was prepared to carry out the further extension of the buildings of the National Gallery, for which plans were prepared some years since by Mr. Barry, so as to provide sufficient space not only for those paintings already in the possession of the nation, but also for such additions as might be made from time to time by gift or bequest. Lord F. Cavendish: No application has been received from the Trustees of the National Gallery for further space. There is, therefore, no present intention on the part of the Government to propose a further extension of the buildings of the National Gallery. Mr. Coope said in consequence of the noble Lord's answer he would give notice that on going into Committee of Supply he would move that it is desirable that immediate steps be taken to carry out the further additions to the National Gallery which were necessary to provide for the present collection, and for future additions.

Memorials in Westminster.—Mr. Macdonald, on Monday, asked the Financial Secretary to the Treasury whether it was true, as stated in the public journals, that the fees paid to the Dean and Chapter of Westminster Abbey for permission to erect a monument therein to the late Earl of Beaconsfield would amount to about £400; and, if so, whether those fees would be the private emolument of the Dean and of the members of the Chapter, or to what purpose they were applied. Lord F. Cavendish: In answer to an inquiry which I have made into the statement quoted by my hon. friend, I have been informed that there are no fees whatever paid to the Dean and Chapter for monuments erected at the public expense. Any fees for private monuments are expended entirely on the support of the fabric, and no portion whatever goes to the private emolument of the Dean or of any member of the Chapter. I am obliged to my hon. friend for asking me this question, and thus enabling me to remove an entirely erroneous misconception on the subject.

Cement Manufactures.—Mr. Warton, on Monday, asked the President of the Local Government Board whether he could state the number of workpeople employed by cement manufacturers in England; and whether any complaints had been received by the Local Government Board from inhabitants of parishes where cement works were carried on. Mr. Dodson: I have no information as to the number of workpeople employed in cement works in England; but as far as I have been able to ascertain there are altogether between 100 and 150 of such works. The Local Government Board have not, so far as I am aware, received any formal complaints from sanitary authorities where these works are carried on; but complaints were made by residents before the Royal Commission, and the Board themselves have received complaints of the injurious effects of these works from persons affected by them, and notably from the pilots and others interested in the traffic of the River Thames.

Wycliffe Baptist Chapel, King's-road, Reading, was opened for worship on Wednesday week. It is Byzantine in style, and the plan is that of an oblong, with the angles rounded off internally. The chief part is of red and grey bricks, with moulded brick dressings, and a portico in Corsehill stone. The chapel seats, including a gallery surrounding three sides, 600 persons, and the cost has been £3,600. Mr. W. Ravenscroft, of Reading, was the architect, and Mr. Charles Filewood, of the same town, the builder.

A new exhibition gallery is being erected at the British Museum for H.M. Office of Works. Messrs. McLachlan and Sons are the contractors.

A Hundred Thousand Replies and Letters on subjects of Universal Interest have appeared during the last ten years in the ENGLISH MECHANIC AND WORLD OF SCIENCE, most of them from the pens of the leading Scientific and Technical Authorities of the day. Thousands of original articles and scientific papers, and countless receipts and wrinkles embracing almost every subject on which it is possible to desire information have also appeared during the same period. The earliest and most accurate information respecting all new scientific discoveries and mechanical inventions is to be found in its pages, and its large circulation renders it the best medium for all advertisers who wish their announcements to be brought under the notice of manufacturers, mechanics, scientific workers, and amateurs. Price Twopence, of all booksellers and newsvendors. Post free 2½d. Office: 31, Tavistock street, Covent-garden W.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

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N.B.—Cases and vols. must be ordered through a bookseller or newsagent, as the regulations of the Post-office prevent them from being sent by post.

Received.—B. of T.—B. and P.—C. H. and Co.—G. E. H.—J. and J. G.—J. A. E.—M. and J. S. H A.

Correspondence.

ARCHITECTURE AT THE ACADEMY.

To the Editor of the Building News.

Sir,—In your last number, a correspondent objects to the style of getting up architectural drawings as exhibited at the Royal Academy. From his opening paragraph, I would infer that he is not an architect by profession. He compares, I consider, very unfairly the architectural drawings with the paintings and other works exhibited there. It is to be remembered that architecture labours under the disadvantage, when compared with those, that it alone is represented by unfinished work: the real exhibition of architecture is to be found in the buildings themselves. To compare the arts fairly in the exhibition of the Academy, painting should be represented by the first sketches, which in many cases are in monochrome or charcoal; and sculpture by the first sketches or models in clay on a small scale. Again, granting that it is possible to represent the buildings in a more artistic manner with colour, can it be expected that if the architects have their eyes and hands so practised to execute them thus, they would also be able to have that thorough knowledge of the practical work which is more important? The Academy at present, and I consider rightly, gives a preference to those drawings executed by the architects themselves, showing that the employment of professional artists for getting up perspectives is discouraged. This was the method generally adopted only a

few years ago, and is still used amongst a certain class of architects for competition purposes, plenty of colour and bad drawing being the rule. Since a large proportion of the drawings exhibited in architecture at the R.A. are competition works, it is to be hoped the old method will not revive, a large amount of fraud being perpetrated by representing the building materials of colours different to those intended to be used, of introducing skies, fore and backgrounds not in keeping with our climate, and in general in representing in the drawing a harmony or contrast of colour which could not be found in the real thing. The artistic and honest water-colour drawings of Mr. A. Waterhouse and a few other architects are not to be classed with these: they are neither made for purposes of competition nor deception, but are such as I believe your correspondent would like to see general. This should not be the case, for though good in themselves, they would lead to that style for competition work which has already been condemned.

It should be remembered that more and better colour has been used in architecture with the use of simple black and white for the perspective drawings, and colour should be more surely felt in the building than in its representation. Further the use of black and white has brought in the use of truer and better drawing, and many, so far from being "lifeless," are so good that the majority of exhibitors in painting would fail to equal them were they to try. Since the days of Albert Dürer, no artist, on the authority of some, has been equal to Mr. R. Norman Shaw in drawing with black and white, and he, though the best, is only one of several, whose productions do not deserve such an epithet.—I am, &c., H.M.

THE ROYAL ACADEMY AND ITS TEACHING.

Sir,—A very great deal has been said at different times about the Royal Academy; but, perhaps, no one has said anything better, or more encouraging, than did President Leighton the other evening at the annual dinner. Not to dwell on his kindly notice of those whom death has taken away—for none, it is certain, are spared: the high and the low, the wise and the simple, those who are successful, and those who utterly fail, all disappear in their turn. None were forgotten—and I would but add a word to what the President said about William Burges. It is certain that no more enthusiastic lover of art and "Mediæval" architecture existed, or exists. "Gothic" architecture was in him, and had he risen suddenly from the midst of the Middle Ages, he could hardly have been more of a "Goth" than he was. I often battled with him on this theme, and urged the impossibility of reviving a dead style of architecture in the way now attempted, as that of the revival of a dead language. As simply a teaching element, all is well enough. In this he agreed, and I feel quite sure that no better way of keeping in grateful remembrance an enthusiastic artist could be devised than in the judicious and the thoughtful carrying out of Sir Frederick Leighton's Academy School plans and suggestions. I would, therefore, by way of *in memoriam*, say a few words about this new plan, and would plead for a little alteration in its terms. On this subject, practically, of this programme of the new Academy School, as sketched out by the President, how much might be said? As a painter, he will not refuse the aid, in words, at least, of any who have been occupied with practical work, and in concert with those who, nowadays, do the actual work of art, and certainly of architecture. I may fairly say I have had some little personal experience, and have given the whole subject more than ordinary thought. There are broadly three subject-matters for consideration—Architecture, Sculpture, and "Decorative" (if we may use the term in place of a better) Painting, or *mural* painting, as Sir Frederick Leighton put it. It is impossible to do justice to so vast a theme in few words, so that I would confine my remarks at the moment to Sculpture, in the Academy sense of the term, and to this would add *carving* in its architectural sense. To leave the Academy School for a moment. It is well-nigh impossible to witness a more melancholy sight, or to contemplate a more sad waste of time, than is to be seen, on any day, than that of the many industrious students in the British Museum, and other places, spending, as they do, so many, many hours, and days, and even weeks, in the elaborate, and never-to-be-finished "stippled" drawings of the many antique statues, from the famous "Torso," to others of them, which would seem hardly worthy of so much, and such close copying. In not a few cases, this costly draughtsmanship resolves itself into the simple trouble of covering so much paper surface with with one even chalk tint—the very outlines of the limbs at times almost forgotten, in the work of getting an even chalk-covered surface. Surely this must be a mistake; for what is the final object of the would-be and future sculptor, but not only to know, in detail, a something of the human form, but to be able to render it in the round, as it is sometimes termed—to model it, as recommended by the President—and, finally, to cut it out of the solid block of stone or marble? It is but the means to an end, or rather the learning to do a somewhat towards the realisation of that end. But even if successful, at what a cost of time and trouble, and how entirely different from the way of work of those who themselves brought into existence those very antique figures themselves, and from which we get, or are supposed to get, so much instruction and inspiration. All know what this method is, and all must have seen it in action, and must seen the results of it. Is there no better plan, I would ask, and if there be, would it not be worthy of trial, in a school so famous as that of the Royal Academy? I have had, it is true, but a limited and short experience of a plan of doing this work altogether different from this, and from the Academy art system as proposed. It certainly succeeded even beyond expectation, though so little of it. The student, or workman, in the first place, made a measured drawing, full size, if possible, in outline of the object, whatever it might be, with only just so much of "shading" as to render the drawing more emphatic, and more full of instruction, in the act of rendering it. He then went to work on the actual stone block itself, and made a copy, as far as his power over the material, and his aptitude in the use of hammer and chisel went, and could carry him. But details only can, perhaps, be undertaken first—as the head, or the arm, or the foot of a figure, or a single acanthus leaf, or a patera from the antique, or a bit of Gothic detail from a cathedral doorway—all, be it observed, genuine work, and unrestored work, for this last fearful process of restoration blots out and cuts away bodily, and washes out, the very impress of the hand and mind of the artist-workman who created the original work. This was not, it is true, the old way of work, either in Antique or in Gothic days; but it needs must be so in our own, for we nowadays live entirely in and on the copying of the past, and do but reproduce what those who have gone before have set us to copy.

I would, with all possible respect, commend this plan to the consideration of President Leighton, and his brother Academicians; they will find it on trial succeed past their expectations. My own experience was, it is true, so short, as to be hardly worth the citing; but the little I could venture on augured the best for the student, actually producing in his efforts to copy the model before him, archaic work, and a something real as a test of his power. I have supposed here that the student is a novice, both in drawing and sculpture, and has to acquire both, so that it must depend on the instructor to say when he may with advantage leave the paper, and go on to the "round." The President urged the modelling in clay. I can but hope that he will reconsider this item. I can assure him that it is not only useless, but takes up the time which might be so profitably spent on the stone, or wood itself. In a hasty moment, and to realise a fine thought, this clay may do its work in the hands of a Michael Angelo; but in feeble hands it but serves the worst of purposes—it hands over the real work, the work on the stone block, to the mere manipulative workman, and to those working with their hands only. It serves but to perpetuate that bane of the day and hour—the art-manufacturing mode of art-production now seen everywhere; but it should not be within the walls of the Royal Academy itself.

There is one other consideration here which must not be forgotten, and it is that the models, whatever they may be—whether figures, or foliage, or ornament—must be fairly representative of the antique objects from which they are taken. A fine plaster cast of the Torso, simply oiled, to give it colour, is all but as good for the purposes of the student and copyist as the marble original itself; but once cover this with coatings of paint or wash, all the real life and the genius in it simply vanishes! The handwriting of the artist workman of it disappears, and its great teaching power and inspiration as the work of such is gone. Good and untampered-with models for study would seem to be all-essential. I say this, in all earnestness, in face of the fearful work now going on at the British Museum and South Kensington, where all the "antiques" are going through a process, I presume to be systematically repeated, of washing and cleaning with strong alkalied water, scrubbed into the marble or stone by rough hands, and all but taking the marble surface, as well as the "dirt," as it is called, clean away from the object so operated on. All the colour—the antique colour—goes, too, at the same time; and it would be very difficult to find out a way better calculated to take all the "art-life," if I may coin a term out of the object so operated on. It is truly a cruel, new, and thoroughly modern device!

One word more, if I may say it, out of many. I have the most pleasant remembrances of the Royal Academy. I was there with the clever painter Millais, who promises every now and then so much—shall I say it?—a something really great, and would just allude to it for the purpose of asking the President, who tells us that he intends to personally interest himself in the new work, why he wishes with his council to limit the time of the studentship from seven to six years. Whom can this gratify or benefit? All must have been right glad to hear that the time had been extended to ten years, at the least, or even longer; for what artist is there who is not a student and a learner, to the very end of his life? or who is there who, having been a learner within the Academy walls does not wish, now and then, to see it and its art treasures again, if but for an hour; to catch again a glimpse of the Torso of the Vatican, or the Fighting Gladiator, or the full volume of the Liber Studiorum, and not a few other things not to be seen or got at elsewhere? How much, indeed, might the Royal Academy yet do for art and for artists without in any way damaging or lessening itself in the world's estimation, not, perhaps, by the following the common and beaten roads always, but by the showing to the outer world that there are others and untrodden ones?

C. Bruce Allen.

QUANTITIES.

Sir,—The inclosed is a copy of a letter I have just written to a client as to the present debated subject of quantities; which, if of use to others, is at your service.—I am, &c.,

J. P. Seddon.

1, Queen Anne's Gate, May 16.

1, Queen Anne's Gate.
16 May, 1881.

IN RE "QUANTITIES."

Dear Sir,—I advise you, 1st, to have quantities for your proposed work taken out, as it is *necessary* in such a case as yours.

2nd. To pay a fair price for them in consideration of the work done in preparing them, and not for assuming any responsibility as their correctness.

3rd. To accept that responsibility yourself, and to let them be made a part of the contract, for to throw the responsibility on the contractor is unjust, as, practically, he has to swallow them whole, having no means of testing them, unless, of course, in his contract he makes provision for the risk; and to throw them on the quantity surveyor is equally unjust, unless he be paid proportionately for taking that risk.

4th. Employ a quantity surveyor in whom you can place confidence, or direct me to do so, and believe me to be, yours faithfully, John P. Seddon.

THE FIRE IN THE HAYMARKET, CIVIL SERVICE CO-OPERATIVE SOCIETY'S STORES.

Sir,—I have to ask you to kindly insert the following reply to Mr. Thomas Verity's letter in to-day's Building News, which will end my part in this correspondence.

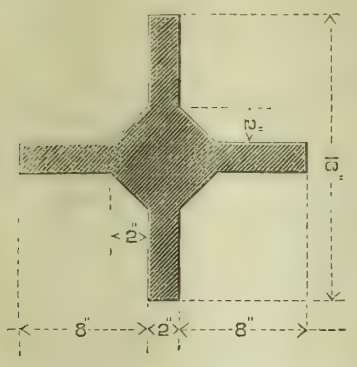
That Mr. Verity should have drawn such an obviously erroneous inference from my remarks in your previous number on the above subject I most sincerely regret.

My letter was simply written for the purpose of gaining more information upon a somewhat vague portion of an otherwise interesting and instructive article; which information is most kindly tendered in the remarks advanced to-day by Messieurs Verity and Max am Ende.

I should like to be allowed to elucidate, briefly, how I arrived at the result stated in my last.

From the subjoined plan, which plan formed the

basis of my computation, it will be seen that I get a sectional area of 76 square inches, and the breaking weight, assuming the length of stanchion (as I unhappily did) to be 10 feet, will be 27 tons per



square inch of section. These results now multiplied one by the other, and divided by the universal safety factor 10, will give the result I previously adduced—viz., safe load for such stanchions, 205 tons each.

After this explanation, Sir, there appear two duties that commend themselves to my mind as devolving imperatively upon Mr. Verity.

First, to admit that he is mistaken as to the real gist and purport of my remarks in dogmatically affirming that "Mr. Hurley ironically suggests" anything.

Second, to withdraw the said uncalled-for and infelicitous phrase.—I am, &c.,

ALFRED C. HURLEY.

4, Cumberland-terrace, Lloyd-square, W.C., May 13.

ST. BARTHOLOMEW THE GREAT.

SIR,—In your reporter's account of the meeting of the Conference of Architects at this church, he, in error, attributed the restoration which took place in 1864 to our firm. The work was done under the joint superintendence of Professor T. Hayter Lewis and the late Mr. Slater, and it was through our connection with the former at that time that we were enabled to exhibit the working drawings and describe the repairs at that time executed.—We are, &c.,

PERRY AND REED.

9, John-street, Adelphi, London, W.C.
May 17.

CHIPS.

The memorial stone of a new mission-room in connection with the Leeds parish-church was laid in St. Peter's-square on Saturday afternoon. The new premises will include a schoolroom, 62ft. by 30ft., entered from St. Peter's-square, and two class-rooms, each 21ft. by 13ft. The style is Early Gothic; the walls are of pressed brick, with stone dressings, a carved panel representing the Good Shepherd occupying a prominent position in the west front. The interior of the mission-room will be of pressed brick, with an open timber roof, and will provide accommodation for 260 worshippers. The architect is Mr. C. R. Chorley, 15, Park-row, Leeds.

Messrs. Robt. Boyle and Son are at present applying their complete system of ventilation and air-pump ventilators to Knowsley Hall, Lord Derby's seat, in Lancashire.

A brass eagle lectern has just been placed in St. Peter's Church, Mansfield. It was manufactured by Messrs. Jones and Willis, of London and Birmingham.

A new telescope-gasholder, having a capacity of 200,000 cubic feet, is about to be erected at the Torquay gas-works, from the plans of Messrs. Willey and Co., gas-engineers, Exeter.

Mr. Marsh, clerk of works at the Cumberland County Industrial School, was last week elected surveyor to the local board of Cockermouth, at a salary of £80 a year.

The Plumstead surveyorship is vacant by the retirement of Mr. F. F. Thorne, of Lee. We understand that the local committee, to whom the matter is referred, will recommend the appointment of a gentleman at £200 a year, to include his whole services, and that applications will be received up to June 4. An advertisement will probably appear in this paper next week, giving particulars.

A fine art exhibition is to be opened at Plymouth, in St. Andrew's Hall, and a temporary building adjoining, 100ft. by 40ft., on Monday next. The entries have been very numerous, the catalogue extending to 100 pages.

Intercommunication.

QUESTIONS.

[6504.]—**Strength of Cement Concrete Beams, &c.**—Do any correct data exist for estimating the transverse strength of cement concrete beams or slabs, in the same way as the strength of iron or wood beams may be calculated?—N. C.

[6505.]—**Sanitary.**—I have a cast-iron external soil-pipe fixed in a chase. At the top end of this is a lead elbow which connects a P-trap of w.c. I wish to ventilate the soil-pipe by connecting a zinc pipe to the lead elbow, which zinc pipe I propose carrying up above the roof. I should be glad to hear from some of your able correspondents whether zinc is a metal suitable for the purpose—*i.e.*, will it withstand the sewer-gas for a reasonable time?—R.

[6506.]—**Seventeenth-Century Work.**—What name would correctly apply to a country house built between the years 1662 and 1670? Is it too late to be called Jacobean, or would Stuart be the better term? And what would be the chief characteristics of a house erected at that period by a rich Cavalier? I have consulted Fergusson, Stevenson, Roger Smith, and Sir E. Beckett, and they all skip from Queen Elizabeth (Haddon Hall, Wollaton, &c.) to Sir Christopher Wren and the Classical revival in the 18th century, leaving conjecture to fill the gap. The names of any manor-house or houses erected during the reign of Charles II. would be welcome. Would their characteristics be very unlike those of Elizabeth or James I.—of Holland House for example? And were the interior arrangements like those of Elizabeth's time, when the chief feature was the great hall, with its daïs, minstrels' gallery, and carved screen, and the living rooms and chief saloons were not on the ground-floor, but at the head of a flight of stairs, or was the hall as now, merely a secondary feature, with the sitting-rooms symmetrically disposed to right and left of it, and on the ground-floor? And was the quadrangle or ⊏ shape still prevalent, or were houses built in a simple square? An answer to these queries would greatly oblige—A STUDENT.

[6507.]—**The Midland Station Roof, St. Pancras.**—Any information as to the cost of this will be highly appreciated by—EMBRYO ENGINEER.

[6508.]—**Preserving Half-Timber Work.**—I am just about to erect some half-timber gables, and want the timber a dull black, without the gloss that black paint would have. I should be glad if any of your readers can give me a recipe for the above that would both preserve the timber and give the effect I require?—LUSCUS.

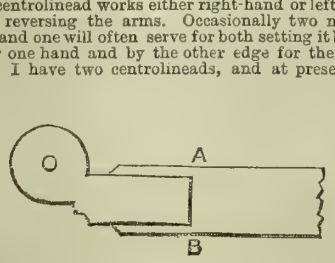
[6509.]—**Wood Floors.**—Writer would be pleased to know, through the replies of your valuable paper, as to which is considered the best kind (and sizes) of solid wood block floor for ground floor of school buildings; also best mode of laying same. Also to know the best mode of constructing wood floor of one pair floor school, so as to be sound-proof.—T. R.

[6510.]—**Interest on Contract Sums.**—If a builder undertakes a very large contract on a schedule of prices, payment to be made on the certificate of the surveyor, and is kept out of large sums of money for several months at a time in consequence of the works not having been measured up, can he claim the interest, representing in this case, say, £4,000 at 5 per cent., from his client, or is the surveyor liable? The fees are paid half by the builder and half by client. The builder has frequently complained to client of the hardship of being underpaid, and the client has remonstrated with surveyor from time to time about delay in measuring up for certificates.—SCOT.

REPLIES.

[6462.]—**Floor 40ft. Span.**—One of your correspondents in "Intercommunication" asks how to construct a room 40ft. wide, 70ft. long, without columns, and with bedrooms and trussed roof above. I suppose the space below the room is divided in some way so that he can get supports for girders to carry the floor, and the floor above, with the partitions, could be very well carried by making the roof trusses of extra strength, and hanging floor partitions and all from them by means of iron rods carried down between the studs. This is a common construction with us.—YANKEE, Boston, U.S.A.

[6475.]—**Advantages of Centrolineads.**—"W. M." is mistaken when he says "Hugh McLachlan has evidently never used a centrolinead," though he might be right in the latter part of his reply. If he is right, I should feel obliged with further explanations from himself and others. "T. D." and "W. M." agree that a centrolinead works either right hand or left by reversing the arms. "E. C. T.," on the other hand, says "every centrolinead works either right-hand or left-hand without reversing the arms. Occasionally two may be needed, and one will often serve for both setting it by one edge for one hand and by the other edge for the other hand." I have two centrolineads, and at present use



one for vanishing points on the right hand and the other for those on the left. It is certainly the simplest to my way of thinking. Have given a little time to experimenting to see if I could work the results mentioned by "T. D.," "W. M.," and "E. C. T.," but at present without success. Supposing the arms can be reversed, I believe the brass threads of the screws must be either injured or, perchance, will not fit, the holes and slots not corresponding exactly enough when altered from their first position; you may also so reverse the arms or the instrument that the drawing edges are not in their proper place. Possibly I have not learnt how to reverse the arms to work properly on both hands; if so, would like the explanation how it is done with diagram. "E. C. T." is plainer when he says "one" centrolinead "will often serve for both setting it by one edge for one hand, and by the other for the other hand." I find it is so, but the lines drawn by the edge *b* are slightly inaccurate, as they are only parallel with those approaching the vanishing-point; this can be found by experiment, the error is there although slight, and the further off the vanishing-point the less the error, so that often it might be passed over. It is also a waste of time to alter one centrolinead every now and then to suit various vanishing-points. What I know of the centrolinead at present is derived from experience only, I can only make one work properly on both hands by working one of those upside down. The Editor is kind enough to allow us the "Intercommunication" columns to assist one another and often to criticise and discuss the question so that the truth is elicited; if I am still wrong I am ready to learn what is right should anyone be kind enough to show myself and others who may be ignorant. It is pleasing to see by the discussions in the replies of these columns how much interest is now taken in them compared with a few years ago, when the replies were very few in number.—HUGH MCLACHLAN.

[6481.]—**Brick Stains.**—The stains mentioned by "J. H. H." are to be seen not only in brickwork, but also stonework. I believe there is nothing better than to leave time to work its own remedy. The stains appear to be caused by the drying of good stone lime mortar, the water drawing out with it an efflorescence resembling that caused by the salt in sea-sand when used in mortar. Possibly it is the same chemical production in both cases, and, as I have never seen it in bad brickwork when the mortar is made of river or pit-sand, look upon it as a good sign rather than otherwise. Many hold that stronger work is obtained by using sea instead of river or pit-sand; but when sea-sand is used the stains are likely to reappear continually, notwithstanding washing of the sand. I should say in the case of "J. H. H." leave it alone, the stain is a sign of good work, and will in the course of a year or so disappear.—HUGH MCLACHLAN.

[6482.]—**Building Construction.**—There are several works on this subject. Tarn's "Science of Building" is a theoretical work of first-class character, it goes, however, a little more into mathematics than the preface would lead you to suppose. I, however, question whether construction can be properly understood without. Davidson's small work on "Building Construction," published by Cassell, Petter, and Galpin, is not to be recommended. Dobson's "Art of Building," in Weale's series, is a good work, for practical knowledge about the best I know of, though sometimes a little faulty in theory. Dempsey's "Builder's Guide" has also good practical information, it is larger than the others, with plenty of cuts, at parts behind the age. Other works on the subject have been brought out by Sir Edmund Beckett and George Robson, these I have not studied.—HUGH MCLACHLAN.

[6487.]—**Valuations of Property.**—"Young Valuer's" want is one generally experienced by all young surveyors. The fact is, there is no book published giving the information required. Tarbuck's little treatise on "House Property" may be consulted, but, as a rule, surveyors have to pick up the routine of report-making in the office. Each valuer has usually his own forms, and there is no rule to follow in the framing of reports, further than that they should be clearly and concisely worded.—G. H. G.

[6489.]—**Examinations in Building Line and Architecture.**—"Builder and Architect" had better make up his mind which of these businesses he is desirous of following. He cannot well do both, as they are distinct occupations. If he goes in for architecture, he had better write for the particulars and syllabus of the examination established by the Institute of British Architects, and devote himself to the studies required.—G. H. G.

[6489.]—**Examination in Building Line and Architecture.**—"W. M." need not be so hard on the querist who styles himself "Builder and Architect." To hurt the feelings of anyone is uncharitable, and "W. M." does not answer in any way the query put, therefore he might have kept quiet. I believe that until this century the business of builder and architect have been combined in the same individual, even in this some most important works have been thus carried out, that the old plan has not yet died out in the provinces whence I suppose querist is and also that in some European countries it still remains without any division whatever. On the other hand I do not think there is any man of note in Britain who combines what are now known as two separate businesses, though some noted architects have commenced their business-life in a builder's workshop or office, and at the present time there is hanging an application for Associateship in the meeting-room of the R.I.B.A., the candidate having spent many of his first years with builders, and afterwards with a quantity surveyor before he took to architecture. Indeed, without doubt, this is the best practical training for an architect, and if he has in himself innate art tendencies, by educating these he may become a truly good architect. "Builder and Architect" will not obtain a direct reply to his question, as there are no such examinations; the nearest approach to what he requires are the Government Science Examinations on Building Construction held in all the principal towns in our island; in London there are also the lectures on Architecture and Building Construction in which examinations are held and certificates granted at the University, Burlington-street, the examinations of the R.I.B.A. and the architectural school of the Royal Academy.—HUGH MCLACHLAN.

[6490.]—**Lincolnshire.**—Barton, Croyland, Great Grimsby, Louth, Moulton, Thornton, Whaplode, and Worlabye; also Peterborough and Newark, just over the borders. This does not pretend to be a list of the most important places to be visited, but in all named there is something worthy to be noted. I believe nearly every village in England possesses a church or other object of interest so that no tourist can go far wrong.—HUGH MCLACHLAN.

[6493.]—**Hoop Iron Bond.**—This should be well tarred and sanded before use, the first as a preservative and the second as a key for the mortar. I do not believe

that the tar will keep on permanently unless the bond is well surrounded by the mortar, so that air cannot reach it: if any tar is chipped or wears off in one place, by the action of air and water oxidation will ensue, spread itself between the tar and the iron, splitting off the former and lifting the walls as mentioned in query. On the other hand, if the iron is well tarred and built in or surrounded with good mortar, no oxidation will occur, the mortar after a time being the best preservative. In proof whereof I have seen it stated that "during the repairs at the Tower of London some years ago, some pieces of wrought iron were exhibited that had been built in the masonry four hundred years, and were then as sound and clean as when first forged."—Hugh McLachlan.

[6494.]—**Painting Queen Anne Work.**—For this there is no colour better than white. Olive green may be used for doors.—Hugh McLachlan.

[6495.]—**Vegetation on Stone.**—If the vegetation is thick, a knife or some pointed instrument must be used to remove the bulk. Otherwise a good scrubbing for the whole or to finish, throwing over a pail or so of water to clean off. When the stone has dried, the letters would probably require repainting after which it would be worth while to try a coating or two of Ransome's indurating solutions, the Szerelmey stone solution, or the damp-solution of the Indestructible Paint Co., as used on the Cleopatra needle. I cannot say which is best. The experiment is certainly worth trying to save the tree and tombstone. —Hugh McLachlan.

[6497.]—**Brick Chimney Shaft.**—There should be an outer shaft of sound stock brickwork, also an inner shaft of, say, 40ft. high, lined with fire-brick all up, the lower half to have a lining of fireclay, which would have to be renewed when burnt away.—Hugh McLachlan.

[6511.]—**Lawn-Tennis Ground.**—In making my lawn-tennis ground I find the lines I make with whiting wash out easily with the rain. Will any reader kindly tell me if there is anything I can mix with the whiting so as to make it resist the weather? I have heard of glue and oil, but I want something better.—W. L. T. C.

[6512.]—**Architects' Charges.**—I should like the following questions answered by some of your numerous correspondents:—An architect was commissioned from the North of England to London. The journey there and back occupied two days, and one day professional advice. What would be a reasonable charge? Should he be paid for time wasted in travelling? Again, he prepares two sets of plans with estimates, each quite different in arrangement and on different sites, to cost, the first £1,400, 2nd, £1,650. Also plans for schools, dormitories, and teachers' residences, with estimate for the same institution, to cost £2,075. What would be a fair and reasonable charge to make?—A Constant Reader.

[6498.]—**Cemeteries.**—There is a design for a cemetery chapel proposed to be built at Nottingham by Mr. Maurice B. Adams, illustrated in the Building News of Aug. 3rd, 1877; a small chapel at Clitheroe, by Mr. S. J. Michell, in the Building News of July 11th, 1879; and a cemetery chapel, built in granite, by Mr. Henry Clutton, at Tavistock, is illustrated in the issue of May 21st, 1880, where it is possible there ought to be a porte-cochère, as in the first design mentioned, while it is also desirable where there are likely to be many funerals in the day, that the coffin should have entrance on one side of the chapel, and exit on the other, as in the last-mentioned. In some cemetery chapels the coffins are in an aisle, and quite separated from the mourners by a glass partition.—Quid.

[6493.]—**Cemeteries.**—The following are properly cemetery chapels, and have been published in the Building News:—Biggleswade, J. Ladds and J. M. Hooker, architects, Oct. 9, 1868, no plan. Proposed mortuary chapel, Nottingham church cemetery, M. B. Adams, architect, Aug. 3, 1877. Design for same by R. C. Page, architect, Sept. 28, 1877. Building News Designing Club, Feb. 8, 1878.—Hugh McLachlan.

[6499.]—**Quantity Surveying.**—Your correspondent is right in saying that most books ignore the point of taking off the quantities of stone tracery. It is ignored in Fletcher's "Quantities," in Dobson's "Guide to Measuring and Valuing," and also I believe in Reid's "Young Surveyor's Preceptor." This is a mistake, it rather leads readers to question whether the authors thoroughly understand the subject on which they write. Mr. Leaning's new book I am not yet acquainted with. If "Tyro" can refer to the Building News of April 10th, 1874, he will find a most useful set of rules agreed on by the Manchester Society of Architects for taking out quantities. The following is extracted therefrom:—"Tracery: As this will generally be of a description between the work of an ordinary mason and that of a carver, the most satisfactory way would appear to be to measure one face over all the work as plain work for setting out on, and then number each piece of tracery with its dimensions and reference to the drawings or special marginal sketch for the remainder of the labour, but measuring separately any groove or rebate for the glazing." This rule shows that till the time of framing it, there was no generally-received method for taking out the quantities of stone tracery. In one office where I worked, each traceried window was entered separately in the bill with a reference to its position that it might be compared with the drawings. The cube stonework was then under the heading of each window taken separately for the sills, jambs, mullions, transoms, and tracery, first the material including labour, and then numbering of mitres, &c. I think each window for tracery at any rate should be kept separate, that a marginal sketch should be shown to a scale of at least 4ft. to the inch, showing accurately all the jointing and the stones separately numbered. If the window has more than four lights, the sketch might be to a scale of 8ft. to the inch, and a portion drawn as a specimen to a larger scale. A section sufficient to show all the mouldings, chamfers, hollows, grooves, and rebates should also be given with dimensions. Then take in the detail quantities as separate items, each stone of the dimensions required before working as cube material, one plain face over all, dimensions and thickness of piercing for tracery, circular sawn or chiselled face on extrados, lineal measurement on soffits as circular work sunk and moulded, moulded or chamfered with grooves or rebates as the case may be according to sketch, internal and external mitres to be separately numbered as also cyclets and joggle joints with sinkings and joggles.—Hugh McLachlan.

WATER SUPPLY AND SANITARY MATTERS.

Ipswich.—The town council received last week an important report from the sewerage committee as to the cost of extras in connection with the new main sewer. It was reported that the construction of the main sewer from Portman's-road to the outlet into the river Orwell on the east side of Hog Highland was commenced in January last year, and the entire sewer was now complete, but was not yet in use. The cost of the upper part was increased by £3,825 by the bad bottom of the old tail stream of the Gipping, which had been encased, and by £940 for additional works. The bed of the sewer in the older parts of the town was found to be land which at some remote period was tidal and covered with slob, and difficulties had also arisen on the foreshore from the intersection of unknown tidal drains. The total cost had been for extras proper £5,101 14s.; for additional works £2,293 13s., and further claims by the contractors (Messrs. Pearson) for timber left in the trenches, yet in dispute, £3,766 0s. 6d. At the same meeting a lengthy report was received from Mr. Peter Bruff, the engineer for the sewerage works, as to the requirements for new arterial sewers in connection with this main sewer. He recommended the construction of six sets of arterial relief sewers, at an estimated cost, exclusive of land and supervision, of £10,100, and stated that the most urgent works which ought at once to be carried out would cost about £5,600. It was resolved to carry out two sections, those in the east central district, at once out of current rates, and to apply to the Local Government Board for sanction to borrow £12,500 for the remaining works. The total cost of the main sewer has been about £60,000.

Market Harborough, Great and Little Bowden Local Board.—On Tuesday, the 10th inst., Major Tulloch, R.E., held an inquiry at the Corn Exchange, Market Harborough, relative to the application of the Local Board to borrow £16,000 for works of main sewerage and sewage disposal. The plans, sections, &c., prepared by Mr. E. G. Mawbey, the engineer for the works, were submitted to the Inspector, who, after taking the evidence of Mr. Mawbey and of Mr. J. B. Everard, of Leicester, the consulting engineer, inspected the land proposed to be taken for the disposal area. The system to be adopted is intermittent land filtration. From what transpired there is no doubt that the scheme met the Inspector's warm approval, and that he will recommend that permission be granted to raise the required loan. The district has been exposed to most disastrous floods which, according to the report of the medical officer of health, has severely affected the health of the inhabitants, and it was explained to the Inspector that it was proposed to deal with this separately. The Local Board have had drawings, &c., prepared by Mr. Mawbey for a Floods Prevention scheme, by the improvement of the river Welland through their district, but in consequence of the probable expenses attending the obtaining of a local Act of Parliament, have not decided to proceed with it. It was originally proposed in a report by Mr. Mawbey, to relieve the town from floods by a system of storm-culverts, with an outfall considerably below the lowest part of the district, which is the scheme now designed and submitted to the Local Board. This being explained to Major Tulloch, received his approval; but as the Board had not resolved to borrow the amount necessary, viz., about £1,500, it is postponed for further consideration.

Wantage, Berks.—The Commissioners of Wantage, having been compelled by the action of the Thames Conservancy Board to discontinue after July next the use of the old storm-water drains into the river for the disposal of sewage, have consulted Messrs. Donaldson and Davenhill, of Walsall, who were the engineers for the Reading sewerage works, and have adopted a scheme prepared by that firm. It is a system of sewerage by gravitation, with the exception of a small district, which will need pumping; the sewerage will be separately conveyed, in small sewers, having a special but unpatented joint, designed by Mr. Donaldson, to low-lying land on the bank of the Ock, where it will be deposited in settling-tanks, and afterwards applied by downward filtration to an area of 3½ acres. The estimated cost is £4,450.

LEGAL INTELLIGENCE.

In re George Collis.—(Before Mr. Registrar Murray.)—This was an adjourned meeting for public examination, the bankrupt being described as of the Bell Hotel, Addle-hill, licensed victualler, and lately carrying on the business of a builder at South Kensington and Earl's-court, in partnership with George Stevens. The unsecured debts were stated in the accounts at £5,500, and debts fully secured £30,985; assets, £3,884.—Mr. Wild appeared for the trustee, and said that he was satisfied with the accounts.—The Registrar accordingly allowed the bankrupt to pass his examination.

Our Office Table.

A very interesting collection of works of art and decorative pottery was exhibited last week at the Institute of British Architects' Galleries, on the occasion of the Conference Conversazione, and among the several paintings we noted specially those lent by Mr. William H. Michael, Q.C.; "Autumn Flowers," an exquisite work by Jules Coupel, and a pleasing landscape by Heffner, and a study of a head by Zimmerman. There were also three cases of carved jade, Chinese snuff-boxes, and Japan lacquer-work shown by the same contributor. Mr. G. E. Street, R.A., the new President of the Institute, lent "The Old Manse," by Fredk. Walker, A.R.A., and several characteristic pictures by Mr. E. Burne-Jones. Mr. Hal. Burrow kindly permitted the use of some twelve selected examples of water-colour paintings and engravings from his collection, and also two old suits of armour, swords, guns, &c., of much interest. Following these we remarked Mr. W. Burton's nine water-colours by Cattermole, some popular bits by Vicat Cole, and good specimens of De Wint's fine work. Mr. William de Morgan, of Chelsea, sent three splendid lustre-ware plates, a bowl, and four jars, in the same style, all worthy of their maker's reputation. Sir Frederick Leighton, P.R.A., lent three pictures, some specimens of old Japanese pottery and ancient embroideries. Mr. Val Prinsep, A.R.A., besides his exhibits of Indian and Persian embroidery, showed some brass jars and Chinese bowls. Mr. G. T. Robinson contributed some Hezin plates, and old Japanese pots and jars. He also lent a Japan lacquer music-stand, as well as one case of lacquer-work. Of carpets, rugs, and embroidery, Messrs. Liberty and Co. lent a large collection, and Mr. Colvile Brown, A.R.I.B.A., furnished some Japanese silk pictures, and kakemonos. The Misses Spiers and Welby sent some hand-painted decorative plaques, and Mr. Phené Spiers a very good series of water-colour views from Holland, made last year. His sketches from Brittany and France were equally admired, both for their architectural accuracy and artistic spirit. The same exhibitor lent many things from Japan in the way of ancient pottery, porcelain, and lacquer work. Among the most interesting things in the rooms was a fine series of 40 photographs of the late Mr. William Burges' works, lent by the President of the Architectural Association, Mr. E. C. Lee. Another set of good photographs was lent by Mr. Alfred Marks, of Old London, and Mr. Thomas Cutler, the author of "The Grammar of Japanese Ornament," furnished some telling and interesting cases of Japanese lacquer, embroidery, and pictures. The Duke of Sutherland lent two oil-paintings, and Mr. R. W. Edis, F.S.A., several conspicuous pictures and water-colour drawings.

Professor Newton, C.B., delivered at University College on Friday afternoon his second lecture on "Classic Monuments and Games." The subject was the funeral rites and sepulchral monuments of the Greeks in the Homeric Age, which was defined as that anterior to the establishment of the Olympiads. The lecturer described the funeral of Patrocles, as related in the 23rd book of the "Iliad," and those of Hector and the heroes slain by Clytemnestra, bringing much information as to Classic stories and Egyptian and Oriental rites to illustrate the customs therein described. He expressed the opinion that the several methods of disposal of the dead, of burying in earth or in caves, and of burning or partially burning the bodies, were contemporary so far as we could trace them backwards, and were probably marks of different races. He stated as the results of his explorations of Dr. Schliemann's excavations at Mycænæ his opinion that the remains and ornaments discovered, and modes of burial, were certainly not those of Greeks, although the sites and graves agreed with the description of Pausanias. The mode of burial was diverse from Homer's detailed statements as to the funerals of the Trojan heroes, so that Dr. Schliemann's assumption could not be sustained, if, indeed, Homer's heroes had any other than a legendary existence. In conclusion, Mr. Newton traced the points of similarity between the beehive-like tombs at Mycenæ ("the Treasuries of Atrium"), the Pyramids of Egypt, and the

barrows of our own country, all of which were masonry and mound sepulchres, probably utilised by several races of people. As the authorities of University College have refused admittance to our reporter, we shall be unable to give the remaining six lectures by Professor Newton.

THE Commissioners for the Sydney International Exhibition have given a first award for "First Degree of Merit," with two diplomas and medal, to Mr. John P. Seddon, of No. 1, Queen Anne's-gate, Westminster, for his four architectural drawings sent to the Sydney Exhibition. One of the diplomas was specially for his drawing of the "Interior of the Chapel of St. Peter's Orphanage, Isle of Thanet," built for the Archbishop of Canterbury and Mrs. Tait. (This drawing obtained a medal at the Paris International Exhibition of 1878.) The other diploma was for Mr. Seddon's three drawings of the Interior of Lambeth Palace Chapel, with decorations for the exterior of University College, Aberystwith, and the Screen of Ingham Church, Norfolk. Mr. Seddon informs us that, in reference to remarks that have been made as to the absence of any drawings of his from the Exhibition of the Royal Academy, he, both this year and the year before last, sent a far finer drawing than any of the above-named drawings, but, on each occasion, received a polite note from the Secretary of the Academy that they had been unable to find room for it.

ON Saturday the first ship entered the new dock at Sutton-bridge, on the river Nene. Projected by Mr. G. F. Young, of Sutton-bridge, the scheme has been brought to a successful conclusion in a little over three years, the first sod having been turned by the Marquis of Huntly, chairman of the Dock Company, on New Year's Day, 1878. The work included the excavation of 600,000 cubic yards of soil, and the use of 32,000 cubic yards of cement concrete, one million and a half of bricks, and 150,000 cubic feet of pitch-pine and Memel timber. Each of the four lock-gates has a weight of 35 tons, and a 50 horse-power steam-engine works the Armstrong hydraulic apparatus. The ground for storage is 70 acres in extent, with railway connecting the docks with the Great Northern and Midland Railway Company's lines. The engineers are Messrs. Brunlees and M'Kerrow, Mr. Herbert Neal, C.E., being the resident engineer. The works have been executed by Messrs. Benton and Woodiwiss, of Derby, and carried out under the superintendence of their agent, Mr. Philip Ayres.

THE Midland Counties District of the Association of Municipal and Sanitary Engineers and Surveyors held a meeting at Hanley, last Friday, when the members of the association visited the sewage-works at Trent Hay, and afterwards listened to an able paper paper, read by Mr. Joseph Lobley, A.Memb.Inst.C.E., and borough engineer and surveyor of Hanley, "On the Sewage Works and General Sewerage System of the Borough." In the early part of the day the members of the association assembled at the sewage works, and examined the tanks, pumping-engines, and filtration areas, and Mr. Lobley described the system of intercepting sewers adopted and carried out in connection with the system, and some of the main sewers were also visited. In the afternoon they assembled in the Council Chamber, at the Townhall. Mr. E. Pritchard (of Birmingham, and secretary of the Midland district), in the absence of the president, occupied the chair. At the commencement of the proceedings, Mr. Pritchard was re-elected hon. secretary of the midland district for the ensuing year. Mr. Lobley was then called upon to read his paper.

ON Saturday afternoon the members of St. Paul's Ecclesiological Society visited the church of Great St. Helen's, Bishopgate-street Within, where they were received by the vicar, the Rev. Dr. COX, who described the monuments and chief features, and by Mr. G. H. Birch, who read a paper originally prepared for the London and Middlesex Archæological Society in 1866. The attendance of members was so numerous as to render a perambulation of the church during Dr. Cox's remarks a matter of difficulty.

THE ancient minster of Wimborne in Dorset—a Norman structure—is to be restored. The estimated cost of the whole work required is £3,000, and the transepts alone will cost about half that sum. A committee has been appointed to carry out the work. The repairs to the central tower are to be proceeded with first. It appears that in interfering with the present transepts much care must be observed, inasmuch as the piers which mainly support the central tower were greatly weakened by the widening of the transept arches during the 14th century. Subscriptions for the restoration are being received.

MR. R. J. COLLIER, of Milner's Buildings, 28, Finsbury-pavement, offered to public competition on the 12th inst., at the King's Head, Walham-green, 52 plots of freehold land in the Shorrolds-road, a new road out of the North End-road, close to the Walham Green station. The land was sold on the ten-years system, and the success achieved by Mr. Collier in the other districts of the metropolis was fully maintained on this occasion, the whole of the plots being speedily disposed of for a total of £6,768. We presume owners of land cannot let sentiment stand in the way of profit, though we are at times constrained to wish they would, as we understand this estate occupies the site of the residence where Albert Smith formerly lived. At the same time and place, Mr. Collier also realised good prices for a few plots of leasehold ground in the Eustace-road.

AN examination for a diploma in sanitary science has been introduced into the scheme adopted by the Senate of the Royal University of Ireland. The diploma will be conferred only on graduates in medicine of the university, and the fee for examination will be £2. The examination will embrace the following subjects:—Climate: A general knowledge of meteorological conditions, the reading and correction of instruments, and tabulating the results of meteorological observations. Chemistry: Constitution of the atmosphere, pure and impure waters, food. Geology: Character and structure of rocks, with reference to water supply and drainage. Physics: Laws of heat, mechanics, pneumatics, hydrostatics, and hydraulics, or sanitary engineering, the construction of dwellings, barracks, hospitals, schools, factories, &c., in accordance with the principles of warming, ventilation, drainage, water supply, &c. Vital statistics: Hygiene, including a practical part on the chemical and microscopical examination of air, water, food, poisonous substances used in manufactures, &c. The examination in physics will embrace the reading of plans, sections, scales, &c., in connection with buildings, sanitary construction, &c.

AN experiment was made in Leeds last Friday with the object of demonstrating the efficiency of Mr. Alfred Walker's new and improved system of constructing railway platforms of concrete, and other works of a similar kind. The trial was made in a yard in Grace-street, West-street, where a section of a platform had been built for the purpose upon the principle adopted by Mr. Walker. The floor is 4in. thick, and rests upon dormer walls placed 3ft. 6in. apart, the material of which the platform is built consisting of iron slag concrete, faced with granite concrete. Mr. Walker claims for his system several advantages. The first being that, as the floor is in a solid block, water runs off the platform on to the line; whereas, in the case of an ordinary platform, the water finds its way through the surface, and by the action of the water and frost the floor sinks below the coping stones, which, thereby, become disconnected from the main work. The platform constructed by Mr. Walker being upon walls, the drains and gas and water-pipes are more easily accessible; moreover, the cells underneath the floor may be used for storage purposes. This system allows of a more rapid construction of a platform, inasmuch as the material soon hardens, whilst in the ordinary method the builders have to suspend work for some time until the foundations have been consolidated. Amongst the gentlemen who witnessed the experiment were Mr. Charles Trubshaw, from the engineers' office of the Midland Railway Company, and Mr. J. B. Fraser, architect, who represented the Great Northern Railway Company. The resisting power of the walls was first tested. A pile of pig iron, weighing 15 tons, was placed upon the platform, which, notwithstanding the heavy weight which it bore, showed no signs of fracture. Subsequently a further quantity of pig iron was placed on the platform, in order to ascertain the pressure per square foot which it was capable of resisting. The floor resisted a pressure of 10cwt. to the square foot, but yielded by the addition of an extra weight. It was stated that if more time had been allowed for the hardening of the platform, it would have stood even a greater pressure. The pressure ordinarily stipulated for a railway platform is 1cwt. to the square foot.

MR. H. SAXON SNELL, F.R.I.B.A., has written a work, entitled "Charitable and Parochial Establishments," which will shortly be published by Messrs. Batsford, 52, High Holborn, London. The book will be illustrated by numerous lithographic plans and views of public schools, hospitals, workhouse buildings, &c., and it will be useful as a book of reference not only to architects but public boards contemplating the erection of this class of building. The St. Marylebone Infirmary, which will be opened next month by His Royal Highness the Prince of Wales, will be very fully illustrated.

18, MOTCOMB STREET,
BELGRAVE SQUARE, S.W.

I find it necessary to warn my Customers that my only Address is as above, and that I have no connection with any house assuming a similar Name.

FREDERICK ARTHUR,
DECORATOR TO HER MAJESTY.

CHIPS.

By a *lapsus calami*, which doubtless every reader detected, the General Conference of Architects was described in the first line of our last issue as the *third* gathering of the kind. Of course it should have been the *sixth*, as stated correctly in the report.

The portion of King's Arms-yard on the eastern side of Moorgate-street, E.C., is about to be continued as a carriage-way into Tokenhouse-yard. The new block of buildings on the south side will cover an area of 14,000 sq. ft., and is about to be erected from the designs of Mr. Bassett Keeling. Messrs. Dove, Brothers, are the contractors.

Mr. J. D. Prior, Her Majesty's inspector of factories for Birmingham and the Midland district, was entertained at dinner on Monday evening, at the "White Horse" Inn, Birmingham, by the members of various trades-unions, to testify their esteem and to welcome him on his appointment.

The memorial-stone of a Church of England Sunday-school was laid at North Heigham, Norwich, on Thursday week. The school will be 60ft. by 25ft., and will cost £500; Mr. J. Youngs, of Dereham-road, Norwich, is the builder.

At a meeting of the Frank Buckland Memorial Committee, held on Wednesday week, it was decided to commission Mr. Warrington Wood to execute a bust.

In our notice of the Colchester Idiots' Asylum competition last week, the name of the successful architect should have been given as R. Frank Vallance, of Mansfield, Notts, not Mr. Valance.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Royal Institute of British Architects. Presentation of royal gold medal; distribution of prizes; "Some Observations on the Mariette Excavations at Sakkara in reference to Discoveries Recently made There," by Prof. Donaldson. 8 p.m.

TUESDAY.—Institution of Civil Engineers. Discussion on "Torpedo Boats and Light Yachts for High Speed Steam Navigation." Paper on the Production of Paraffin and Paraffin Oil," by R. H. Brunton, M.Inst.C.E. 8 p.m.

FRIDAY.—Architectural Association. "The Use of Marble and similar Materials in English Architecture." By T. G. Jackson, M.A. 7.30 p.m.
Royal Institution. "Artificial Production of Indigo." By Prof. H. E. Roscoe. 9 p.m.

SATURDAY.—St. Paul's Ecclesiological Society. Visit to Pinner and Ruislip.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—The Twelfth and Final Ordinary MEETING (Business) of the Session will be held on MONDAY EVENING, the 23rd inst., when the Chair will be taken by G. E. STREET, R.A., President, at 8 o'clock precisely. The Ballot will take place for nine Fellows, seventy-three Associates, one Hon. Associate, and three Hon. and Corr. Members. The Royal Gold Medal will be presented to GEORGE GODWIN, F.R.S., Past Vice-President. The Annual Distribution of Medals and other Prizes will take place. A Communication will afterwards be made to the Meeting by Professor DONALDSON, Past President, entitled, "Some Observations on the Mariette Excavations at Sakkara in Reference to Discoveries recently made there."
J. MACVICAR ANDERSON, Hon. Sec.
WILLIAM H. WHITE, Secretary.
9, Conduit-street, Hanover-square, London, W.

Trade News.

WAGES MOVEMENTS.

MIDDLESBROUGH.—The notices given in by the Tees-side painters a fortnight ago, for an advance of ½d. per hour, expired on Saturday. The result is that a few only of the employers have acceded to the terms asked, the trade not being in a flourishing condition, and in many instances the notices have been withdrawn by the men.

Lamplough's Pyretic Saline is refreshing, most agreeable, and the preventive of FEVERS, BILIOUSNESS, SMALL POX, SKIN DISEASES, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill. *Use no substitute* —[ADVT.]

Holloway's Ointment should be well rubbed upon the pit of the stomach and region of the heart in that particular form of indigestion which gives rise to palpitation, shortness of breath, and a suffocating sensation. Every distressing symptom soon yields, digestion becomes easy, the spirits light, and good health returns.—[ADVT.]

Doulting Freestone and Ham Hill Stone of best quality. Prices, delivered at any part of the United Kingdom, given on application to CHARLES TRASK, Norton-sub-Hamdon, Ilminster, Somerset. —[ADVT.]

McLACHLAN & SONS, 35, St. James's street, S.W. Builders, Decorators, and House Painters. Designs and Estimates. General Repairs and Alterations Executed. Experienced Workmen always in readiness, and sent to any part of the country.—[ADVT.]

BATH STONE.
BOX GROUND,
THE BEST FOR ALL EXTERNAL USE.
CORSHAM DOWN
CANNOT BE SURPASSED IN BEAUTY OF APPEARANCE FOR INTERIOR WORK.
PICTOR & SONS, BOX, WILTS.
(See trade advt. on p. XXVII.) [ADVT.

TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender—it adds to the value of the information.

BEDFORD.—For the erection of two villas in Alexandra-road. Mr. F. T. Mercer, St. Paul's-square, Bedford, architect:—

Foster	£1,190	0	0
Corby and Son	1,093	0	0
Wharton	1,065	0	0
Lilley and Son (accepted)	1,035	0	0

BEDFORD.—For new warehouse in Queen's Head-lane, Bedford, for Mr. J. Carter. Mr. F. T. Mercer, 24, St. Paul's-square, Bedford, architect. Quantities supplied:—

For Excavating, Brickwork, Slating, Carpentry and Joinery, and Masonry:—

Potter, Bedford	£809	0	0
Lilley ,,	771	12	0
Moore ,,	769	0	0
Corby & Son,,	764	0	0
Warton ,,	748	0	0
Harrison ,,	745	0	0
Laughton ,,	730	0	0

For Painting, Plumbing, and Glazing:—

Wootton	£79	8	7

For Ironwork:

Rice and Co., Northampton	£103	10	0
Kilpin and Billson, Bedford	83	17	6
Moulton, Bedford	83	0	0
Baker, Bedford	71	3	10

BRIXTON.—For new rooms at the Angell Town Institution, for Mr. W. Lemare. Mr. J. William Stevens, 6, Southampton-buildings, London, architect:—

Maxwell Bros.	£269	0	0
Gillard	195	0	0
Beale	192	0	0
Holliday	137	0	0
Pack Bros.	125	0	0
Richardson, T. O., Brixton (accepted)	119	0	0

BRENTFORD.—For the construction of the Brentford and Isleworth tramways, with extensions to Hounslow and Twickenham (7 miles in length). Mr. W. Forbes Ashdown, engineer:—

Messrs. Schofield and Co., accepted £42,810 0 0

BROMLEY, KENT.—For the repair of Southland's-grove-road, for the local board:—

Lansbury, T. (accepted)	£235	0	0

BROMLEY, MIDDLESEX.—For painting and distempering works at the Poplar and Stepney Sick Asylum, Devons-road, for the managers. Messrs. A. and C. Harston, 15, Leadenhall-street, E.C., architects:—

Coulson	£997	0	0
Crisp and Tomlin	938	0	0
Wythe	870	0	0
Derby, A. W., Limehouse (accepted)	845	0	0

CHARING CROSS HOSPITAL.—For warming and ventilating, by their new hydro-caloric apparatus, the new Medical Schools at the Charing Cross Hotel. Mr. J. J. Thomson, architect:—

Weeks, J., and Co., Chelsea	£320	0	0

CANNOCK.—For paving bricks for the local board:—Crutchley and Hawkins (accepted) 50s. per 1,000.

CAMDEN-ROAD.—For alterations and repairs to house and studio, 294, Camden-road. Mr. C. E. Evans, architect:—

Perkins, R., (accepted).

CARLISLE.—For the erection of five houses, Victoria-place, for Mr. Jno. Bell. Mr. J. Murchie, architect. Accepted tenders:—

Builder:—

Metcalfe, J.	£1,960	0	0

Joiner:—

Wright, J.	1,040	0	0

Plasterer:—

Ormerod, R.	390	0	0

Plumber:—

Thomson, D. and Sons	240	0	0

Slater:—

Armstrong, D.	163	7	0

Painter and glazier:—

Westray, R.	136	0	0

Ironwork:—

Graham, G.	33	0	0

Bell hanging:—

Hutchinson, J.	43	10	0

Total, £4,005 17s.

CLAPHAM.—For Kenyon House estate, Bedford-road, Clapham:—

For sewers, gulleys, and roads:—

Stubbs, W.	£1,515	0	0
Neal, J.	1,430	0	0
Harris, W.	1,395	0	0
Mayo, R.	1,190	0	0
Mears, J.	1,030	0	0

For drains from sewers to forecourts of 152 houses:—

Stubbs, W.	266	0	0
Neal, J.	245	0	0
Harris, W.	228	0	0
Mayo, R.	190	0	0
Mears, J.	171	0	0

COCKERMOUTH.—For converting premises in Main-street, Cockermouth, into an Italian warehouse and shop, for Mr. Isaac Fletcher. Mr. W. C. Jennings, Cockermouth, architect. Accepted tenders:—

Builders:—Gibson, T. and W., Cockermouth.
Joiner:—Banks, J., Cockermouth.
Plumbing and Smith's work:—Banks, J. B. Cockermouth.
Plasterers:—Benges and Son, Cockermouth.
Painter and Glazier:—Boyd, J., Cockermouth.
Total cost, £134 9s. 0d.

COLCHESTER.—For additions to the East Mills, Colchester, for Messrs. E. Marriage and Son. Mr. E. Burgess, architect:—

Saunders and Son	£1,060	0	0
Dupont	957	0	0
Dobson	945	0	0
Everett and Son	897	10	0

COVENTRY.—For alterations and additions to Stivichall House, near Coventry, for Mr. T. R. Russell. Mr. W. Tominson, A.R.I.B.A., Coventry, architect:—

Hayward, Coventry (accepted)	£734	5	0

COVENTRY.—For stabling for Mr. G. F. Twist. Mr. W. Tomlinson, A.R.I.B.A., Coventry, architect:—

Marriott, Coventry (accepted)	£237	0	0

CRIFTINS-BY-ELLESMERE, SALOP.—For the erection of vicarage house and stabling. Mr. A. Lloyd Oswell, High-street, Shrewsbury, architect:—

Bayley, J., Oswestry	£2,041	0	0
Speake, T., Whitchurch	1,850	0	0
Birsell, W., Shrewsbury	1,795	0	0
Howell, W., Ellesmere	1,780	0	0
Griffiths, J., St. Martin's	1,765	0	0
Bowdler and Co., Shrewsbury*	1,700	0	0
Kesterton, G., Ellesmere	1,640	0	0

*Accepted.

CROYDON.—For the construction of outfall works on the Beddington sewerage farm, for the Croydon local board of health:—

Iles, Wimbledon (accepted)	£1,680	0	0

DARENTH, KENT.—For the erection of two infirmaries in connection with the asylum for imbeciles, for the managers of the Metropolitan Asylum District. Messrs. A. and C. Harston, 15, Leadenhall-street, E.C., architects. Quantities supplied:—

Wall Bros., London	£16,660	0	0
Jones and Co., Gloucester	16,370	0	0
Crockett, London	16,326	0	0
Howell and Son, Bristol	14,995	0	0
Longley, Worth	14,970	0	0
Sawyer, Clapham	14,853	0	0
Braid and Co., Chelsea (accepted)	14,242	0	0

DEARHAM.—For erecting a pair of semi-detached cottages, at Dearham, Cumberland, for Mr. David Bell. W. C. Jennings, Cockermouth, architect. Accepted tenders:—

Builders:—

Gibson, T. and W., Cockermouth	£153	0	0

Carpenter and Joiner:—

Ostle, A., Dearham	75	0	0

Slater:—

Mandle, T., Maryport	30	0	0

Plumbing, Smiths' Work, Painting and Glazing:—

Goodall, G., Maryport	20	15	0

Plastering:—

Burges, E., and Son	20	16	0

Total accetped tenders, £299 11 0.

EAST GRINSTEAD.—For new drains to the workhouse:—

Lynn, G.	£40	10	0
Godly, J.	40	0	0
Beard, G.	33	10	0
Martin, H. (accepted)	24	17	0

EXMOUTH.—For putting the whole of the docks and jetty in thorough repair:—

Redway, Son and Carter (accepted).

FOREST GATE.—For the erection of two villas for Mr J. M. Goldie. Messrs. A. and C. Harston, 15, Leadenhall-street, E.C., architects. Quantities supplied:—

Crockett	£2,400	0	0
Harris and Wardrop	2,346	0	0
Killby	2,322	0	0
Johnson, J. H.	2,275	0	0
Hearle	2,153	0	0
Nicholls	2,100	0	0
Shurmur, Lower Clapton (accepted)	2,070	0	0

GREAT PARNDON.—For alterations, Passmoore, Great Parndon. Messrs. Gordon and Lowther, 1, Guildhall-chambers, architects:—

Brown, Great Parndon	£1,352	0	0
Nicholls, Harlow	1,232	0	0
Dye, London	1,108	0	0
Taylor and Parfitt, London	1,089	0	0
Sirtwell, W., Harlow (withdrawn)	859	0	0

HALTWHISTLE.—Accepted tenders for the erection of Wesleyan chapel, at Haltwhistle:—

Masonry:—Waugh.
Joinery:—Hymers.
Slating:—Nanson.
Plastering:—Heslop.
Plumbing:—Taylor.
Painting:—Canning.
Ironwork:—Snowdon.

HAMPSTEAD.—For four semi-detached villas to be erected at Hampstead. Mr. Henry S. Legg, of Christ's Hospital, architect. Quantities by Messrs. Linsdell and Gifford:—

	Buildings.	Joiners' Work.	Total.
Ashby Bros.	£12,860	£4,759	£17,619
Higgs and Hill	12,640	4,740	17,380
Patman and Fotheringham	12,436	4,790	17,226
Brass	12 397	4,810	17,207
Burford	12,197	4,830	17,027
Croaker	12,347	4,630	16,977
Macy and Co.	12,515	4,442	16,957
Morter	12,216	4,710	16,926
Kirk and Randall	12,193	4,717	16,910
Manley	11,885	4,580	16,465
Perry and Co.	11,342	4,000	15,342
Lawrence	11,486	3,805	15,291
Sage	—	5,900	—

HOLLOWAY.—For repairs at 162, Junction-road, Upper Holloway, for H. Stanley Smith, 8, Staple Inn, W.C. Mr. W. F. Potter, architect:—

Butler, G. W., Holloway	£65	0	0
Dawes, F., Peckham	58	0	0
Hart, H., Somer's Town	57	15	0
Rainbow, W., Somer's Town	55	0	0
Hayworth, S., Kingsland	52	10	0
Hersee, F., Peckham	49	10	0
Dearing, C., and Son, Islington*	45	16	0

*Accepted.

HOLLY PARK, CROUCH HILL, N.—For two semi-detached houses for Edward Preston Willins, A.R.I.B.A., 39, Woodstock-road, Bedford Park:—

Hitchcock, Gipsy-hill, S.E., contractor (accepted).

INVERURIE.—For the building of a Masonic lodge in High-street, for St. Anthony's Lodge of Freemasons. Accepted tenders:—

Masonry:—Gall and Walker, Aberdeen.
Carpentry:—Allan, W., Inverurie.
Slating:—Milne, W., Inverurie.
Plastering:—Gordon, J. S., Inverurie.
Glazing:—Ritchie, J. C., Inverurie.
Plumbing:—Laing, J., Inverurie.
Ironwork:—Rae, W., Inverurie.
Total amount, £450.

KENTISH TOWN.—For the erection of dwelling-houses in Kentish Town, for J. M. Birch Esq. Mr. Albt. Jno. Bolton, architect:—

Gould and Brand	£9,575	0	0
Goodman	8,800	0	0
Heath	8,800	0	0
MacFarlane	8,780	0	0
Beale	8,772	0	0
Holloway	8,432	0	0
White	8,359	0	0
Rickens and Mount	8,048	0	0
Ward and Lamble	7,979	0	0
Henry and Wallace	7,800	0	0
Drake	6,120	0	0

KENNINGTON.—For painting, &c., at Licensed Victuallers' Schools, Kennington-lane, S.E. Mr. H. J. Newton, 27, Great George-street, Westminster, architect:—

Shurmur	£535	0	0
Godden	495	0	0
Keade	429	0	0
Lambel	415	0	0
Cade	400	0	0
Pickersgill	371	0	0
Walker	337	0	0
Crabtree	240	0	0
Cook	236	0	0
Young and Co.	228	8	0
Vears and Co. (accepted)	219	0	0

KENNINGTON.—For repairs to houses in Princes-road, Kennington-cross, for the executors of the late Mr. John Cairn. Mr. W. F. Potter, architect:—

Norton, J., Kennington	£148	0	0
Hersee, F., Peckham	147	5	0
Cook, B., Farringdon-street (accepted)	145	0	0

LIMEHOUSE.—For furniture, Limehouse New Town Hall. Messrs. A. and C. Harston, 15, Leadenhall-street, E.C., architects:—

Jenkins, Stepney (accepted)	£503	14	8

LLANDINABO, ROSS, HEREFORDSHIRE.—For new aisle and part restoration of church. Mr. A. Lloyd Oswell, Hight-street, Shrewsbury, architect:—

Court, J., Llanwarne (accepted)	£601	0	0

LONDON.—For the new Sunday-school and lecture-hall at the Congregational Church, East Hill, Wandsworth. Mr. E. W. Mountford, Chandos Chambers, Buckingham-street, Strand, architect. Quantities by Mr. E. Crutchloe, 3A, Poets' Corner, Westminster:—

Ronald	£2,239	0	0
Adamson and Sons	2,098	0	0
Dove Brothers	2,075	0	0
Gregory	2,073	0	0
Robinson	2,012	0	0
Belham and Co. (accepted)	1,995	0	0

LONDON, W.—For whitewashing and colouring the infirmary of the guardians of St. George's, Hanover-square:—

Tyford, G.	£1,647	10	0
Simmons Bros.	825	0	0
Johnson and Co.	496	10	0
Hancock and Hunt	479	0	0
Wall Bros.	393	0	0
Moore, J.	300	0	0
Sharman, J. and Son	292	18	0

Leeds.—For additions and alterations to *Leeds Express* office. Mr. James Wilson, junr., 15, East Parade, architect:—

Excavating, Bricklayer, and Mason:—

Plows	£986 0 0
Howson	822 0 0
Miers	800 0 0
Gibson	795 0 0
Turner	782 0 0
Thackroy	692 0 0
Hannam and Baite	680 10 5
Tetley	669 9 0
Smith	658 10 0
Roberts and Watson (accepted)	646 0 0
Hirst	625 0 0

Joiner and Carpenter:—

Pearson	345 10 0
Pearse	305 11 0
Thorpe, J. H.	299 15 0
Mawson	298 0 0
Ward	280 0 0
Ellison	275 10 0
Ledgard	271 10 0
Hart	259 10 0
Pearson (accepted)	250 0 0
Stephenson (too late)	217 9 0

Brick and Joiner-work:—

Nicholson and Son	1,200 0 0
Hart	872 0 0

Plasterers:—

Lester	62 6 0
Pearson	54 18 0
Branton	54 9 0
Holdsworth	54 8 9
Sugden	53 16 0
Child	53 15 0
Orange	53 0 0
Knowles	50 0 0
Dakin	50 0 0
Miller	49 15 0
Hemingway	49 8 0
Marsden	48 18 0
Haddock	48 0 0
Lovell	48 0 0
Pranington and Watson (accepted)	45 10 0

Plumber and Glazier:—

Braithwate (if with their cisterns)	80 10 0
Braithwate	74 0 0
Bedford	70 0 0
Young and Fawcett	68 10 0
Webster	67 10 0
Dams	66 12 0
Storey	61 0 0
Woffenden	57 0 0
Greenwood	53 0 9
Atkinson	53 0 0
Fox (accepted)	52 0 0

Painter:—

Dixon	33 0 0
Wood and Son	19 10 0
Gough	13 0 0
Fenton (accepted)	11 16 0

Slaters:—

Wormald	29 10 0
Worsnop (accepted)	21 10 0

Ironwork:—

Crabtree	92 1 6
Nelson	87 10 0
Begshaw	70 0 0
Oldroyd (accepted)	68 5 6

Total accepted tenders, £1,095 1s. 6d.

London.—For rebuilding premises, No. 8, Bell-yard, Fleet-street, E.C., for Messrs Maxwell and Son. Messrs. Isaacs and Florence, architects. Quantities supplied by Mr. L. C. Riddett:—

Kirk and Randall	£2,079 0 0
Smith and Co.	2,010 0 0
Patman and Fotheringham	1,985 0 0
Boyce	1,939 0 0
Conder	1,888 0 0
Stimpson and Co.	1,840 0 0
Scrivener and Co. (accepted)	1,687 0 0

London.—For repairs to Licensed Victuallers' Asylum, Old Kent-road. Mr. W. F. Potter, architect:—

Danks, A. Peckham	£485 0 0
Herring, F., Peckham	448 0 0
Mallett Brothers, Horselydown	413 0 0
Ford, T., Clapham	362 0 0
Cook, B., Farringdon-street	255 0 9
Sayer, R., Camberwell	247 5 7
Butler, G. W., Holloway	232 0 0
Dearing, C., and Son, Islington	220 0 0
Hersee, F., Peckham	198 15 0
Hayworth, S., Kingsland	178 0 0
Wythe, W., Dalston	167 0 0
Wells, W., Paddington (accepted)	160 0 0

London.—For rebuilding No. 4 & 4a, Kennington-road, and alterations to Hercules Tavern, adjoining. Messrs. C. J. and C. H. Shoppee, architects:—

Braid and Co.	£2,775 0 0
Tarrant and Son	2,625 0 0
Gill	2,578 0 0
Langmead and Way	2,497 0 0
Burman (accepted)	2,399 0 0

Maidstone.—For the drainage of Albion-place, for the local board:—

Carter (accepted)	£84 10 0

(Lowest tender from J. Davis, for £61, withdrawn after acceptance.)

Manchester.—For the erection of Wesleyan Chapel, Radcliffe. Mr. A. W. Smith, Manchester and Liverpool, architect. Quantities by the architect:—

Brown. H., Hollinwood	£5,349 0 0
Harrison, W. W., Greenheys	4,910 0 0
Herd, J., Ardwick	4,685 0 0
McFarlane, J., Manchester	4,620 0 0
Cordingly & Stopford, Manchester	4,618 0 0
Holt, W., Manchester	4,570 0 0
Allen, J., Radcliffe (accepted)	4,500 0 0
Haughton, A., Hyde	4,465 0 0
Butters and Carson, Cheetham	4,450 0 0
Williams and Hope, Glossop	4,360 0 0

Mitcham.—For the erection of an infirmary, water-tower, workshops, and various alterations and additions to Mitcham Schools, for the guardians of the Holborn Union:—

Hook and Oldrey	£12,605 0 0
Mowlem and Co.	12,600 0 0
Toms, E.	12,381 0 0
Manley	12,235 0 0
Crockett	11,973 0 0
Wall Bros. (accepted)	11,825 0 0

Nunhead Green.—Metropolitan Beer and Wine Merchants' Asylum, Nunhead Green, for proposed erection of first portion of north wing containing 39,945 cubic feet. Mr. W. F. Potter, architect. Quantities prepared by Mr. C. R. Griffiths, 7, William's-terrace, Chiswick:—

Dearing, C., and Son, Islington	£1,266 0 0
Nicholls, A., Leytonstone	1,134 0 0
Pritchard, W. H., Tooley-street	1,092 0 0
Hayworth, S., Islington	1,045 0 0
Cass and Beldan, Peckham	995 0 0
Dawes, F., Peckham	950 0 0
Hersee, F., Peckham	928 0 0
Green, Jesse, Peckham	895 0 0
Heather and Laws, Peckham	865 0 0

Oxford.—For the Cattle Market, Oxford. Mr. F. Codd, architect and city surveyor, Oxford. Quantities by Mr. G. Shirley, Oxford. (Accepted tenders denoted by *):—

		Buildings.	Stone Paving.	Tar or Asphalte.	Cattle Pens.	Sheep Pens.
Dover, J., Oxford	£929 / £326	£1,255	£675	£392	£995	£1,306
Horn, J., Oxford	816 / 409	1,225	—	—	850	—
Jones, T., Oxford	840 / 315	1,155	730	425	1,125	1,771
Jones, G., Oxford	820 / 330	1,150	660	405	720	1,900
Selby, T., Oxford	823 / 315	1,138	518	406	955	1,539
Howell and Son, Bristol	761 / 312	1,073*	1,109	418	1,020	1,356
Messenger and Co., Loughborough	606 / 502	1,108	—	—	828	1,056
Dewitt, J., Harbury, Leamington		—	516	385*	668*	1,025
Snow, W., Oxford		—	407	501	—	—
Stroud, J., Oxford		—	367	—	—	—
Boon, W., Coventry		—	288*	—	—	—
Taylor, C., Headington, Oxford		—	—	—	819	—
Gray, M., Oxford		—	—	—	748	—
Lucy and Co., Oxford		—	—	—	820	1,110
Hill and Smith, Brierley Hill, Staffordshire		—	—	—	786	783
Bagshaw and Son, Batley, near Leeds		—	—	—	—	1,180
Deane and Son, Oxford		—	—	—	—	715

Plumstead.—For the laying of 84 new crossings in Kentish ragstone, and 10 granite-paved crossings, for the Plumstead district board of works:—

Mowlem and Co.	£1,026 0 0
Lovedale, C. (accepted)	796 0 0

Plumstead.—For the erection of a music-hall in rear of the Windsor Castle Tavern, Maxey-road, Plumstead, for Mr. H. Gigney. Mr. J. O. Cook, William-street, Woolwich, architect:—

Clarke, Plumstead	£890 0 0
Harris, Woolwich	850 0 0
Coombs, Plumstead	800 0 0
Impey, London	620 0 0
White, S., Peckham (accepted)	595 0 0

Plumstead.—For the erection of two villas in Upper Whitworth-road, Plumstead, for Mr. J. Clifford. Mr. J. O. Cook, William-street, Woolwich, architect:—

Sharpe and Everard, Bow	£1,238 0 0
Coombs, Plumstead	760 0 0

Preston, Kent.—For the erection of new board schools for 530 children, two residences, boundary-walls, and necessary offices at Preston-next-Faversham, for the Preston W. D. School Board. Mr. B. Adkins, architect:—

Killby, A., London	£5,573 0 0
Wilson, H. B., Canterbury	5,399 0 0
Perry and Co., London	5,125 0 0
Stiff, P., Dover	4,987 0 0
Jones, D. C. and Co., Gloucester	4,915 0 0
Paramor and Sons, Margate	4,860 0 0
Ware, J. and Son, Faversham	4,812 13 6
Callund and Son, Rochester	4,775 0 0
Cornelius, T., Whitstable	4,599 0 0
Bingham, J., Headcorn	4,567 0 0
Shrubsole, L., Faversham	4,549 0 0
Matthews, A., Dover	4,516 0 0
Cephas Foad, Whitstable	4,498 0 0
Judges, W., Boughton	4,462 10 0
Naylar and Son, Rochester	4,353 0 0
Seager, J., Borden	4,250 0 0
Whiting, R. M. & H., Ospringe*	4,100 0 0
Fetherstone & Lucas, Littlebourne	4,060 10 0

* Messrs. R. M. and H. Whiting's tender was accepted subject to the approval of the Educational Department.

Regent's Park.—For alterations and additions to Walmer Lodge, 71, Avenue-road, Regent's Park. Mr. Fredk. R. W. Muncey, architect. Quantities by Mr. Joseph Robson:—

Atkins	£334 0 0
Hearle and Son	328 0 0
Thomas and Butland	308 0 0

Richmond, Surrey.—Revised tenders on reduced scheme for the proposed swimming-baths, for the select vestry. Messrs. G. Elkington and Son, architects:—

Osborn, J. J.	£5,317 0 0
Allwood, J.	5,255 0 0
Sweet and Loder	5,176 0 0
Beal, W. J.	4,992 0 0
Priestley (accepted)	4,960 0 0

Scarborough.—For new house at Scalby, near Scarborough, for Mr. John Edward Ellis. Mr. E. Burgess, architect. Quantities by Mr. W. Thornicraft:—

Barry, J.	£8,612 0 0
Mansfield, G.	8,443 0 0
Thorpe, J. H.	8,429 10 0
Foster, J.	8,317 15 0
Bland, J.	8,000 0 0
Pitch and Fox	7,517 2 0
Padbury, J. and Son	7,397 0 0

Sheffield.—For erection of villa residence, &c., for Mr. Jno. Vessey. Mr. J. P. Earle, Sheffield, architect. Quantities by the architect:—

Hardwick and Burton	£1,001 0 0
Hollingsworth, G. (accepted)	933 10 0
Rathbone, J.	915 0 0

Shepherd's Bush.—For the erection of stabling, &c., for the London General Omnibus Co., at Uxbridge-road, Shepherd's Bush. Mr. Alfred Josh, architect:—

Crabb	£3,600 0 0
Julian	3,430 0 0
Haynes	3,250 0 0
Richardson, J. O.	3,049 0 0
Ward and Lamble	3,033 0 0
Gentry	2,990 0 0
Richeirs and Mount	2,921 0 0
Beale	2,848 0 0

Shortlands.—For the construction of the Shortlands section of sewerage, Kent:—

Walker, H., Upper Holloway	£7,780 18 10
Botterill, W. J., Cannon-st., E.C.	6,245 19 4
Simmons, J., Sidcup	6,127 9 8
Woodham, W. J., Penge	6,074 1 9
Hill Bros., Beckenham	5,969 4 4
Nowell and Robson, Kensington	5,594 6 1
Neave, J. W., Lewisham	5,547 12 6
Rayner, G., Bootle, Liverpool	5,188 2 5
Dyer, J., Camberwell	5,038 17 7
Woodham, Catford	4,949 0 0
Potter, H., Clapton	4,779 18 2
Nicholson, K., Chelmsford	4,655 16 7
Killingback, C., Camden Town	4,620 15 2
Harris, W., Camberwell	4,603 12 2
Bingham, J., Headcorn	4,550 12 3
Brooker, H., Beckenham	4,328 9 4
Stevenson, G., Chesterfield	4,157 17 11
Dickson, J., Sevenoaks	4,138 7 6

St. Leonard's-on-Sea.—The Eversfield Estate. Roads and drains at Silverhill. Messrs. Fowler and Hill, surveyors:—

Dibby, Hastings	£900 0 0
Hare, St. Leonard's	819 0 0
Cruttenden, St. Leonard's	798 0 0
Stubberfield and Verrell, Hollington	705 0 0
Jenkins, St. Leonard's	695 0 0
Beadle Bros., Erith	695 0 0
King, Hollington	550 0 0

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King	344	16	0
Grinstead (accepted)	314	0	0

TOTTENHAM.—For the construction of roads and sewers on the Seven Sisters Station Estate, in the parish of Tottenham. Messrs. Tunley and Boyle, 14, Clements-lane, Lombard-street, E.C., surveyors —

Bath and Blackmore (accepted) ...	£825	0	0

TOTTENHAM.—For construction of roads and sewers on the Clapham Park Estate, Cavendish-road, Clapham, for Messrs. Tunley and Boyle, 14, Clement's-lane, Lombard-streeet, E C , surveyors.—

Jackson	£499	0	0
Ford and Co.	443	0	0
Harris	430	0	0
Lyons	410	0	0
Bath and Blackmore (accepted) ...	380	0	0

WOOLWICH.—For alterations to the Anglesea Arms public-house, New-road, Woolwich, for Mr. A. Penfold. Mr. J. O. Cook, 24, William-street, Woolwich, architect :—

For general builders' work :—			
Johnson, Woolwich	£219	0	0
Fenn, Woolwich	212	0	0
For cabinet and bar-fittings :—			
Taylor, J. W., Camberwell (accepted)	230	0	0
For pewterers' work :—			
Grimes, J., London	97	10	0
Helling, W., London	72	10	0
Waine, H. T., London (accepted) ...	60	0	0

WOOLWICH.—For new closets and urinals at the National School, King-street, Woolwich, for the Hon. and Rev. A. Anson and the school committee. Mr. J. O. Cook, William-street, Woolwich, architect :—

Johnson, Woolwich	£146	0	0
Fenn, Woolwich	138	0	0

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THE BUILDING NEWS.

LONDON, FRIDAY, MAY 27, 1881.

SHOULD SECULAR AND ECCLESIASTICAL ARCHITECTURE BE THE SAME?

HE must be a very accomplished architect who has not something to learn from Mr. Street's Royal Academy Lectures,—the last of which, for this course, was reported in the BUILDING NEWS of May 6th. The breadth of the lecturer's views, and the fairness and reasonableness of his conclusions, are almost as striking as his thorough and minute acquaintance with every detail which bears on his subject: and it is impossible not to wish that Mr. Street could have given us such a dictionary of the Gothic Architecture of England as Viollet-le-Duc did of that of France. A few words, however, at the conclusion of the last lecture seem to embody an opinion which may easily be misinterpreted; and which, when acted on without the qualifications which Mr. Street's wide knowledge would instinctively suggest, may do, and has done, a great deal of mischief. He is speaking of the domestic architecture belonging to such an abbey as Fountains. "The more one sees of it, the more," says Mr. Street, "does one discover that in those good days there was no such distinction between domestic architecture and ecclesiastical as has sometimes been supposed to exist. The same details that were applied to one were thought suitable to the other; it was the best construction and the most suitable arrangement, the most beautiful proportion, the most delicate moulding of stonework, the truest system of carving of foliage that were everywhere seen, whether the work to be done was for a house or a church, for a monastery or a castle." It is as advocates, and not of opponents, of everything in the Gothic system which can possibly be adapted to the wants of the present day, that we have to make a few remarks on Mr. Street's statement, and on the advice which it is apparently meant to suggest.

First, then, it would seem that ecclesiastical and domestic architecture were most alike in the earliest times, while thenceforward there was a progressive divergence between them. We are far from denying that the art of the earlier times was the best; but it is quite a separate question whether the divergence in later times was wise or foolish. To us, the progressive divergence seems to have run closely parallel with the progressive increase in the number and kinds of secular buildings which were needed. In very early times, the church, the castle, and the monastery were almost the only permanent edifices of importance. They were not so different that the same class of construction could not easily be adapted to each of them; and where the same construction was used, the same style naturally followed. In later ages, unfortified mansions, detached dwelling-houses, and secular buildings of all sorts increased faster and faster; they did not require, and did not as a rule receive, the same class of construction as churches, castles and monasteries, and the construction differing, the style rightly and truthfully came to differ also. The remarkable point is, that with all the marked differences between the civil and ecclesiastical, or more accurately, between the monumental and the ordinary buildings of the later Gothic times, there also existed between them a harmony equally striking. A 15th-century half-timbered house, and a 15th-century vaulted chapel, are far enough apart in their materials, their forms, and their decoration, and yet the two put side by side, only set off each other's beauty by contrast. How to produce this harmony once more is the lost secret for which we can never look too earnestly. The divergence in modern times is wider than ever, and this is no more than ought to be expected from the hundredfold increase in the purposes for which buildings are now needed; but the harmony is gone. Our true course is not to apply church-architecture to buildings of all sorts and sizes, from railway-sheds to cottages; but, while treating churches, railway-sheds, cottages and everything else on the various principles best suited to each, to bring them all into perfect artistic harmony with each other.

Is it certain, again, that, even in early times, the practice of treating ecclesiastical and civil buildings alike, or nearly alike, was quite satisfactory? The church-building of the 13th and 14th centuries was admirable, and as near perfection as anything we can imagine; but did the house-building of the same period, as far as we can judge from the little that remains, anywhere approach the same perfection? We should be strongly inclined to deny it. The very fact of its being so nearly like church-building, argues against it; the house-type of architecture had hardly begun to be differentiated as yet. Men had hardly begun to think what a house should be or could be, they had hardly begun to realise the special possibilities of house design, or to invent its characteristic beauties. Few people can get suddenly out of the groove in which they have been travelling all their lives, or give up in a moment all the tastes and habits and modes of working which have become parts of themselves, and invent off-hand the set of of new tastes and habits and modes of working which are appropriate to some new and untried field of labour. The early church-builders could not easily get out of their groove when they had to build a house; and we may see here and there that the later house-builders could not easily get out of *their* groove either, when they had to build a church. There are plenty of churches, for instance, with square-headed windows, just as there are plenty of houses with pointed ones. But this is not a thing for admiration; it is simply a proof, as far as it goes, of want of versatility; a sign that even able men may get into the way of doing their work and making their designs automatically rather than rationally. And in modern times, also, when we see a church-building architect putting some secular building into ecclesiastical Gothic, or a house-building architect experimenting on churches in a purely domestic style, we feel that neither the one nor the other is doing what is likely to be permanently admired. The beauty of the ornament may at first popularise the one, and the novelty of the caprice may, for a time, captivate some people with the other; but these examples of misapplied treatment will not, in the long run, raise their authors' reputations. A typical church and a typical house, to say nothing of other secular buildings, require very different kinds of design and construction, and if, as we believe, the ornament should follow naturally from the design and construction, they require very different types of ornament also. The same details that are applied to the one are not, generally speaking, suitable to the other; and if, as Mr. Street, no doubt truly, says, they were thought suitable in the Early Gothic period, this is partly because the secular buildings he speaks of were really constructed in a church-like fashion, and partly because the architects of that time had scarcely begun to think out the innumerable problems which secular architecture presents.

It is no longer possible, in the overwhelming majority of cases, to construct our everyday buildings in a monumental way. Ecclesiastical Gothic is an architecture sprung from, and fitted for, buildings of a monumental class—buildings arched and buttressed at the least, and, whenever they approach perfection, vaulted also. As long as domestic buildings were arched and buttressed, and vaulted here and there in parts, a slightly modified Ecclesiastical Gothic was a very natural style for them. But, when the internal arching and vaulting are gone, and the external buttressing, as far as its structural use is concerned, has gone also, is it consistent, or even defensible, to insist on retaining minor features that are only appropriate to arched and vaulted buildings? With the whole internal anatomy of Early Gothic houses abandoned, is it really wise or even honest to try and keep their external shape? This is what the question about ecclesiastical housebuilding really comes to. We have given up, and must, perforce, give up, Ecclesiastical Gothic inside our houses: are we, or are we not, to give it up on the outside also? If we can build our secular works on the same principles on which the early monks built theirs, by all means let us decorate them on the same principles; but if, as everybody knows, we cannot, then, by all means let us decorate them on different principles. Let us accept the facts, and adopt a decoration which conforms to the facts, and expresses the facts, and not build houses of which the elevations belie the sections, and in which the interior is made a jumble, that the exterior may be made a falsehood.

All this, in a quiet unspoken way, has been impressing itself, since the dawn of the Gothic revival, on the minds of thousands of people who have no special knowledge of architecture. Decoration may dazzle for a time, but, in the end, the world approves of what is natural and sincere. So it happens that, on the whole, Modern Gothic in churches stands criticism, and that, on the whole, Modern Gothic in houses does not. The one is instinctively felt to be a reality, and the other to be a sham. The reason is, that what we may call Church Gothic has, in the majority of cases, been applied to both. It has been applied to both because theorists and *doctrinaires* insisted on it. Nothing but Church Gothic, they told us, was Gothic at all. Gothic depended on pointed cross-vaults and buttresses, and must have pointed windows and pointed doors, and all the details which, in high-class buildings, go with them. If it had not these, it was not Gothic. What's in a name? Everything, apparently, to the passing generation of architects. Overawed by the terrible sentence which took away the name of "Gothic" from nine-tenths of the best secular work of the Middle Ages, this whole generation, with few exceptions, renounced the study of the proscribed examples. Their secular buildings should be real Gothic, on the outside at any rate, though so many secular buildings in the Middle Ages failed to be so. They would be more Mediæval than the Mediæval builders themselves. So we have seen Church Gothic everywhere, till the best of detail has grown wearisome by repetition, and till the world, overdosed at last with unrealities, seems ready to go to the other extreme and to turn its back on Gothic altogether. This is what we have come to, through eloquence and art criticism, through theories and dogmas, and through unwise inferences from such facts as those which Mr. Street brings forward about Fountains Abbey. The reaction from Church Gothic everywhere has brought us to debased Classic everywhere; and the same want of judgment which has inflicted on us so many houses in an Ecclesiastical style, is now ready to inflict on us, if it can get the chance, an equal number of churches in a Domestic style. People feel that churches and houses ought somehow to har-

monise. For thirty years or more they have sought to make them do so by repeating church details, slightly modified, in house-fronts. At last they feel this to be absurd and unreal; and the next effort, of which we may already see traces, will doubtless be to make them harmonise by repeating house details in church fronts. This seems to be the impending folly, which, like the rest, will have its day and cease to be. The Gothic revival gave us an ecclesiastical architecture, but helped to destroy our civil and domestic architecture. The Debased Classic revival may improve our civil and domestic architecture, but threatens at the same time to destroy our ecclesiastical one. It would seem as if we cannot have good churches and good houses together. Why is this?

The reason why, is that this remarkable age regulates its art work not by its eyes, but by its ears. Former ages saw for themselves what would do and what would not do, and acted accordingly. The present age is too idle or too diffident to see; it does what it is told, if the telling is only sufficiently eloquent or sufficiently noisy. Who the teller is, does not much matter; he may be a great literary man, or he may be only the "Right Honourable Tony Lumpkin." If he only speaks loudly enough and persuasively enough, some people, and perhaps many people, are sure to obey him. Amongst these speakers, then, who, with better luck than Canute, have driven the tide of architecture upwards and downwards at their will, it has been a common article of faith that nothing but Church Gothic is really Gothic at all. That there was a Mediæval architecture for straight-floored buildings as well as for vaulted buildings, an architecture of stone lintels as well as of stone arches, an architecture of timber as well as an architecture of masonry, they scarcely deign to recognise. For the credit of the Middle Ages, they seem to say, Let us keep all this out of sight as much as possible. We cannot explain it by our little formula about the cross-vault and the pointed arch: the facts about civil and domestic architecture do not agree with our theory on the origin of Gothic, and, therefore, there really ought never to have been any such facts at all. Thirty years ago these eloquent teachers explained that as all Gothic must have pointed arches, houses must have them just as much as churches. The result of thirty years' conformity to their teaching being now a failure visible to all men, they countermand their orders with the same cheerful confidence with which they first issued them. They still tell us that all Gothic must have pointed arches; but having found that pointed arches are apt to look absurd in a dwelling-house, they now assure us that Debased Classic is the only style fit for our adoption. So much for theories, for fixed ideas, and architectural pedantry; so much for letting other people lead us by the ears, instead of walking each man by the help of such eyes as he has. Our eyes would have shown us—and may still show us, if we take the trouble to use them—plenty of Mediæval buildings, not of Church Gothic, and yet in perfect harmony with Gothic churches; not monumental in style, and yet grouping exquisitely with the monumental buildings beside them; not discordant, and yet not unreal. We may see, in short, amongst the later Mediæval works, and even amongst some of the earlier ones, the beginnings of a secular style which might have been, and might still be, developed further and applied to a multitude of modern uses. Our secular buildings might then be in harmony, though not in unison, with our religious ones; but the possibility of harmony without unison hardly seems as yet to have dawned upon the minds of our instructors. If we had not happened to take a passage of Mr. Street's for the text of these remarks, it would be perfectly unnecessary to add that the class of instructors referred to differ as widely as possible from that keen observer and thoroughly practical artist.

WORKS OF ART APPLIED TO FURNITURE.

An exhibition of works of art, including furniture, opened last Monday at the Royal Albert Hall, in connection with the Fine Arts Exhibition which we noticed last week. The Society of Arts have mainly promoted it, for the purpose of encouraging design and workmanship as applied to furniture, and they intend to resume the practice of awarding medals to the artists engaged on such work. The present exhibition surpasses in excellence of design the previous displays of furniture we have noticed here, and there is one feature in the collection which makes it of more value as a test of progress in artistic manufacture. The works are not "show specimens," an element in exhibitions of this kind of which we have lately had too much, but represent the ordinary productions turned out by the firms which send them. Lately, some manufacturers have kept on stock a number of articles which were originally made "to order" for international exhibitions, and many of these objects are known not to have been the productions of the houses which show them. A kind of fictitious and very unhealthy competition has thus been brought about, injurious to modern manufactures of all sorts. A small select display of works such as that now on view at South Kensington will probably help to bring this kind of false advertising into disrepute among our high-class manufacturers. The arrangement of the articles in bays, instead of the promiscuous arena of a large hall, secures also, to our minds, the equally important object of isolation of each firm's articles, so that the style of design and the colour shown in one bay does not detract from the work of another artist, as is often the case in exhibitions.

Messrs. J. G. Crace and Son, of Wigmore-street, occupy the first bay of the small part of the gallery devoted to these works; and the general style of the objects is that of the Renaissance. The large cabinet of carved walnut-wood, designed by this firm, is an elaborate example of the Italian 15th century work, the dark wood being relieved by blue enamel medallions or panels with figure-subjects. Another cabinet of satinwood, inlaid with purple-wood in an 18th-century style; a rich embroidered velvet arm-chair in Early French Renaissance; a fireplace with tiles, and a very handsome Venetian mirror are a few of the exhibits. The tiles in the fireplace are tawdry in colour, and do not harmonise with the woodwork. Beautiful specimens of Minton and Co.'s china, and some stained glass of excellent manufacture, by Heaton, Butler and Co., are shown as accessories to the furniture of this firm. It is noticeable that Italian Cinquecento, and the English Classical taste of the 18th century predominate, and very few exhibitors show work of Queen Anne or Jacobean character. Messrs. Morant, Boyd, and Blandford, of New Bond-street, have a display of works in these styles. One of the best things is the wall decoration of side of room, in the late 18th-century English style. The panels of silk, of a light delicate grey tint relieved by gilding, and an oval mirror, are quiet and in good taste, and the frieze and cornice are not overdone. We notice also, some well-made marqueterie work in a cabinet and writing-table, some chairs covered with embossed velvet, and other articles in the Italian style. The gold lustre ware, by William de Morgan, of Chelsea, and the brocaded silk screen are attractive.

Bay No. 3, of Messrs. Jackson and Graham, of Oxford-street, might represent a model interior on a small scale of a *salon* or drawing-room of the period of Louis XVI. It is filled up in the unique style of that polished age, with the most costly inlaid cabinets of Oriental Greek character. To the architect the quietly-designed chimney-piece in rosewood with inlays of ivory and mother-o'-pearl, and the walls and ceilings in the style of the Louis-Seize period are especially worth attention for their simplicity and quiet taste. The satin wall-hangings, and the canvas-plaster cornice round the bay, are carried out in a harmonious key of delicate tints. We cannot leave this bay without remarking on a few choice cabinets. One of these, in an Oriental Greek style, has inlays of boxwood, ivory, pear, ebony, and other woods, and the ornamentation chiefly consists of conventionalised patterns, especially the honeysuckle ornament, the front being divided into three compartments by pilasters. The colours are in good harmony, though the large honeysuckle in the pediment at the apex looks out of scale. This cabinet is estimated to be worth £2,000; and a chimney-piece in the same style, chastely inlaid with similar woods, is estimated even at a larger sum. The jambs are relieved by fluted pilasters, and a honeysuckle frieze enriches the mantel. The elaborate and exquisite workmanship of these objects, it would be impossible to overrate; there is no carving, but the whole effect is produced by the contrast of well-selected coloured inlays flatly treated—an effect equal to painted ornamentation, though more permanent and beautiful by reason of the highly-polished surface. Another very elegantly-made cabinet, exceedingly simple in its lines of framing, is shown in American walnut, and a small hanging cabinet as illustrated in Mr. Edis's Book on Decoration deserves notice. The Chippendale vitrine or cabinet is unique, and the visitor will find elaborate bronze gilt clock and candlesticks of Italian Renaissance character, some specimens of Japanese lacquer, a dog-grate by Feetham and Co., and a gasalier in ormolu and cut glass by Messrs. Osler. Bay No. 4, is furnished by Messrs. Gillow and Co., of Oxford-street, and presents a striking contrast in tone to the last. The wall-hangings are of dark green velvet with embroidered borders, which, and the plush curtains of the mantel-piece, have been executed by the School of Art Needlework, Sloane-street. We more especially notice some rich Oriental curtains from Messrs. Vincent, Robinson and Co.; a pair of beautifully painted vases in the Italian style with figure medallions and coiled-snake handles by Messrs. Minton; a massive and handsome walnut secretaire; a satinwood cabinet made for the Empress of Russia; a walnut vestibule seat, with pendentive hood, enriched by Ionic shaftlets in Renaissance, and an ebony and ivory table. Some beautifully chased metal work, by Messrs. Elkington and Co., are exhibited as accessories to the furniture, and enhance the value of this collection. The fireplace is recessed, and the mantel, in dark maroon plush, embroidered, with the stove and irons, has a very rich effect. A needlework panel for screen, having a figure of a lady, on a gold ground, is an excellent imitation.

Messrs. Holland and Sons, of Mount-street, Grosvenor-square, have a more select number of works. The Gothic side-board or dressoir in oak, relieved by inlays and gilding, is a conspicuous article of furniture, and is particularly interesting as being from a design by the late Mr. B. J. Talbert. We certainly consider this design one of the best of that artist's works; it illustrates the best points of the style Mr. Talbert delighted to work in. It is free from the lumpiness and unmeaning detail

which followers of this school of decorative woodwork have reproduced to such an extent as to throw discredit upon the style. The upper compartments, with the canopy and the panels emblematic of fish, fruit, and game, and the brass metalwork, are well proportioned and in strict harmony with the purpose. An ebony cabinet, designed and carved in a massive Italian Renaissance style by Barbetti is also exhibited by this well-known firm. The wall-hangings are dark, of 17th-century taste. A dado of tapestry is surmounted by plush of a dark peacock green or bluish-green shade, which sets off the oak furniture admirably.

Messrs. Howard and Sons, of Berners-street, have attempted a more modern style of decoration; the painted flock-paper and the rather heavy coved, painted ceiling quarrel somewhat with the specimens of excellently manufactured cabinet-work and Keramics exhibited, and less pronounced mouldings and colours in the ceiling would have been an improvement. Eighteenth-century wall-decoration, generally known as the style introduced by the Brothers Adam, may be noticed in Bay 7, furnished by Messrs. Wright and Mansfield, of New Bond-street. A mahogany door, surrounded by architraves and cornice, with trusses, and some small satinwood sideboards, inlaid in of the same chaste style, will be noticed for their refined ornamentation and colouring. A very elaborately inlaid pianoforte-case, after the style of Louis XV., in which tulip and kingwood are largely introduced, will be admired, certainly more for the beauty and delicacy of the workmanship than for the design, which suffers from a lack of refinement. The specimens of carving and gilding are interesting examples of 18th-century decoration. Bay No. 8 has been fitted up in a very tasteful manner by Messrs. Collinson and Lock, of Fleet-street, and the cabinets and other objects indicate that approach to decorative moderation and consistency which this firm has generally displayed. We may especially draw attention to a massive mahogany chimney-piece in the Renaissance style, but with decidedly Spanish feeling in the detail and carving in the mantel, and a few other specimens of rosewood and inlaid furniture.

Messrs. Gregory and Co., Regent-street, exhibit a very choice collection in solid rosewood and Turkoman tapestries; the curtains are of good design and colour; Messrs. Shoolbred and Co., a variety of oak buffets, cabinets, &c., relieved by ebony mouldings in the Old English Jacobean styles. Over-panelling appears to be the chief fault in these and the elaborate piano case. The last bay is filled up by Messrs. Johnstone, Jeanes, and Co., in the Italian and 17th-century styles of decoration. The carved walnut buffet and panelling with tapestry-panels, and the excellent parquetry floor, call for attention. The corridor is filled up by Messrs. Doulton and Co. with some interesting specimens of their Lambeth ware, faïence and terra-cotta work. The small relief panels, modelled in terra-cotta by G. Tinworth, are particularly clever; and the admirer of decorative faïence will find much to commend in the painted plaques and panels, and the large tazza in Doulton ware. Mr. Edward Sears shows two panels of stained-glass with figure-studies and some tiles, and the School of Art wood-carving copies of 18th-century work. Mr. F. Jacob has a well-executed, ebony-veneered lady's writing-table, and Mr. J. Aumonier a carved oak pilaster in the style of Italian Renaissance, shows spirit and refinement. We notice in the corridor, besides some decorative panels, a few specimens of wrought-iron work, designed and wrought by S. and C. Phelps in a free style. Nearly every style of modern decoration may be carefully studied in the dozen bays at the Albert Hall, and the architect and students of decorative art may find, in these contributions by some of our leading manufacturers, evidence of a taste which has been gradually supplanting the fashionable crazes of the last few years.

THE WATER QUESTION.—IX.

RAIN is the intermediate condition of the three changes of form of water, from mass to vapour, from vapour to rain, and from rain to mass again. All water upon or in the earth above the sea-level is the produce of the rainfall, and comes chiefly from the ocean, but in general from water surfaces. Water is raised into the atmosphere, being first converted into vapour by the heat-rays of the sun, and as the vapour of water is lighter than air, being about five-eighths of the weight of air, bulk for bulk, and at the same temperature and pressure, it rises and is blown about by the wind, and as it is heat which changes the particles of water on the surface of the ocean and elsewhere into vapour, so it is the loss of heat which changes the vapour into water again. The vapour moving laterally with the wind and rising up against the hill-sides into a colder region, contracts and unites in rain-drops. The vapour itself is invisible; what we see in clouds is partially condensed into water, but not yet into globules of sufficient weight—a sphere increasing in weight as the cube of its diameter—to fall through the resisting medium of air. For what knowledge of the rainfall we possess, of an extensive and systematic kind, we are indebted chiefly to Mr. G. J. Symons, now President of the Meteorological Society, who began in 1858 to collect and arrange the observations which had then been made of the depths of rain fallen in previous years, and to extend the observations, and since 1860 he has published them annually (Stanford, publisher), and now he receives records of the rainfall from about 2,000 stations, all over the country.

The rainfall of this country comes chiefly from the Atlantic ocean with the prevailing westerly and south-westerly winds, and is precipitated in large quantities on the high ground of the chain of hills which range in a generally north and south direction through England. If the rainfall on the western coast be compared with that further inland, it will be seen to increase as these hills are approached. Mr. Bateman drew attention to this in his evidence before the Water Supply Commission, to the effect that if in any particular year the rain on the westerly coast, say, at Liverpool, is 36in., and going right across the country to the east coast, it increases as the range of hills is approached, where it is at the foot, say, 40in., on the summit of the hills it is from 50 to 60in.; further east it is 30in., and further east still it is 20in. In an investigation he had made across England from Liverpool over the Manchester waterworks drainage-ground and over that of Halifax, it was observed that the winds impinge upon the westerly slope of the mountains which form the eastern side of the Rivington (Liverpool) waterworks drainage-ground, where in a certain year the rainfall was 48½in. Over the ridge, in the first trough to the east, are the Bolton waterworks, the trough running pretty nearly north and south; and at Belmont, in the Bolton waterworks district, the rain was 53in. The next trough is the valley from which the Blackburn waterworks are supplied, and there it was 42in.; and over the mountains right down in the east it was 30in. The Manchester waterworks are formed in a mountain range, the Penine chain of hills, lying between Manchester and Sheffield, commonly called the backbone of England. The rain at Manchester in 1859 was 38in., in round numbers. Going eastward, the rain at the Denton reservoir, which is 300ft. above the sea, was 34in.; at Newton it was 35in., and a little further east it was 33in. All these places are upon the plain, or nearly the plain. Then at the foot of the hills the depth of rain was 46½in. Higher up at the head of the valley, on the west side of the hills, it was 53½in., then 57·64in., a little further towards the head, on the east side, just over the summit, it was 58½in. At the reservoir of the Sheffield waterworks, which is on the hills more to the east, it was 46in., at Penistone 39in., and at Sheffield, 25in., showing an increase as the hills are ascended, and, over them, rapidly diminishes towards the east. On the line of the Rochdale canal, which also crosses the backbone of England, in the same way, in another year, the rainfall at Rochdale, which is at the foot of the hills, was 39·7in. At Whiteholme, on the top of the hills, 66·7in.; at Blackstone Edge tollbar, 67·5in.; and, on the east side, 66·6in.; but these last three places are almost entirely upon the summits of hills not more than 1,200ft, high. Then at Sowerby Bridge, which is at the easterly foot, though comparatively in the hills, it was 32·27in., and at Halifax, less than that.

It was observed by Dr. Miller, in the Lake district, that the rainfall increases up to a height of about 2,000ft. above the sea, but decreases on mountains of higher elevation.

If the elevation of the country lies within the region of the rain-clouds, which may be said to extend to about 3,000 or 4,000ft., the greatest portion of deposit within that range takes place at from 700 to 2,000, or 2,300ft. If the greater portion of the gathering-ground lies within that zone, setting aside local circumstances, that will be the elevation which will give the greatest quantity of rain. Supposing a continuous ridge exceeding 2,000ft. high to range north and south, there would be comparatively little rain on the east side; it would stop nearly all the rain-clouds from the west, and the water would be precipitated on the westerly slopes; but, where there is a range of mountains, the summits of which measure upwards of 3,000ft. with depressions in the ridge, the largest amount of rain falls in the valleys to the east of those depressions. These westerly and south-westerly winds prevail over the greater part of England and Wales; but in the North of England, in Northumberland, a westerly wind is a dry wind, and a wet wind on the coast of Northumberland is a dry wind in the West.

The rainfall map of the 6th Report of the Rivers Commission, 1874, shows the average annual fall at various places in most of the river basins. Taking first those on the western coast, which have the heads of the valleys towards the east, the rainfall is seen to increase upwards from the coast as the watersheds are approached, thus,

		Inches.
Mersey basin:	Liverpool	35.
	Manchester	36.
	Marple	36.
	Chapel-in-frith	40.
Ribble basin:	Preston	39.
	Settle	50.
Lune basin:	Lancaster	44.
	Garsdale	52.
Lake district:	Whitehaven	52.
	Kendal	61.

Taking next, from the same records of rainfall, those river-basins in which the heads of the valleys are towards the west, it is seen that in general, but not without exceptions, the depth decreases from the watersheds towards the middle and lower portions of the basins, thus,

		Inches.
Thames basin:	Cirencester	31.
	Oxford	25.
	Greenwich	24.
Severn basin:	Hengoed	36.
	Shrewsbury	27.
	Worcester	28.
Wye basin:	Rhayader	46.
	Hereford	30.
	Ross	27.

		Inches.
Trent basin :	Birmingham	31.
	Derby	26.
	Retford	23.
Calder basin :	Halifax	31.
	Pontefract	25.
Aire basin :	Near the Watershed	35.
	Leeds	23.
Yorks. Ouse basin :	Richmond	31.
	Thirsk	24.
	York	23.
Tyne basin :	Allenheads	50.
	Tynemouth	27.

On the Ordnance Survey "Map of the Rivers and their Catchment Basins," a series of rainfall depths is marked, which, although not the averages, are comparable with each other, and, for this purpose, better so than averages would be. These show the following reductions of depth of rainfall, beginning at the western watersheds and proceeding in an easterly direction.

		Inches.
Thames basin :	Nr. the Watershed	31·8.
	Oxford	27·1.
	Reading	24·8.
	Windsor	23·6.
	Kingston	24·2.
	Croydon	24·2.
	Greenwich	28·5.
	Sheerness	22·5.
Severn basin :	Nr. the Watershed	68·4.
	Shrewsbury	23·5.
	Worcester	23·
	Cheltenham	25·7.
	Gloucester	21·8.
Wye basin :	Rhayader	41·
	Hay	32·7.
	Hereford	28·3.
Trent basin :	Birmingham	31·
	Leicester	27·6.
	Loughborough	26·3.
Derbyshire Wye and Derwent basin :		
	Nr. the Watershed	65·1.
	Cromford	37·3.
	Belper	29·9.
	Derby	29·4.
Don basin :	Nr. the Watershed	54·8.
	Barnsby	27·4.
	Sheffield	32·5.
	Doncaster	33·1.

	Inches.	Inches.	Inches.
Calder basin :	49·7	31·1 and	27·2.
Aire basin :	39	27·7 ,,	24·2.
Wharfe basin :	54·7	30·9 ,,	25·2.
Yorks. Ouse basin :	27	25 ,,	25·5.
Wear basin :	31·3	25·8 ,,	24·2.
Tyne basin :	45·5	28·5 ,,	24·2.

The facts formerly stated, of the much greater quantity of water flowing off the ground per acre of the drainage area in the upper part of a river-basin than in the lower, confirm the inference to be drawn from an examination of the relative depths of water fallen, as stated above; these showing that the greater rainfalls take place on the steeper ground in the immediate neighbourhood of the main watersheds.

To go from yearly rainfalls to excessive falls in one day, which we must do in considering effects in the flood question, and taking the latest published returns, those for the year 1879 (for those of 1880 are not yet published, we believe), there fell at Granchester mill, in Cambridgeshire, on the 2nd of August, 3·92in.; at Cambridge, 3·80in.; at Huntingdon, 3·75in.; at Taunton, in Somersetshire, 3·55in.; at Royston, Herts, 3in. On the 16th August, there fell at St. Asaph, 3·75in.; at Kidderminster, 3.47in.; at Whitchurch, Salop, 3·42in.; and at Penygwryd, Carnarvonshire, 3·n. In the previous year, 1878, there fell on the 15th August at Newport, Mon., 4·24in.; on 10th April, at Haverstock-hill, 3·90in.; on 21st January, at Oughtershaw, Yorks., 3·75in.; on 15th August at Cardiff, 3·65in.; on 9th November, at Aberdare, 3·31in.; on 6th August, at Matlock, Bath, 3·12in. In the previous year, 1877, there fell on 13th September, at Rhiwbrifdir, in Merionethshire, 4·27in.; on the 2nd September, at Barnstaple, 3·80in.; on 15th July, at Bolton, 3·70in.; on 15th April, at Exeter, 3·65in.; on 15th April, at Honiton, 3·34in.; on 19th January, at Beddgelert, 3·34in. In the year 1875, in Monmouthshire and Glamorganshire, the falls in one day, the 15th July, were nearly twice as great as any previously recorded at the respective stations; they were at Newport waterworks, in the hills, 5·33in.; at Newport, 5·30in.; at Tintern Abbey, 5·31in.; at Cardiff, 4·80in; at Caerleon, 4·64in.; and at Chepstow, more than 4·20in.

But we have not yet got to the extreme conditions to be taken into consideration, for while the depths above are fair examples of those which occasionally fall in 24 hours, in some part or other of the country, a greater proportionate fall takes place somewhere every year during short periods of time. In 1879, there fell in London ·27in. in 3½ minutes; at Sheffield, ·31in. in 5 minutes; at Arlington, 1·48in. in 20 minutes at Wisbech, ·64in. in 30 minutes; at South Petherton, ·75in. in 1 hour; at Hythe, 1·53in. in 2½ hours; at Whitchurch, 2·60in. in 3 hours; and at Cambridge, 3·60in. in 4½ hours.

In 1878, ·89in. fell at Caistor in 10 minutes; at Over Darwen, ·68in. in 15 minutes; at Doncaster, 1·25in. in 30 minutes; at Banbury, 1in. in 40 minutes; at Blackburn, 1·39in. in 45 minutes; at Northampton, 1·25in. in 50 minutes; at Cardiff, 1·78in. in 1 hour; at Otterburn, 2·10in. in 1½ hour; at Huntingdon, 2·61in. in 2 hours, and so on; and to go back to 1875, there fell at Exeter 3·26in. in 3 hours; and, in short, Mr. Symons says in the records for 1878 that we know roughly that in every year there is sure to be a fall at several stations of at least ·30in. in 15 minutes; or ·50in. in 30 minutes; or ·60in. in 45 minutes; or ·70in. in 1 hour; or ·80in. in 2 hours. Now, when these heavy rainfalls occur after the ground has become saturated by moderate rains persisting for a long time together, the rivers do not carry off the water, being already bank-full, or nearly so; and here we arrive at the indication of what to do, which is to make reasonable provision for dealing with these in all available situations, to such an extent as may be both practicable and economical; for it would be useless to enter into the consideration of any plan, however feasible in an engineering point of view only, which would not also be economical, on a broad view of the question, and that view comprehends the supply of water, from the stored sources, for domestic use, and for power at a distance. In 1877, an Act was passed for England and Wales and for Ireland, which gives facilities to landowners for the construction of reservoirs and similar works, on the ground that "in many places it would greatly conduce to the affording of a plentiful supply of pure water to the inhabitants of villages and towns, and to the industrial requirements of the locality, if facilities were given to landowners of limited interests to charge their estates with sums expended by them in constructing reservoirs and other works for the supply of water, of a character permanently to increase the value of such estates for other than agricultural purposes," with which Act is incorporated the Waterworks Clauses Act, 1863, with respect to the security of reservoirs, and with which also is incorporated the Improvement of Land Act, 1864, and the supply of water from such stored sources as are mentioned above, to sanitary and other local authorities, and to manufacturers and other persons, is deemed in this Act an improvement of the land within the meaning of the Improvement of Land Act, 1864, if the construction of such works will effect a permanent increase in the value of the land, or produce a greater income, and it would seem to be a very reasonable provision to make in the Floods Prevention Bill that all lands so protected by water-conservancy works should be exempt from taxation in respect of the flooded lands of any river-basin.

THE PURCHASE OF GAS AND WATER WORKS.

It has been practically conceded by every one who knows anything about the working expenses connected with gas works, that the transfer of these works to local authorities has been productive of economical results. Mr. Arthur Silverthorne, C.E., has brought out, as a supplementary work to his recent volume on the "Transfer of Gas Works to Local Authorities" noticed by us at the time, "The Purchase of Gas and Water Works,"* which furnishes valuable statistics of the gas companies, the price of gas, the annuities or purchase money paid upon paid-up capital, and the amount required to pay annuities and interest per 1,000ft. of gas sold. The tables of figures referring to the gas undertakings under local authorities show the great reductions effected in the price of gas since the works have been taken over. The author very justly observes "actual relief from taxation should spring from the increased development of the resources of local undertakings which, previously from inefficient working or other causes, have not contributed to their fullest value." Under municipal management, gas undertaking is capable of making a much larger return than under a company, as much as £17 per cent. in some cases; and the author clearly shows the application of capital will be fourfold: 1st, the integral payment of the original company's interest; 2nd, the reduction in price of gas; 3rd, redemption of capital; and 4th, the balance applied to the relief of local rates. On the other hand, the redemption of capital in the case of companies is not secured, and the gas consumer receives no benefit. In the case of many large towns, like Glasgow and Leeds, the exorbitant prices asked by the companies had been a bar to the acquirement of works, and it was only by applying for a Bill to empower authorities to erect new works, and introduce an independent supply, that the corporations have succeeded in securing transfers on reasonable terms. By the Borough Funds Act, 1872, competing schemes were abandoned, and corporations were powerless to apply funds for these purposes, though urban authorities can, under the Public Health Act, 1875, supply gas under certain conditions, and acquire works situate within their own districts upon agreed terms. Nearly all purchases, says Mr. Silverthorne, since 1872, have been on "terms agreed," or under the voluntary system. Among the extravagant demands made by companies are those for prospective value, back dividends, &c. They generally claim to be entitled to maximum statutory dividends, and are exempted from restrictions which corporations are not exempt from. The author rightly thinks companies ought "not to receive the statutory dividend, but that amount less the sinking fund required to extinguish the annuity say in 60 years." Mr. Silverthorne enters into a number of important considerations for those who contemplate compulsory purchases, and the suggestions offered by him will save many costly failures. Taking a typical case, the author says: "It is perfectly correct to reckon any transfer of efficient works a high-priced purchase in which the purchase money and interest on loan-capital works out higher than *thirteenpence* per 1,000ft. of gas sold."

The section on waterworks is treated in the same practical and masterly manner, the statistics of water undertakings under local management, and of the London water undertakings under the management of local companies, being particularly instructive and useful. We cannot now enter into the recommendations of the author, which appear to be sound and based on correct principles. It is to be hoped those who favoured the arrangement entered into with the London water companies some time ago, will read the remarks here made; and

* The Purchase of Gas and Water Works. By Arthur Silverthorne, Consulting Engineer. London: Crosby Lockwood and Co.

the precedents given of the Cardiff water purchase and that of Derby are significant. On the whole, we can safely say economy would be consulted by the perusal of Mr. Silverthorn's treatise and statistical returns.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE session of the Instiute was brought to a close on Monday evening, by the annual meeting for the presentation of the royal gold medal, and the distribution of prizes. The president, Mr. G. E. Street, R.A., F.S.A., who wore the royal gold medal and the chain of office, took the chair.

The SECRETARY announced the death from consumption, on the 9th inst., of Professor Fredrik Wilhelm Scholander, secretary of the Royal Academy of Fine Arts at Stockholm, and an hon. and corresponding member of the Institute.

THE CHURCH OF ST. MARY OVERIE, SOUTHWARK.

The PRESIDENT mentioned that amongst the new books presented to the library, was Mr. F. T. Dollman's monograph upon the Priory of St. Mary Overie, Southwark, which deserved special notice. Their old colleague, Mr. Francis Dollman, they would remember, was for many years assistant secretary and librarian, and the work just completed represented the crown of years of careful research and study. He had had an opportunity of looking over the book, and could speak highly of its character. Many of the illustrations could not now have been done, as they represented the old nave, now destroyed, and were made from the very careful drawings by Gwilt. The council had also purchased a second copy of the book to be placed in their loan collection.

ELECTION OF MEMBERS.

The following eighty-three gentlemen were then ballotted for and declared duly elected, the former operation occupying three-quarters of an hour. As Fellows (9):—John McKean Brydon, Cambridge-place, Regent's-park, N.W.; William Watkins, Lincoln; Henry Townley Sugden, Buckingham-street, Strand, W.C.; Charles Mant, Major R.E., East India United Service Club, St. James's-square, S.W.; Thomas Henry Eagles, Associate, Coopers'-hill, Staines; Frederick William Waller, Gloucester; Charles Robert Chorley, Leeds; John Wornham Penfold, Associate, Great George-street, Westminster; and Thomas Henry Fleeming, Wolverhampton. As Associates (73):—John Cowell, Canterbury; Arthur Samuel Hewitt, Great Yarmouth; John Payne, Blythwood-road, Crouch-hill, N.; Archibald Gillespie, Blackheath, S.E.; Edward Instone, Addison-road, Kensington, W.; George Pearson, Finsbury-pavement, E.C.; Richard John Lovell, Oakley-road, Canonbury, N.; Andrew Oliver, Queen's-gardens, Bayswater, W.; Joseph Battye, Manchester; Edward John May, Queen Anne's-grove, Bedford-park, W.; Herbert Hardwicke Langston, Great James-street, Bedford-row, W.C.; William Rushworth, Croydon-common; Matthew Reed, Newcastle-on-Tyne; Matthew Henry Holding, Northampton; Donald Campbell Marks, Church-road, Forest-hill, S.E.; George Halford Fellowes Prynne, Adam-street, Adelphi, W.C.; William Allen Coombs, Blenheim-crescent, Notting-hill, W; William Scorer, Lincoln; Arthur Charles Alfred Norman, Mutley, Plymouth; Arthur Harland, Barnet-common, Herts; Thomas Jerram Bailey, Queen's-road, Battersea-park, S.W.; Dominick Joseph Coakley, Cork; Harry May, Menstone, near Leeds; Frederick Moorhouse, Huddersfield; Richard Wood, Leeds; Harry Wilkinson Moore, Oxford; Frederick Henry Appleton Hardcastle, Clyde-street, South Kensington; Charles Aimé, Wool Exchange, Coleman-street, E.C.; Alfred Frampton, Featherstone-buildings, High Holborn; John Medland, Chancery-lane, W.C.; William Muskett Yetts, Finsbury-pavement, E.C.; Walter Bryan Wood, Gloucester; Frederick Montague Grattan, Walthamstow; William Murray, Wood-lane, Shepherd's-bush, W.; Charles William Lovett, Camberwell-road, S.E.; Frederick George Hughes, Birmingham; William Andrew Rolfe, Hill-street, Rutland-gate, S.W.; William Henry Romaine-Walker, Buckingham-street, Adelphi, W.C.; Robert William Collier, Shortlands, Kent; Henry Adair Rawlins, North Finchley; Charles Edward Powell, Chancery-lane, E.C.; William Edward Clifton, East India-avenue, E.C.; Claude Pemberton Leach, Weatherby Gardens, South Kensington; John Samuel Paul, Newington Green-road, N.; Frederick Atkinson Powell, Melbourne-square, Brixton, S.W.; Reginald Theodore Blomfield, B.A.; Manchester-street, W.; Sidney Gambier Parry, Clareville-grove, South Kensington; James Archibald Morris, Ayr; William Neville Ashbee, Dean's-yard, Westminster; Robert Braxton Perriss, Newport, Isle of Wight; Edward Henry Bruton, Cardiff; William Henry Haynes, Great James-street, Bedford-row, W.C.; Charles Marriner, Francis-street, Bedford-square, W.C.; Frederick William Peel, Coleshill-street, Eaton-square, S.W.; Edward William Lockwood, Huddersfield; Herbert Stanley Saunders, Finsbury-circus, E.C.; Martin Luther Saunders, Finsbury-circus, E.C.; William John Point, Buckhurst-hill, Essex; Mark John Lansdell, Theobald's-road, W.C.; Archibald Sempel Anderson, High-street, Camden Town, N.W.; Alfred Hugh Davies-Colley, Manchester; John Brooke, Manchester; Roger Thomas Conder, Wyndham-crescent, Junction-road, N.; Edward Early Hollis, Bartholomew-road, N.W.; John Johnson, Queen Victoria-street, E.C.; Frederick George Knight, Wimbledon; Edward George Stead, Blackpool; Edward Lane Swatman, jun., Hampton Hill, Middlesex; James Webster, Doughty-street, W.C.; Edward Goffee, Finsbury-pavement, E.C.; Clarence Tilt Coggin, South Lambeth-road, S.W.; Samuel Tucker, Argyll-street, W.; and Leonard Chas. Riddett, Bedford-row, W.C. As Honorary Associate (1): Major James Law Lushington Morant, R.E., Palace Gardens-terrace, Kensington. The following gentlemen were elected by acclamation as honorary and corresponding members (3): Baron Henry de Geymüller, Albert Thomas, Government Architect (Grand Prix de Rome), and Olivier Rayet, Professor at the Collège de France, Directeur-Adjoint at the Ecole des Hautes Etudes; all of Paris.

THE ROYAL GOLD MEDAL.

In presenting the royal gold medal to Mr. George Godwin, F.R.S., F.S.A, Past Vice-President, the President delivered the following address:—It is now my duty to perform the act which every year serves to remind us, in the most practical manner possible, of the interest which Her Majesty the Queen deigns to take in the progress of our art. The distinction which Her Majesty bestows to-night through my hands has this peculiarity—characteristic of our national system—that we are first of all consulted as to the person to be honoured, and that Her Majesty, unless she see reason to the contrary, confirms and ratifies our selection. The recipient of the medal which I am now commissioned to deliver, with Her Majesty's approval, is therefore that one among us who by the general vote of his brethren is held to be the most worthy among those still undecorated. Jealous of the honour which is thus accorded, this Institute, with the Queen's sanction, has been in the habit of giving the medal in successive years to an English architect or man of science, an English writer on architecture, and a foreign architect or writer. In this way the number of those who can at any one time hope to hold this distinction is small, and it follows that the award, if it were ever lightly made, or on insufficient or unworthy grounds, would be at once actively and jealously criticised; and we who have received it know that its value to us is thus greatly enhanced. On this occasion I think I may assume that it is because you, Mr. Godwin, have distinguished yourself at least as much with your pen as with your pencil that your name was preferred to that of any of your brethren. This year it is by custom the turn for the literary architect to be decorated, and that I do not think this a custom to be regretted, you will believe when I tell you that when I received the medal myself it was on the same mixed literary and artistic grounds. The work of Mr. Godwin's life, as I need hardly tell anyone in this room, has been the editorship of the earliest and most important of the journals which devote themselves to architecture and its interest and progress. Of this, if I am rightly informed, he has been editor now for some thirty-seven years; and as he began his editorship within a year of the foundation of the journal, we can see how completely he is entitled to all the credit of its subsequent course. We all know that the *Builder* has been conducted with an honest anxiety to improve and popularise the public appreciation of architecture; and I believe I express the simple truth when I say that, in avoiding the pitfall of making it merely a professional organ Mr. Godwin has conferred a distinct benefit upon us. It would have been a real calamity if for all these years it had been our own professional advantage and our own concerns, as distinguished from those of the public, which had been the main object of the editor of such a paper. With a much larger sense of what was really for the good of our art, Mr. Godwin has made his journal one which, whilst it is always ready to devote itself with zeal to architectural questions, never does so to the prejudice of or in forgetfulness of those without whom we should not exist, those who do us the honour to put work into our hands. Among the works for which Mr. Godwin is specially known are those which he has from time to time published on the subject of the crying evils of bad drainage, bad ventilation, and bad building, especially as these affect the condition and happiness of the labouring classes. No more worthy work can be done; and though much—very much—still remains to be done before we can be otherwise than ashamed of our condition in this respect, to Mr. Godwin, as one of the pioneers of progress in such really vital work, no small honour is due. Then, to turn to another branch of his work, I believe that I am not wrong in attributing at least the lion's share of the work done by the Art Union of London to Mr. Godwin. For many years he acted as one of the Honorary Secretaries, and it was mainly, no doubt, to his energy and powers of organisation that the large and lasting success of the Institution has been due. I need not go through the catalogue of publications which we owe to Mr. Godwin, from "The Churches of London," published so long ago as 1838, to his plea for the "Establishment of a National Theatre," published in 1878. They cover a great amount of ground, and deal with a variety of subjects full of interest to most of us. No contrast between new ways and old is greater than that which now leads the architect to become a literary man as well as an artist. In the earlier Mediæval days this was never known. But the invention of printing led naturally to such a change, and the man deserves well of us who has made, as Mr. Godwin has, good use of the opportunities which it affords for the wide dissemination of information and criticism and illustration of our art. Unfortunately, success in one branch of such an architect's work is likely, as a rule, to lead to the execution of less building work than would otherwise have been accomplished, and with all his energy a successful author is likely to suffer in his practice as an architect. I am unable to give you a long list of buildings erected by Mr. Godwin; but his hands have not been unoccupied, and among others St. Mary's Church, West Brompton, and the restoration of the noble church of St. Mary Redcliffe, Bristol, may be taken, I think, as typical examples. And now, Mr. Godwin, without further dwelling upon details which were familiar to the members before they resolved to submit your name to Her Majesty for the bestowal of this medal, I will only say that, though it was first instituted in 1848, it falls on me to give you a decoration which you share with but a small band of living men. Death has been busy in our ranks, and at the present moment you make the ninth Englishman who holds this Royal Gold Medal. I congratulate you on the honour Her Majesty, advised by your brethren, has conferred on you, and I trust you may long be able to continue your labours on behalf of the art and the profession to which all here are equally with yourself, I hope, devoted.

Mr. GODWIN, who was received with loud applause, replied: Mr. President, gentlemen, and colleagues,—It is unnecessary for me to say that I appreciate very highly the honour which has been conferred upon me—an honour which has come direct from her Majesty the Queen, at the instance of the Royal Institute of British Architects. I am particularly indebted to you, sir, for the genial and flattering manner in which you have made mention of my works, and to you, gentlemen, for the very kind and cordial

way in which you have received this announcement. It was my fortune to receive, sir, from the hands of your distinguished predecessor in that chair, Earl de Grey, the very first medal which was given by the Institute. Although it is now many years ago, I can see Lord de Grey, whose portrait hangs before us, as plainly as I can see you now, and I seem to hear his words as plainly as I heard yours. I can remember the flush of pleasure with which, on the next day, I read a most commendatory article in the *Literary Gazette* of that day, written by genial William Jerdan. I am delighted to see that there is at any rate one person here who was present on that occasion, my dear and affectionate friend, Professor Donaldson, who from that time to this has honoured and favoured me with his regard. Of the 131 members who then formed the membership of the Institute, as against the thousand members of to-night, I believe only some six or seven remain amongst us. The President has naturally enough alluded to my connection with the *Builder*. Let me point out that between those two presentations, that for an essay and the royal gold medal of this evening, my whole working life has lain. If it has not been a brilliant one, at any rate, I may assert without contradiction, that it has been one of constant and persevering effort to spread information, to maintain the dignity of the profession, and to aid in advancing the welfare of all classes of society. I am particularly pleased to think that our President should have given his approval to that policy, which led me so to widen the scope of the *Builder* as to interest many besides professional readers. I believe that by taking that course a much larger and more appreciative audience have been reached for architects and architecture than would have otherwise been the case. In this editorship there have been necessarily some mistakes made, and there have been individuals who felt themselves aggrieved; but if you will remember how many opportunities for mistakes occur to an editor every week, and that I have had some 1,900 bundles of such opportunities of falling into errors, I hope I may be forgiven for all my lapses. The President has alluded to certain investigations of mine into the condition of towns; without an assumption of mock modesty, I may say that they were conducted by me for some years at considerable personal sacrifice, and with some personal risk. But if I claim to have been one of the earliest and most persistent pioneers in that course, and if I venture to believe that some of the feeling which now prevails in respect to that inquiry is due to those efforts, I do so because I am desirous to show that the profession of architects had a representative in the very earliest stage of that vitally important movement. I will ask you to bear with me for two or three minutes longer, because I wish to bring before you a matter of deep interest to myself, as I wish to show my appreciation of the great favour and kindness done to me in other than words. We have all been taught that architecture concerns itself with commodity, convenience, and delight—that is, commodity and convenience besides delight. I have a very strong conviction that the architect of the future, unless he is willing to see a large number of buildings pass into the hands of a different set of men, must pay particular attention to the facilities and the wants of modern life, to novelties and improvements in construction, and to all those sanitary arrangements which are necessary, in order to produce a healthful and happy home. To keep this fact obviously before the coming race of architects, and to induce the pursuance of that course, I propose, if the assent of the council be obtained, and if the proposition find favour at your hands to-night, to found, not a scholarship nor a medal, but, by the investment of, say, £1,000, to provide annually a purse of £35 or £40. Adopting an old university term, I would call this a bursary, and it should be available to the recipient who would go abroad for a month or six weeks and examine, study, and report on any new points in planning, any novelties in construction, any improvements in the sanitary arrangements which he may find in the town or city which he should elect to visit. The mode of competing for the bursary I have not yet quite settled; however, as Iago says, with a difference, "I have't; 'tis engendered; Anderson and White must bring this well-meant birth to this world's light." It might be, I think, in some mode connected with the Institute medal, which is given annually for an essay; and so anxious am I to see its results, which I believe will be of the greatest value, that I shall be disposed, if the recipient of the Institute medal of the present year be found a capable person, and willing to accept the obligations imposed on him, to provide the bursary for this year in addition to the investment, so that we might at once begin to receive this information. The difficulty of getting information from abroad is very great, and I have often heard our present energetic secretary complain of the impossibility of inducing foreign members, even after promises made, to send any particulars of their work, so that in that respect considerable advantage might arise from the proposition I am making. The notes would, of course, remain the property of the recipient of the bursary, who would perhaps be expected to provide a paper embodying them to be read before the Institute during the session. As things went on, I think he would publish a book which would be of the greatest value to architects and architecture in England. I beg you not to consider I am throwing any slight or anything like cold water upon the practice of sketching and measuring old buildings, such as is now pursued by members of the Institute and the Academy. Far from it. The pursuit and study of beauty must still be one of the main points with an architect, if he is to be justified in taking the title of artist. I simply wish it to be remembered that there is something more to be borne in mind—that architecture is a science as well as an art, and that the architect of the future must not simply be the apostle of the past, but the good genius of to-day. While I would not say, "Let the dead past bury its dead," I would earnestly take up the next line of the poet and add, "Act, act in the living present." I trust that you will consider that this proposition of mine, if adopted, is likely to be of service not alone to architects but to the general public.

Mr. Charles Barry thought it would not be the wish of the members that Mr. Godwin's noble announcement should pass unnoticed. All details of this scheme, which had come upon him as upon others, as a complete surprise, must be left for consideration by the Council; but he should at least like to propose the following general vote of thanks:—"That this meeting, fully appreciating the importance of the ideas enunciated by Mr. Godwin, entirely agrees with him in the necessity of the architect of the present and the future, being a man of science as well as a man of art; and this meeting, whilst cordially accepting the noble gift he has put forward, and which will naturally for ever bear his name, so long and so deservedly connected with the press and with this Institute."

Mr. Whichcord, ex-President, in seconding the motion, said he entirely concurred in the idea that the scientific as well as the artistic side of the architect's character should be strengthened.

The President, in cordially thanking Mr. Godwin for his unexpected gift, thought the Council would be only too pleased to accept charge of it. He believed no one would misunderstand Mr. Godwin's intention as to the bursary. He did not wish to encourage one aspect of the architect's work at the expense of the other; both were essential and inseparable, but he wished the recipient of his prize rather to have a tendency to study the scientific rather than the artistic side of his art. He then put the motion, which was carried with applause, and added that it had been their custom hitherto to add to their portraits a representation of the form and features of their late President. No president had more fully deserved that honour than the one who had just vacated the chair. If such a movement were set on foot, however, he trusted that subscriptions would be given on a slightly more generous scale than had hitherto been the case, or they would run the risk of covering the walls of the rooms with pictures which were not first-rate. Subscriptions would be received to any amount by the council.

Mr. Whichcord was then formally requested to sit for his portrait, Mr. Charles Barry being appointed treasurer of subscriptions, on the motion of Professor Donaldson and Mr. Dawson.

DISTRIBUTION OF MEDALS AND PRIZES.

The President then presented the medals and prizes to the successful competitors, in accordance with the following list:—Pugin studentship, W. R. Lethaby; Soane Medallion, Roger Thos. Conder; certificate of honour, Charles Alexander; hon. mention, Mark John Lansdell. Tite prize, Robert Wm. Collier; hon. mention. Wm. Tyson Gooch. Grissell medal, Frederic Miller; 2nd, 2 guineas in books, J. H. Curry and Arthur Beresford Pite (æq.); certificate of honour, Herbert Goodall. Institute medal and 5 guineas in books, for drawings, Arthur Percy Gunston. Institute medal and 10 guineas, for essay, Andrew Thomas Taylor; certificates of honour, Frederick Ernest Eales and Thos. A. Hooper.

ROCK TOMBS AT SAKKARA.

Prof. Donaldson read the following notes, illustrated by sections and elevations, of his investigations made on the spot in 1860, of discoveries made by the late Mariette Bey at Sakkara:—An underground tomb, consisting of long galleries and side-chambers, with a sarcophagus in each, had been laid open by M. Mariette, near the great Pyramid of Sakkara, about a quarter of a mile off to the north-west. It is excavated out of the natural rock, which consists of a soft friable grey stone, like indurated clay, with seams of striated or fibrous alabaster, from ½in. to 1in. deep, about 12 or 15in. apart. The roofing is circular in form, but the walls, up to the springing of the arch form, are lined with soft Torah stone in courses 14in. high and 18in. thick. The sepulchral chambers are on each side of the galleries, and measure in the clear, between the masonry, 26ft. 6in. deep from front to rear, by 16ft. wide. Others measured between the rude rock 28ft. 8in. by 12ft. The floor of these lateral chambers was sunk 3ft. lower than the floor of the galleries, and the bottom of the sarcophagus 7ft. 3in. below that. The sarcophagi, of red granite or grey, measured 12ft. 9in. long by 7ft. 8in. wide, with a total height of 11ft.; their thickness averages from 1ft. 1½in. to 1ft. 5in. The body of the sarcophagus measured 7ft. 8in. high; the lid 3ft. 4in., the top splayed off, with a level upper surface 4ft. 10½in. wide. On one I found hieroglyphics, not very deeply incised, but rather thinly marked, almost in lines (as it were) on the outer surface. On another which I examined there was lying on the sarcophagus a rudely carved stone couchant lion, 4ft. 8in. long by 1ft. 8in. high, including the plinth. The main gallery was about 12ft. wide by 8 or 10ft. high, arched and lined as the chambers. I saw about twenty-five of these chambers, but there were still unexplored many hundred lengths of gallery, and I doubt not many are still concealed, encumbered with *débris*, and containing like stupendous sarcophagi. The sarcophagi were of porphyry, grey and rose granite, basalt.

A vote of thanks having been accorded to Professor Donaldson, on the motion of Mr. Ewan Christian, the President formally announced the close of the session, and invited the members to meet again on the first Monday in November.

THE VENTILATION OF PUBLIC BUILDINGS.

So many theories of ventilation have been broached or propounded of late years, that it is rather difficult to keep one's mind posted up with the most reliable or recent facts. Of course, ventilation is a branch of science, entirely dependent on carefully-conducted experiments, while half the theories are based upon ideas only partially verified by actual experience. We have two very opposite views of ventilating buildings: one which supposes the expired air being heavier, ought to be abstracted at the floor level; and the other, that vitiated or exhaled air rises naturally, and should be allowed to escape at the upper part of the room. No doubt, the view that the exhaled air descends arises from a popular error in supposing that the carbonic acid separates and falls to the ground by virtue of its greater weight than that of air; but experiments have proved that such is not the case, for owing to another law, of "diffusion," it mixes with the breath, and is almost immediately absorbed by the air of the room. As much carbonic acid will be consequently found at the top as at the bottom of a room. Temperature affects the rapidity of diffusion; if this gas is colder than air, it will diffuse slowly; if warmer, the diffusion will be more rapid. The exhaled breath always ascends where the ordinary temperature prevails; it becomes diffused as it rises, and this it will do more or less quickly as the temperature of the

room is greater or less. The fresh air for inhalation takes its place from below, the ascending current being induced by the bodily heat of the person inhaling it, influenced by the general temperature and currents in the room. Mr. Robert Briggs, in an elaborate paper read, "On the Ventilation of Halls of Audience," before the American Society of Civil Engineers (see report in the *Transactions*), discusses in a practical manner the subject of ventilation, and he defines ventilation of occupied places as meaning only the supply of air for health and comfort in requisite quantities. What these quantities are varies, of course, with all conditions of life and health, and states of rest or activity in the individual. The experiments of Dr. Edward Smith are referred to as showing that at mean temperature of 60 to 70 per cent. of hygrometry, an adult man, when awake and at rest, may be taken to make 16 respirations of 30 cubic inches, or 480 cubic inches in a minute. In all exhaled air there is a proportion of aqueous vapour: "only 1 7-10th per. cent. in volume of the inhaled air at 70 degrees is vapour, while 5 per cent. of the same volume is exhaled at 20 degrees higher temperature," thus the quantity of vapour increases, and this excess is increased also by the insensible perspiration from the skin. We think it unnecessary to enter into the data furnished by the author, bearing on the quantities of aqueous vapour and carbonic acid gas exhaled, though the remarks made will be found trustworthy. These establish the point that only a little over one-third of a cubic foot of pure air is needed each minute, provided the entire volume of vitiated air be removed without mixture in the same time. In short, 4½ cubic feet of air per minute is considered enough to "remove all vitiated air from personal sources to furnish perfectly fresh pure air for respiration, and to provide an atmosphere 4in. or 5in. thick around a standing individual, which atmosphere will ascend around him, and be supplied from beneath at the rate of motion of about 3ft. or 4ft. per minute." In short, Mr. Briggs very sensibly regards ventilation as consisting mainly of diffusion and dilution; in fact, the room must be regarded as merely an intermixing chamber of sufficient capacity for such purposes, and not a space in which the exact quantity of air to be respired by so many individuals per minute is contained. Without entering into the computation given, or the assumptions made, which depend after all on individual comfort and on observations in rooms where a sense of comfort is maintained for long periods, we may affirm the conclusion that for rooms continuously occupied by persons in health 30 cubic feet of air per person per minute will pleasantly and healthfully ventilate rooms, supposing, of course, proper temperature and humidity, and a cubic capacity of about 1,000ft. per person. This figure will be quite inadequate for hospital wards and many cases of acute disease, while increased temperatures demand larger quantities of air, even after these are satisfied. The problem is, then, What is the quantity of air to be systematically supplied to any hall or room? When a room is to be occupied for a short time only, its cube contents may be taken as so much fresh air, and deducted from the amount required for ventilating the same room for the same time. In audience chambers, the cubic capacity per sitter is estimated at 200 to 300 cubic feet, or only six to ten minutes' supply of air to each person, and where, says the author, the final purity is to correspond to a regular supply of 30 cubic feet per minute. "If this cubic capacity is to be taken in addition to any regular supply for a given length of time, then if 100 minutes be taken as the length of session, 2 to 3 cubic feet of air per minute becomes available as an addition to whatever is supplied." Proceeding to discuss the practical question of introducing and distributing air, the author refers in commendation to Dr. Reid's proposition for perforated flooring. For audience-halls occupied for sessions not exceeding two or three hours' duration, Dr. Reid's value of 10 cubic feet of air per minute is considered all that should be arranged for when planning such halls. The gas-burners must not be overlooked; each consumes about 4½ cubic feet of gas per hour, and requires 2,700 cubic feet of air per hour. The writer goes into a variety of practical rules and details on downward ventilation, and steam heating arrangements, rotary fans, &c., into which we cannot now enter, but which may be very usefully consulted by those interested in the subject.

THE DICTIONARY OF ARCHITECTURE.*

PART XXI. of the "Dictionary of Architecture" has been published, and no doubt subscribers will be glad to receive another contribution towards the completion of this slowly-dragging undertaking. The present part brings the dictionary down to the letter Q, and the members will now be able to bind the work up to that letter. The notice to members states the entire cost of the present part, P to Q, has been about £570, and the balance in hand will, it is thought, be sufficient to carry the work to the end of S. An appeal is also made to each member for a contribution of £2 2s. to enable the committee to carry on the work, excepting those members who have joined since June, 1875. Looking at the performance of the part before us, we meet with many unimportant names that might have been omitted or very much abridged. Of what practical use are such terms as "Pacchacamac," a locality of South America, "Pacchione," Pacherot, Packing Case, and a number of other names of places and persons which probably will never be wanted by the subscribers in their whole lifetime. Many biographical notices are to be found under the letter P, which are, to say the least, rather unnecessary insertions in a dictionary of architecture, while a few other subjects, like Painted-glass, Parget work, Perspective, &c., might have been usefully amplified. The articles, however, exhibit as a rule much learning and careful editing, and every important authority has been quoted which bears upon the subjects. Our own pages among others have been largely quoted throughout the work, and one great value of the Dictionary is that it affords the student a list of authoritative works upon any subject of which he may be searching for information. The article on "Paint" is an important one, and the BUILDING NEWS is referred to several times in the course of the remarks, as on the Adulteration of Paints, by Prof. Cotton, Vol. XIX., and in "The Decoration of Houses," Vol. for 1870. There is also a fairly-written article on "Painting Rooms," though a few good instances are omitted. The editors of the Dictionary have paid especial attention to the etymology of obscure terms, as the term "pane" or "panel" which may mean a compartment, a square of glass, a piece of cloth, and the part of a fence between two posts. One great value of the work is the explanation of the different offices of buildings. Thus take "pantry," formerly the "buttery," now a large closet wherein plate, china, and cooked provisions are kept: a few useful hints are furnished of the proper position of this useful part of a house. We read, "the butler's pantry should be placed as near as possible to the dining-room, for the convenience of service; it should be removed from general traffic, and especially from the back door, for the safety of the plate; the communication with the wine and beer cellars must be ready; it should be near the housekeeper's and steward's rooms." Sometimes a fireproof safe is necessary, and the butler's bedroom should adjoin the pantry; a closet bedstead is sometimes provided in the pantry. "Paper" is the subject of an interesting article in which reference is made to paper roofs used in Russia and England. The paper roof at Witton House, Norfolk, blown down in 1774, and of Tew Lodge, Oxon, are mentioned. These roofs were of sheets of stout paper dipped in a mixture of tar and pitch, and then nailed on like slates. Paper slabs, tiles, water-proofing are mentioned, and Bielefeld's paper-mâché buildings described. An interesting memoir of the late Mr. John Papworth, edited by his son, Mr. Wyatt Papworth, appears. The article on "Parqueterie" is not quite exhaustive enough, and many recent improvements in its manufacture have not been taken account of; "Partition" has been more fully treated, and allusion is made to Claudel's rule for the thickness of wooden partitions; also to partitions of sawn stone slabs, terra-cotta, hollow bricks, and the French partitions filled in with plaster rubble or light stone. An exhaustive article on Pavements, and articles on Peach-house, Pediment, Perpendicular Period, Persian Architecture, Picture Gallery, Pipe, Painted Architecture, &c., will be found. We should have liked in some of these to have had more authoritative opinions expressed; for instance, it would have added to the value of the Dictionary if "Picture-gallery" had been more fully discussed, and the principles of lighting explained with some approach to accuracy. It is hardly sufficient to cite a number of opinions and examples of picture-galleries, though these may be usefully consulted. On referring to a dictionary, the reader naturally expects to find at least a summarised view, or a definition of the correct principles involved. We think also the term "picturesque" should have been defined, though the bibliography on the subject added is useful enough. Plasterer's Work and Decorative Plastering are more fully treated, though a few illustrations and some notice of the recent revival would have been acceptable additions. Plate-iron Beam and Girder-bridge are inadequately explained, though copious references are made to our own and other articles; we look also for some details of plumbing under "Plumbery," but the word "plumber" only is given. The reader will find the subject treated in subdivisions, such as under the names, "Lead," "Flat," "Gutter." The present article is confined to the historical facts relating to the craft, and to references to books and journals. It is quite necessary in a dictionary to break up the subjects as much as possible, and to define the chief subdivisions or terms, rather than to give an exhaustive article to the general subject embracing all details. This method of defining terms as they occur under their respective heads is more generally useful, and has been adopted by the editors of this Dictionary. For example, "Pointed Architecture" is a large topic; but here we have only a very general summary of dates and authorities given, the student being referred to each period and to various details for more particular information under their various letters. Under "Polychromy" also little information is given, except a list of works. The processes are described under "Distemper," "Encaustic," "Fresco." We find a valuable summary of particulars relating to the preservation of materials, in which this journal is frequently referred to. The word "quantities" is briefly defined by references made. The present part worthily maintains the comprehensiveness and general accuracy of the former portion; and the value of the work is chiefly in the bibliographical references, which are very copious.

* Part XXI., P.—Q, with title page and table of contents. London: Architectural Publication Society, 9, Conduit-street, W.

EUSTON STATION HOTEL.

TRAVELLERS to or from Euston Station must have recently noticed an extensive building, of considerable frontage, facing the station entrance, and obscuring the colossal Doric portal to the terminus. The new building connects the Euston and Victoria hotels, which latter now form the east and west wings of an enlarged hotel, and the central portion of it spans two roadways leading to the station, one intended as an entrance, and the other as the exit, and these have each a footway for pedestrians. The façade towards Euston-road is entirely of Portland stone, and is designed in the Italian style, though the entrances and fenestration are treated to harmonise with the severer buildings in connection with it. The Company's architect, Mr. Stansby, limited by the existing levels, has, nevertheless, considerably departed from the commonplace elevations of the old buildings, and has imparted a freshness and variety to the new front, though retaining a dignified balance in the composition. One of the chief features is the wide double entrance, formed by four rows of fluted cast-iron columns of the Doric order, which serve to support the girders carrying the interior walls and superstructure. On each side of these openings are the wings of the new façade, and these are carried up and surmounted with pediments, adorned with carving in the tympana. The central portion of the superstructure over the roadways has been well broken up by an alternation of rusticated and ashlar facing, and is relieved also by three bay-windows, which are corbelled below and rise through the main stories. Crowning the centre of the façade is a low clock-tower, with pediment. Corinthian pilasters relieve the wings, supporting a richly-carved frieze and cornice, surmounted by an attic with carved panelled pilasters above.

The interior comprises in all 222 sitting and bed-rooms. Important alterations have been made in the basement, and a vaulted corridor,

partly lighted by a patent illuminator, connects the two wings. The kitchen and larder (models of cleanliness) are lined with white glazed Minton tiles, each fixed at the corners with brass-headed studs and screws. A ventilating shaft from the kitchen carries away the fumes, and it is fitted with the most approved cooking appliances. Ice troughs for fish, fowl, cold meat, &c., and slate tanks for salted meat, are fitted in the larder, where also marble pastry-tables are provided. The wine-bins and vaults are on each side of the underground corridors, and have stone shelves, and the casks will be lowered by lifts.

Ascending to the ground-floor, the principal area of which is occupied by the entrance, two large drawing-rooms extending the whole depth of the new block form the extreme wings. These are adorned with fluted pilasters, carrying cross-beams; the ceilings are panelled and coloured in light tints of buff and green, and the walls are decorated by paintings, tapestry panels and mirrors. One of the main staircases in the old east wing brings us to the first floor of the new building. This is traversed from end to end by a wide central corridor 456ft. in length, including the end wings, is paved with Minton's tiles, and lighted through two long well-holes in the upper corridor floors by skylights in the roof. These well-holes are protected by ornamental balustrudes of wrought iron. A hydraulic lift for visitors is to be provided at one of the staircases in the old east wing. On either side of this corridor the suites of sitting and bedrooms are obtained. These sitting-rooms are about 22 × 14ft., in some cases well lighted by two windows; the sitting-room, with a bedroom and dressing room, are arranged *en suite* in many instances. Each room has a light cheerful paper, a well polished walnut chimney piece, and the woodwork is finished to imitate maple. All the floors are pugged and the corridors are on fireproof arching and girders. At either end of the corridor, lavatories and w.c.'s have been placed for the use of visitors on each floor. A similar arrangement is carried out on the upper floors, the top one being devoted to the servants. We understand about 60 rooms have thus been added, and the new hotel contains besides spacious coffee and smoking-rooms. One very noticeable feature has been introduced in the roadways beneath this new building for the purpose of deadening the noise. This has been done by paving the roadway with large india-rubber sheets, 4ft. wide and 2in. thick, laid on planks. The effect of this paving is to render the traffic perfectly noiseless, a point of considerable importance in connection with an hotel. When the approaches have been lowered, the building will be seen to a greater advantage than it is now. We understand this enlargement has cost the Company about £30,000. The whole of the works appear to have been admirably carried out by Messrs. Kirk and Randall, of Woolwich, the contractors, under the supervision of Mr. Stansby, the company's architect, and the clerk of the works, Mr. Birrell. The carving of the front has been executed by Mr. Loni and Messrs. Aumonier and Roseleb.

THE NEW CENTRAL FRUIT AND VEGETABLE MARKET.

THE members of the Architectural Association visited on Saturday afternoon the new Fruit and Vegetable Market in Charterhouse-street and Farringdon-road, E.C., and were received by Mr. Gosling, from the City Architect's office, who showed the visitors over the buildings, and gave explanations of their purpose. The site is at the Holborn end of the space devoted to the City Corporation markets; a new street is being formed on the southern side of the area, to the south of which it is proposed at a future time to form a flower-market, which will complete the series. The general principle adopted in the arrangement of the plan of the vegetable market is to make the main floor as nearly as possible the level of the poultry market, so that the entire range of buildings are readily approachable, the one from the other. There is a difference of about 10ft. between the road dividing the markets and Farringdon-street; but the floor will be kept level, with gradients to the main approaches. The plan shows an area of nearly 44,000 square feet devoted to wholesale market purposes, surrounded by 41 shops (without dwelling-house accommodation) fronting the several streets, these occupying an additional area of 16,800 square feet. There are three main vehicular approaches to the market area—on the east, south, and north-west, and two other foot-passenger entrances. The market is arranged as a series of shops or stalls, 33 in number, having in front pitching-stands for goods and waggon-stands; these are approached by an 18ft. roadway, which will always be kept clear for wheeled traffic. In the middle of the market is a further arrangement of pitching stands with an area of about 4,400 square feet, including gangways. In roofing, the aim has been to keep the floor as open as possible; the detached columns supporting the main roof are 16 in number, and the clear spans of supports are 47ft. and 56ft. The roofs are of a laminated rib construction, with a range of glass and louvres, affording ventilation and light, but guarding against direct sunlight, and the intrusion of rain and snow. The height of roofs will be 28ft. to plate level, and 40ft. to ridge of louvres. The centre domed roof will have a clear span of 56ft., and will rise to a height of over 70ft. At the junction of Farringdon-road and Charterhouse-street is a domical tower now being covered in, rising to the same height 80ft. above roadway levels as the intended dome. At the south-west angle of site, that nearest the Holborn Viaduct, is a roadway approach to the basement, 20ft. in width, and having a gradient of 1 in 20; adjoining this are placed the clerk's residence, refreshment-house, and lavatory, and w.c. accommodation for market salesmen. The basement is arranged with a general area under the market, and two tiers of vaults under the outer shops, fronting Farringdon-road and Charterhouse-street. The floor of upper market is carried by iron stanchions, 45ft. and 20ft. apart respectively, with wrought-iron girders of similar spans. The stanchions are divided into four classes severally, calculated to bear maximum loads of 170, 240, 285, and 350 tons each. The main girders resting upon these stanchions vary in weight from 15 to 32 tons, the largest being No. 71, the fourth from the south end, which stretches across the London, Chatham and Dover Railway, and under the main entrance in the southern roadway. The weight of this given is 32 tons, its length 62ft., the bottom flange is 2ft. 6in. wide, and is composed of eight $\frac{5}{8}$in. plates; its strength is calculated at 390 tons. All the girders were rolled and built up in Staffordshire, and brought, ready for fixing, by rail, via Stewart's-lane Junction. The total weight of ironwork employed in the erection of the market is over 2,300 tons, and the total length of girders is between two and three miles. The lattice girders supporting main roofs are 4ft. 7in. in depth, and have spans of 56ft. and 47ft. 6in. respectively, the load upon each being from 40 to 50 tons. The construction of the roof columns, which are all of equal size, is somewhat novel, being sections of rolled channel iron riveted together with attached moulded bases. Beneath the eastern side of market are four new siding lines from the London, Chatham, and Dover line at Snow-hill Station; they are now being extended beneath Charterhouse-street and will eventually rejoin the general system of lines at Farringdon-road. Special precautions have been taken to guard against the possibility of an engine getting off the metals and striking one of the columns which carry the upper market. At the most exposed, the S.E. angle, between the main line and new sidings, a solid pier of brick is set around the stanchions, which here and at other exposed points are doubled, either stanchion being calculated to carry the entire superposed weight. As the lines of the upper market do not follow those of the substructure, the arrangement of plan has been a work of considerable intricacy, further complicated by the necessity to suit the railway requirements. The visit of the Association was paid almost too early for members to readily comprehend the scheme; but the substructure is nearly complete, the railway sidings fixed and ballasted, while on the upper level the shells of shops are being prepared for fitting, and a few of the stanchions and roof-girders are in place. The street frontages are of Fareham red bricks with Portland stone dressings, and ordinary stocks are used for the backing; the woodwork is yellow deal. Some criticism was passed upon the style adopted, which is of the Free Renaissance, which characterises the group of markets, modified to suit a somewhat more economical treatment. Messrs. Mowlem and Co., of Westminster, have taken the contract, which will amount to between £150,000 and £160,000; Mr. Beresford is the clerk of works.

THE STONE FOR TRURO CATHEDRAL.

AN animated discussion is proceeding in the newspapers of Cornwall and Devon upon the report of Mr. J. L. Pearson, R.A., as to the building stone to be used for Truro Cathedral. It will be remembered that the report, which we published last week on p. 591, recommends Bath stone of best quality and placed on natural bed as that most suitable, on the grounds of lowness of cost, ease in procuring of required sizes, facility of working and weathering qualities. Mr. W. J. Rawlings, of Hayle, urges that it would be an offence against propriety to erect a Bath stone cathedral in a hard stone district, and that if an impressive, dignified, and suitable cathedral cannot be built at Truro out of Cornish stone, it will be because of want of skill in application, and not from want of good material. It would not be desirable to try to square and trim Elvan (porphyry) stones, but, used in their natural manner, the cost of building, inclusive of labour and material, would be less than that of rough Bath stone delivered at Truro. Mr. Thomas Clark, of Truro, a highway surveyor, and well known practical geologist, assures Mr. Pearson that large blocks of Seveock stone could be obtained of from 2 to 6 tons, containing few veins or faults, and in sufficient quantities to build two cathedrals; it is not so hard, he says, as the hardest granite, and owing to Lord Falmouth's promise to remit the dues on any stone from his quarries used in the cathedral, the price of Seveock stone, delivered in Truro, would be 3½d. per cubic foot, against 1s. 9d. for Bath stone. Well dressed, plain worked, St. Stephen's granite could be supplied at Bath stone prices, while Ladock, St. Stephen's, and Prober's church towers will bear comparison for wear with Wells Cathedral or Bath Abbey. Mr. A. K. Carlyon, of Fowey, contrasts the state of St. Austell's tower and Lostwithiel spire, built of Pentewan stone, with works executed in Bath stone, and asserts that there need be no practical limit to the size and quantity of Petewan to be got, if the quarries were properly opened out. Mr. Thomas Firks, builder, Liskeard, gives similar testimony and states that in a house he built at St. Blazey, 36 years since, the chisel marks can now be seen on the Pentewan masonry. Another writer quotes from the fabric rolls of Bodwin church, c. 1470, to show that Tregarthyn (Pentewan) stone was used for mullions and windows, and says its condition there and in the Friary hall (1350), a modern corn-market at Bodmin, is better than the Bath stone in Truro public rooms. "L. C." calls attention to Antony House, near Torpoint, built a century since of stone brought by water from Pentewan, and where the edges are still sharp and true. Mr. Wm. Argall, of Breage, quotes the opinion of Mr. J. Piers St. Aubyn, of the Temple, as to the quality and ease of working the Breage white granite. Another correspondent, a builder, states that he has before him specifications for the restoration of the spire of Holy Cross Church, Kenmare, Killarney, which was only erected a few years ago, and in which he is directed to remove all Bath stone dressings and Bath stone wherever found, and replace with white limestone. In another letter, by a resident at Gunnislake, it is denied that Cornish granite is shaky, and the dissatisfaction occasionally caused by the material is attributed to the unscrupulous introduction of surface-granite. Mr. Frederick Ashwell, C.E., Truro, says that he reopened the Wild Duck quarry about two years since, and has taken out stones above 7ft. by 4ft. and 18in. thick with a true face; the quantity required for the cathedral would make no impression on the vast masses procurable; it is a fine stone and imperishable; and from actual experience he knows that, quarried and dressed, Wild Duck stone can be delivered in Truro, ready for setting, at 1s. 4½d. per cube foot, against 1s. 9d. for Bath stone, delivered in the rough. Mr. A. Adamson cites the report of the Commissioners for selecting stone for the Houses of Parliament, as stating that Bath stone absorbs more water and has less cohesive power than any other stone examined by that body. He asserts, with questionable taste, that celebrated archi-

tects recommend it because it can be got out of hand quickly, and they sooner get their commissions paid them. Another writer, "H. C. G.," goes further, and in a letter which reflects little credit on him or on the journal which has published it, gives circulation to the absurd rumour that "architects recommending Bath stone obtain a higher (!) commission from the owners than they would obtain from the owners of other quarries." "Cornwall" says that the Elvans are harmonious in colour, and practically indestructible, while the Bath stone used in restoring Henry VII.'s Chapel, Westminster, and many other London buildings, is rapidly crumbling away. The Rev. F. C. Hingeston-Randolph, rector of Ringmore, admits that Bath stone set on its true bed does harden by exposure, and may be relied on as fairly lasting; but suggests the difficulty of guaranteeing fulfilment of the conditions of careful selection and natural placing. He used Bath in the renewal of every window of Ringmore Church in 1860, but while the greater part stands well, four or five pieces from the same truckload began to disintegrate at once, a process Mr. Hingeston-Randolph checked effectually by paying them over with linseed-oil. He gives other instances of the risk involved in the use of Bath stone, and supports a suggestion originally made by Mr. Chappell Hodge, that Moorswater stone be used for external walls and something worthier than Bath stone for the dressings. "E. E." concedes that Wild Duck could not be depended on for delicate tracery, as it chips under the chisel, and that Mabe stone is too costly; but suggests that Bath stone should be used inside, Doulting or Chilmark outside, with Mabe granite for plinth and buttresses. "B." proposes Cornish granite for outside walls, and Chilmark for all other purposes, and urges the committee to show faith and courage, and issue wider appeals for the funds. Another writer, whose letter is printed in leaded type, and whose style appears very familiar to us as that of an old and valued correspondent, asks whether it would not be better to give up the idea of using stone altogether, and employ the material in which Mr. Pearson has done some of the most admirable work of the present generation—brick. Much, he says, of the enduring material in old churches, said to be from the Bath quarries, he has found to be of Caen stone, and still more of the stone from Beer, East Devon, of which Exeter Cathedral is built. The Cornish stone, known at Bodmin as "Margate" stone, is somewhat heavy in colour, and not comparable with either Pentewan or Polyphant; but it is admirably enduring, raises easily and in quantity, and is free working. The St. Stephen's granite he dismisses from consideration as only "nominally granite" in any technical building sense. A stormy feeling is imported into the controversy by many of the writers, who appeal to the clannish "One-and-all" spirit of Cornishmen in favour of the selection of a material which will give employment to inhabitants of the county, and urge the committee to hesitate before doing anything which would damage a staple trade of the locality. Mr. E. T. Stopford-Sackville, of Fowey, gives practical expression to his feeling by offering to subscribe £25, in addition to £50 already given, towards defraying the extra expense that may be incurred by using Cornish stone; and an "Oxford Graduate" follows this up with a promise of an additional £5 a year for three years, if a more durable material than Bath stone be used. The adjourned meeting of the Cathedral committee to consider the question takes place at Truro to-day (Friday).

STONE PRINCIPALS AND INTERNAL ARCHES.

A VERY rare mode of constructing roofs is that in which stone principals occur instead of timber. The examples in England are few, and one or two are mentioned in the "Architectural Dictionary." The south transept of Minchin Hampton Church, Gloucestershire, has a pair of stone principals, and at Willingham, Cambridgeshire, a smaller instance may be seen. At Carlow a stone principal is constructed in the shape of a trefoiled arch within an acutely-pointed arch, the object of which form is apparently to obviate the necessity of counterforts on the outside, though the writer does not give details. The weight of stone concentrated at the "cusps" of the trefoil arch were no doubt intended to act as counterbalancing forces, their centres of gravity falling within the walls. Stone ribs supporting the purlins of roofs are common in many churches, and their object was doubtless to save trouble. Whatever motive induced the old architects to use them, it is quite certain these principals add to the monumental character of a building. The stone arching connects, in a pleasing manner, the two opposite walls, and the roof becomes a more integral part of the structure than it does when timber is employed. But the construction requires considerable care, and the centring should not be "struck" till the work has had good time to settle. If the walls are thick and low, the springing of the ribs may be made to commence low down, and the side walls do not require any buttresses, and it is a common and very effective manner of roofing porches, small chapels, &c. In lofty structures the employment of stone principals is more doubtful, for unless there is ample masonry provided in the form, either in internal piers or external buttresses, observed in some of the churches in the South of France, great risk is run, as there are not a few examples to witness in spreading naves and fractured arches. In this connection we may point architects to tower and chancel arches, many of which, both in old and modern churches, bear evidence of the "sleepless" activity of the arch, when improperly tampered with or not duly buttressed. Many an old Norman and obtuse-pointed Transitional arch to be seen in the village churches in the south and west of England, shows signs of the weakness and instability of the abutments. In probably more than half the cases to be met with, the fault lies with the tampering spirit of later times in making external vaults for interment, or in injudiciously-performed alterations—as for instance, the enlargement of a church by the addition of transepts. During the progress of these alterations, the wall is cut through and weakened, no shores are erected to help the abutments, which have been so recklessly deprived of their bond with the adjacent walling, or the excavations for the foundations of new work are made in dangerous proximity to old buttresses or footings. In new churches we have seen chancel arches cracked, and serious signs of instability in the masonry of the walls; it is not unfrequently the practice in these days of partial building, to afford a temporary support to the chancel arch before the aisles are added by the erection of a rough brick flying-buttress on the outside; but, it is needless to say, very much more caution is required than is sometimes taken. In one case we know, where this expedient was adopted, the result has proved so bad that the arch will doubtless require to be rebuilt sooner or later. The chief point, of course, is to make such a buttress the permanent one, so that it will not require to be tampered with when the additions are made; and to secure safety the centring should be very carefully "struck," and not until the work has been quite finished, and the mortar set. Architects might very well take a lesson here from their brother-professionals the engineers, although the latter cannot be said to be always infallible in their arch construction. A pleasing proportion of an interior arched opening is one in which the eye naturally takes immediate cognisance of the proportion between it and the solid masonry of the abutments, and discerns nothing to offend it. In very many of our new churches, the mass of masonry above the arch-crown often reserved for mosaic or colour decoration is disproportionately large to the abutments, or the span looks exceedingly wide for the buttresses, and whenever we meet with such an instance, the suggestion of a counterfort sufficient and necessary to satisfy visual requirements and set the mind at rest is important. The question is one which concerns good proportion as much as mechanical stability; and, in fact, if the eye were consulted and followed in this and similar matters more loyally than it is, we should have better and more carefully designed buildings—appealing to our sense of just balance of parts and artistic fitness.

THE PLACE OF PICTURES IN THE DECORATION OF A ROOM.

ON the whole, writes Mr. Lewis F. Day, in the *Magazine of Art*, instead of pictures being, as is supposed, the simplest solution of the decorative problem, the difficulty of assimilating them is such that in most cases the best plan is to content oneself with very few indeed, and those only of the best, substituting for the rest more careful and thoughtful decoration. Where good pictures are, on account of their costliness, out of the question, good decoration is usually within reach—so near, in fact, that it is apt to be overlooked. Then there is the pleasure, or at all events the pride, of the collector to be taken into account, and the fancied security of investment: many a man hesitates to spend shillings in decoration where he lavishes pounds upon paintings.

It is not often, however, that pictorial art, and that the best of its kind, is altogether unattainable. Photographs have the unpardonable fault that they fade before our eyes, grow paler, and dimmer, and yellower, and ghastlier as the days go on, until only the horrid ghost of the picture that pleased us confronts us in its place. Still, there are photographic processes that claim to be (and no doubt are) permament—their names will occur at once to every one; there are etchings which give the work of the artist at first-hand without intermediate mechanic; there are mezzo-tints; and, lastly, there are wood-engravings, almost perfect in their way, and only so cheap that they are not thought to be worth framing. There is something almost superstitious in our reverence for a painting in oil. How few persons think of adorning their walls with fine mezzo-tints! Our hearts are set on cabinet pictures, and we spend more on a single second-rate, if not worthless, painting than would suffice to line our walls with works of real though less pretentious art. Why is this so? Is it the colour that attracts? Not altogether that. If colour were the charm we should find enamels and embroideries, at once more gorgeous and less costly than paintings, exhibited in honourable positions on the walls where they could be seen. It cannot be the subject that is esteemed, for that is common also to every form of engraving. The pride of possession may account for it in some degree; there is a pleasure in possessing what is unique, and the perpetual repetition of a beautiful thing does deprive it, if not of its beauty, of some of its charm. Probably, the chief attraction lies in the prestige attached to picture-painting—a prestige altogether beyond its deserts. If the value of art is not merely as decoration, neither does it consist in immortalising dead herrings or living nobodies. Rich hangings and fine furniture are perhaps as well worth having as the painted "texture" of silk and satin and the ordinary costume that go to make so many a picture. Once more, a picture is only worthy of the first place in proportion to its worthiness among pictures; a painting as such is not necessarily above ornament, or available as ornament; and a whole collection of inferior paintings has less value as art than a simple room that has been decorated with skill and thought and judgment.

Allusion has been made to decorative painting. What, it may be asked, is decorative painting? There was a time, perhaps, when all painting was more or less decorative; now it is for the most part very far removed from anything of the kind. Both painting and sculpture (which we are accustomed to dignify by the title of "fine" art) and decorative art, appeal in the first instance to the eye, and their first, if not their highest, duty is to satisfy the eye. So far their ambition is the same. But neither of them stops there. Each attempts something more than that, and it is in this ulterior effort that their aims diverge: the further they go, the wider they wander apart. Fine art having duly satisfied the eye, seeks to express some thought or sentiment, some feeling or impression, perhaps some dream or aspiration of the artist. Decorative art has, over and above beauty, and even before beauty, to fulfil some useful purpose. Sometimes, indeed, to beauty and the expression of himself the painter adds a decorative element, by adapting his design to some special purpose, as when he paints a picture with a view to the particular position it is to occupy; and sometimes the decorator puts into his work such meaning or such feeling as to raise it to the level with fine art, be it ever so fine; but the distinction is, for the most part, only too broadly defined, and it is seldom that one need hesitate whether to describe a work as a painting treated decoratively, or as a decorative panel.

"BUILDING NEWS" DESIGNING CLUB.

A GAMEKEEPER'S COTTAGE.

THE designs submitted for this subject are numerous, and many of them exhibit skill in planning and good points in the external treatment. (1.) "Quiet and Simple" is the motto of the design we have chosen to place first, chiefly for the compactness of the arrangement and the simple grouping of exterior. The author gets all his rooms within a square, groups his chimneys in the centre, and economises his roofing. The sitting-room is made to communicate directly with the kitchen and forms the private part of the house, while the hall and gun-room, with lavatory and w.c. opening out of the latter, are separated, and can be used by the sportsmen without interfering with the private part. The lobby arrangement for hats and coats and the bedrooms are well treated. Externally the cubical form, with a high pyramidal roof and central stack, has been adopted, and the walls are proposed to be brick with Late English features. (2) "Jack" has a fairly good plan, but the hall arrangement is not so happily managed as the last; the gun-room, 10ft. by 8ft., is rather small, and the separate door to kitchen from hall unnecessary. The entrance to gun-room, opposite fireplace, leaves little comfortable space for sitting. The elevations are unpretending and artistically grouped in Late Gothic; rubble with dressed quoins, or flint and red brick quoins, are proposed. The upper-story is tile-hung. We take exception to the gabled window of bedroom, the lights of which are not central with the centre line of gable. Some of the windows are cramped in height. (3) "Per": This is a quietly-drawn design, though the small tower is superfluous for a cottage. The detail is Late 17th Century, and the walls are brick. In plan the principal objection is the door to kitchen, which faces the porch, a fault which might easily have been avoided. In other respects the house is compact and the treatment sensible. (4) "Nemo" is a neatly-drawn ink set of elevations in a Domestic Gothic half-timbered style, with corbelled bay windows on the upper story. The plan shows a hall with staircase, a living-room, and kitchen on one side, and a small gun-room, 12ft. by 8ft., with doorway near entrance; the kitchen doorway leads from the hall, which might have been avoided by having a doorway between living-room and kitchen. A kennel is shown at the back. Generally, the fault of the plan is that it is too cut up, and a simpler arrangement would have been better. (5) "Cui Bono" is a simply-grouped, well-sketched, timbered building, in brick and plaster, with casements suitable for the object intended. The plan fails in detail; the kitchen door, directly opposite the entrance, might have been avoided, and the entrance to gun-room is cramped. (6) "Beta" is another characteristic cottage, simple and unpretending in style, with a tiled upper story and with Queen Anne windows. A similar fault to the last occurs in the plan, which might have been simplified in the arrangement of doorways and walls. (7) "Ephraim" shows a neat cottage in brick and tile with framed timber gable in a Domestic Gothic style, but rather expensively finished in the detail. The plan has well-separated private apartments, with a good gun-room on the left hand of porch, and the author shows a small cupboard for powder opening from the gun-room. (8) "In Hoc Signo Vinces" is a trim little cottage of rubble, tile-hung in upper story. The author has a separate outer though covered entrance to gun-room, with its own convenience; the private passage to the house, and the stairs are much too cramped. The staircase is finished as a lead flat above in a rather pleasing manner.

Many of the designs we have received are of too elaborate a character. "T. A. H. in circle," for instance, loses sight of a gamekeeper's cottage in giving three gables. The plan is fairly contrived, though the kitchen entrance and offices might have been better arranged. "Merit" is awkwardly designed in the roofing, and the kitchen communication and the double entrance are undesirable. No back offices are shown, "Jackdaw" sends a characteristic timbered cottage, the framing to be filled in with concrete. The gun-room is separated, but small, and the lobby hardly wide enough. "Tom Pinch" has a plain well-grouped elevation in brick and timber, but the gun-room can only be approached through a back yard or the kitchen and scullery of the private house, and the entrance from the yard, as shown, is small, and close to the coals. "Pupil J." goes in for a similar external treatment, and the large gable elevation shows good detail and careful drawing, but the porch and inner vestibule are awkward and crowded; the living-rooms are closed off by a vestibule door, and the gun-room forms a low-roofed adjunct on one side. "Bonus Hominus" has some points of merit, but the plan and details are too elaborate. The hall and cross passage cut off the rooms and add to the cost; the living-room and kitchen might have opened into one another, and the chimneys simplified. "Rex" is rather prim in the elevation; we don't like the very fragile-looking porch, nor the position of kitchen-door, and the lobby is small. "Juvenis" affects too much the lodge style, and though the elevations are neat, the plan shows disregard of common proprieties, as the kitchen-door opens directly from the entrance porch, close to those who enter, while the gun-room is placed in the inner side of house, and is quite cut off from the entrance by the private rooms. The gun-room should have been where the kitchen is. "En Avant"—this is a fairly good plan; the gun-room is on the left of entrance, distinct from the private part of cottage, and the chief fault we find is the absence of all conveniences, and the rather finical manner in which the timbering in the upper story and the porch are treated. "Peace," in circle, has a plan rather cut up by the passage; the entrance is close to the gun-room door, and there are no conveniences shown for sportsmen. The sketch is simple, but rather incoherent, and the half-hipped end ugly. "Strad," shows a timbered cottage with open balcony; the hall and entrance to gun-room are contrived in the most unskilful manner possible. "H. E. S. W." makes the gun-room a separate projection, entered from the porch, and the living-department is kept properly apart; the two doors to the w.c. are objectionable, and the offices rather crowded.

A number of other designs fail in planning. Thus:—"Iota" makes his kitchen and living-room doors open close to the entrance, while the gun-room is made, oddly enough, a back-room; "Eclipse" makes a separate entrance to gun-room from an outer verandah, but no conveniences are shown attached to it, and the house is shallow and too cut up in elevation. "Tempus Fugit" adopts the annex form for the gun-room; but the plan is crude and ill-considered. "Good Luck to Your Fishing" is expensive in detail, and the plan partakes too much of a small villa. "Cambria" places the gun-room behind the sitting-room, and shows a back doorway; the kitchen is too prominently placed; elevation is neat; "Trial" has the germ of a good plan, though rather cramped in the hall and entrance; "V in Circle" shows a convenient gun-room, but the kitchen-door is not well placed; "Hamlet" shows no conveniences to gun-room; "Squib" is too villa-like, and the gun-room large; "Ambition" fails in the entrance, and the doors to private rooms are too obtrusive; "That's My Idea" is not economically planned, though a separate gun-room entrance is shown; "Belteshazzar," arranged as octagon, is compact, but the gun-room is spoilt by the shape; "Snow Flake" is another octagon plan cramped; "Home" has a fair plan, the entrance to gun-room being through a porch, but the treatment is expensive; "Lancaster" and "Kairon" are rather crudely worked out, and the plans poor; "Shalloch," "Quid," and "Con" are cut up, and lack simplification; the gun-room and w.c. in the former are not well-placed. The faults of most of the latter are chiefly attributable to want of experience and skill in the planning of small buildings, and in taking types of houses ill adapted for the purpose intended.

PARTITIONS OF BUILDINGS.

IN nearly all buildings, timber partitions form a part, and there are few houses without them in the upper floors. Although a well-planned house ought to have few of these subordinate divisions, they nevertheless enter largely into the construction where a number of bedrooms, dressing-rooms, and closets are required. One of the duties of the architect is to render partitions light, impermeable to sound, and incombustible; but there are few attempts made to construct them otherwise than Nicholson and the carpenters have laid down. A quarter-partition, lathed and plastered, is the only kind generally used in houses, and though construction of this kind, if properly trussed, is very durable, it cannot stand the action of flames long, as the outer coats of plastering soon peel off. There are other modes of construction which architects would do well to use, and perhaps terra-cotta or concrete slabs offer advantages few other materials do. Hollow brick or porous terra-cotta partitions can be made to any thickness, say, 4in., and in America a very light and fireproof partition is made as follows:—A number of stout wires are strained vertically from floor to ceiling about 4in. apart, and boards are then set up on one side, allowing 1in. space between, and gauged mortar is then thrown against the boards through the wires, till the stuff is 2in. thick, thus embedding the wires. This face is then floated, and the boards removed, and a solid 2in. plaster partition is thus formed. The system has nothing new in it; in fact, many fire-proof concrete ceilings are made in the same way, light bars of iron being strained across to form a core. In Paris a very economical partition is made, occupying little space, which is light, impermeable to sound, and fire-resisting. It consists merely of rough, wooden studs or posts, with necessary door-posts, struts and braces, placed about 1ft. 6in. apart. Laths are nailed across these studs about 3in. wide, and about 4½in. apart. The space between is then packed with rubble, light stone, or old plaster, and the surfaces afterwards rendered. Lime and hair, and even loam, have been used for filling in wood frames in a similar manner. Partitions well filled with light rubble, and then plastered, may be rendered quite as light as the most complex truss partition if discharging-pieces are introduced in the framework. For lightness and finish, a well-framed partition, covered with inch concrete slabs, and filled with old plaster, seems to possess all the advantages required in excluding sound, and rendering rooms fire-proof; and laminæ for this purpose have been manufactured. For shutting out noise, an ordinary partition may be filled with slag wool (silicate cotton), which is said to be also indestructible, either by vermin or fire.

When thin partitions of a durable and incombustible kind can be constructed in either of the ways indicated, it seems absurd for builders to content themselves with the hollow timber trussed erections, which are seldom sound-proof, and invite fire. Board-and-brace partitions are even worse, yet they may be found in many of our large warehouses and factories, with flaming gas brackets attached to them. We have even seen match-boarded partitions actually charred by the flame of such light. As regards expense, a slab partition may be constructed for less than a trussed partition, while the addition of some substance like plaster or sawdust, and ashes as a filling, would be very trifling. There are several hollow blocks containing Portland cement, that are capable of forming partitions free from all the objections that may be urged against timber, and their solidity and architectural thoroughness ought to favour them in the eyes of architects. The door architraves, lintels, and other decorative finishes, such as skirtings and cornices, can be easily moulded in the same material, and all the complicated devices of the carpenter in forming "grounds," and jamb-linings for the doors, and "boxings" for windows, be superseded by more substantial construction.

THE ST. STEPHEN'S ART SOCIETY.

THE first exhibition has been opened of the St. Stephen's Art Society, Palace Chambers, Westminster, and from the pictures we have seen, we think it commences its career with an augury of promise. We may say at the onset that the society has been established on a proposal set forth by Mr. John Rorke, in which that gentleman engaged to bear the total annual expense of providing exhibition rooms, and defraying expenses for the exhibition of works in oil and water-colours of a number of subscribing members, whose subscriptions, and the sales of whose works, would go towards recouping the expenditure. A charge only of 5 per cent. on the sale of works is made. The society is to be managed by a committee selected from the members; no member is responsible beyond the amount of his

annual subscription of £2 2s., and the subscribing members have the privilege of exhibiting throughout the year one work in oil or water-colours, together with a folio of sketches. One of the chief advantages of the society is that it will afford to artists a means of exhibiting their works and bringing them before the notice of the picture-admiring public, who will be admitted on the presentation of a card. Among the oil-pictures we notice a few landscapes of considerable merit. A view of "Christchurch from the Marshes," by J. B. W. Forster, well painted in the atmosphere; and Mr. W. Biscombe Gardner's fine landscape, "Autumn Glory," showing an expanse of open country from a hillside clad with firs of green, yellow, and russet tints, are probably the best. Mr. J. Dakin exhibits a sunny piece, "Under the Willows," and Mr. Stuart a bold mountain study in Wales, "Passing Sunbeams," very clever in the management of the light. "Alice Bridgworth Dancing before her Father" is a cleverly-painted incident, simple, and broadly handled; and Mr. G. C. Hindly has produced a very able serio-comic work in his "Trap to Catch a Sunbeam," in which a fair maiden is descending some stairs, lured by the strains of music, which a gallant, seated in a tapestried-room, is playing on a guitar. The accessories of this picture and the light and shade are introduced with telling effect. The studies of brook and birch trees by Mr. J. Kinnaird; "Waiting," a large picture, solidly painted, of a touching incident by Mr. Symons; "Bowl of Daffodils," by Mr. Williams; and a small spirited study, "The Guide," by E. Crofts, A.R.A., will enlist attention. We may also notice in passing Mr. J. Clayton Adams's highly-executed "Garden of the Copse," an Italian view by Mr. C. T. Garland; Mr. R. P. Staples' group of listeners in a church, "First Lesson," excellent in its atmosphere and colour; Mr. G. Chester's "Sermon in Stones," Mr. A. F. Grace's "Homeward," and Mr. Wyke Baylis's grand architectural piece, "The Bride's Door, St. Sebald, Nuremburg," a work we have seen before. Mr. W. Severn, the secretary, contributes a fine view of rocks and blue sea in his view at Sark, in water colours; and Mr. A. de Breanski, a Welsh scene vigorously handled, fresh and cool in the colour of the mountain and meadow. Miss Wall's "Broadstairs," Mr. T. R. Macquoid's Spanish sketch, Mr. W. A. Ingram's sunset sketch of Rome; Mr. Rickett's "Dover," and Mr. C. F. Robinson's masterly bit of colouring, "Shiel Bridge," are a few of the best drawings in water-colour, in which class we must not forget to name Mr. G. Nattress's "Interior of St. Mark's, Venice," a well-studied drawing, and Mr. A. C. Bell's Venetian sketch of "Santa Maria Saluta." Mr. A. Williams's Alpine drawing, the "Saasgrat," is as remarkable for its technical manipulation as for its grandeur. Some of the pictures deserve to be hung in a better light, and a few less screens would have been more desirable in the interests of the pictures. The Society have, however, every reason to be satisfied with the first response to their appeal, and it is something that the provisional committee comprises so many names of note in the art-world.

GLASGOW MUNICIPAL BUILDINGS.

A SPECIAL meeting of the Glasgow Town Council was held on Wednesday, for the purpose of considering the minutes of the Committee on New Municipal Buildings. The Hon. John Ure, Lord Provost, occupied the chair.

The Committee resolved to approve generally of the plan, and recommended as follows:—

"1. The competition shall consist of a preliminary and final competition, the former being open to all and the latter being limited as after provided.

"2. An architect shall be immediately appointed to advise with the Magistrates and Council as to the preparation of conditions of competition.

"The Magistrates and Council will afterwards appoint an architect or architects to (1) select the competitors in the preliminary competition who shall be invited to compete in the final competition, and (2) to advise the Magistrates and Council in the selection of the four best designs in the final competition.

"None of the architects to be so appointed shall be a competitor, nor be interested directly or indirectly in either the preliminary or final competition.

"3. The preliminary competition shall be open to all, and shall be limited to sketch designs. These sketch designs shall include both plans and elevations, and shall be prepared in conformity with conditions to be afterwards adjusted.

"4. Plans of the internal arrangements, designed by Mr. Carrick, shall be submitted to competitors as showing the general accommodation required; but each competitor shall be at liberty to suggest such disposition of the whole internal arrangements, including accesses, as he may think best.

"5. Competitors shall obtain Mr. Carrick's plan and descriptive report thereof on payment of £1 1s.

"6. From the competitors in the preliminary competition not fewer than six nor more than ten of the best shall be selected by the architect assessor or assessors for the final competition.

"7. The competitors in the preliminary competition thus selected shall prepare fully-matured designs to a large scale; and each of the selected competitors shall receive a fee of £150 to cover the expenses of the designs, provided he comply with the conditions of the final competition to be afterwards prescribed.

"8. From the designs lodged in the final competition, four shall be selected, in the order of merit, by the Magistrates and Council, with the advice of the architect assessor or assessors, and the author of the first shall be employed to execute the work on the usual professional terms of remuneration, unless any insuperable obstacle (of which the Council, with the advice of their architect assessor or assessors, shall be the sole judges) prevents such employment, in which event the author of the second design, and, failing him, of the third design, and, failing him, of the fourth design, shall be employed.

"9. The conditions of the competition shall be strictly enforced, and all designs which do not comply with these conditions shall be excluded from the competition, and returned to the authors immediately on such non-compliance having been ascertained by the architect assessor or assessors.

"10. No restrictions shall be imposed as regards the style of architecture, but a preference will be given to a Classic style, of a broad and dignified, rather than of a florid, character. The principal elevation shall be towards George-square.

"11. The cost of the entire structure, including architectural embellishments, but excluding painting and furnishing, as the same shall be afterwards defined, shall be about £250,000.

"12. No drawings or photographs, nor written nor printed statements descriptive of any competitive design, shall be circulated either among the Town Council or the public, nor shall the designs, or copies thereof, be exhibited publicly or privately till after the final award is given and published, nor shall any canvassing of the Magistrates and Council, or of the architect, assessor, or assessors, in favour of particular designs take place.

"13. In the preliminary and final competitions the design shall be lodged on or before dates to be afterwards fixed."

The Lord Provost briefly referred to the position in which the subject-matter stood, and stated that for his own part he was satisfied, after having examined the proposed plans, that the arrangements, if carried out, would fulfil all that the Act of Parliament desired they should make provision for. The conditions of the competition that would be put before the architects were of an ample character. They gave an indication of the accommodation which it was desired to have, and how it could be best put together for the proper working of the departments. Without committing themselves definitely to these arrangements, they left them to throw together the rooms in a better form, and his Lordship did not feel he was tied down exactly to the arrangements Mr. Carrick had put before them. He believed it embodied all that was needful they should have; but, at the same time, it was a quite likely thing that some rearrangement might be justly managed by a competent architect. That being the case, there was little more to do at the present time than to recommence on a course that he hoped would end satisfactorily for all of them. He, therefore, moved the approval of the minutes, and that it be remitted back to the committee to carry out the suggestions; and if that was done the matter would not be delayed, but be gone on with immediately.

Treasurer Hamilton, in seconding the minutes, called attention to the eleventh suggestion of the committee, that the cost "shall be about £250,000." He wished as a member of committee to point out that this word "about" was considered a difficult term to manage. He believed it was the general impression among the committee—and he knew that Dr. Marwick expressed himself strongly on the point that that should be a settled point—that instead of "about" £250,000, it should be, "not to exceed" that sum. He might further add that the committee considered that as these were the words of Mr. Jamieson's motion passed by the Council, they should be left to be altered by the Council. He begged to move accordingly.

After considerable discussion a division took place, when the amendment was carried by 25 to 8, one member declining to vote. It was then agreed to remit to the committee to make the necessary arrangements for the competition.

The Lord Provost then submitted the following motion:—"Approve of the Municipal Buildings Committee minutes of 28th April and 3rd inst. and the sub-committee minutes of 2nd inst., and remit to the committee to make the requisite arrangements of the proposed competition, preliminary as well as final, on the principles set forth in the outline of conditions of proposed competition as now decided, with power to select an architect or architects for all the purposes specified in article 2 of the outlines of conditions."

Preceptor Mathieson reminded his lordship that he suggested that in regard to the selection of an architect the words "may be" should be substituted for "shall be."

The Lord Provost thought this was a most vital part of the whole matter. If there was any hesitation on the point, a division of the Council should be taken at once.

Preceptor Mathieson had no desire to press his suggestion at all.

Mr. William Stuart inquired whether the employment of an architect or architects covered the engaging of a measurer.

The Lord Provost answered in the negative, adding, however, that if the Council desired it, the words "any other professional assistance" might be inserted in the motion.

The motion was then agreed to.

CHIPS.

The erection of a new church in Barlow Moor-lane, Didsbury, has just been commenced. The structure, which is in Gothic style of Geometric character, or 13th century, from the drawings of Mr. Henry Littler, architect, of Manchester, will consist of a nave with north and south aisles, transepts, chancel, and vestries. Provision has been made for 602 sittings. The entire cost of the erection will be about £11,000.

A new Wesleyan chapel at Norbury, Cheshire, was opened on Thursday, May 19. The style of the building is Early English, and the masonry is of Grinshill freestone. The chapel has been erected by Mr. James Pickard, builder, Whitchurch, from designs prepared by and under the superintendence of Mr. James H. Pickard, architect, of Crewe and Whitchurch.

A large schoolroom and 24 class-rooms, so arranged that the latter all open into the principal hall, are about to be added to the buildings of the Baptist Chapel at Falmouth. Mr. James Hicks, of Redruth, is the architect.

A stained-glass three-light window has just been just been placed in the north transept of St. Matthew's Church, Thorpe Hamlet, Norwich. The style is Early English, and the subjects are the "Good Samaritan," and on either side, "Visiting the Sick" and "Feeding the Hungry." The work was executed by Messrs. J. and J. King, of Norwich.

With a view to the protection of the interests of native cement manufacturers, the Russian Ministry of Finance intends to raise the import duty on foreign cement to seven copecks. It is added that the increased duty will extend to the ports of the Black Sea and the Sea of Azov, and come into force on the 1st prox.

At the City Court of Common Council last week, on the suggestion of the Library Committee, it was determined to purchase from the executors of the late Mr. J. W. Baily, his collection of Roman, Mediæval, and other antiquities found in the City from 1863 to 1872 at a cost of £650.

The building of the Carnegie free library has been commenced at Dunfernline, and the memorial stone will be laid in July next. The preliminary works of excavations and foundations are being done under contract by Mr. Malcolm.

The local board of Whittington, near Chesterfield, last week opened applications for the vacant office of surveyor. Forty-four were received, including one from a man who candidly stated that he had recently left gaol, after serving imprisonment for theft; the salaries asked varied from £70 to £200. Mr. Kirk, a local applicant, was appointed, the remuneration to be £80 per year.

A stained-glass memorial window has just been placed in Church Stanton Church as a memorial to Miss Edwards. The four subjects are Our Lord speaking to the Samaritan woman at the well, raising the daughter of Jairus, cleansing the woman who touched the hem of His garment, and admonishing Martha. The work has been carried out by Mr. F. Drake, of Exeter.

Amongst those upon whom the Queen has conferred honours, in celebration of her birthday, are Mr. Hector Lewis Langeom, Canadian Minister of Public Works, who has been made knight of the order of St. Michael and St. George, and Mr. Malcolm Fraser, surveyor-general of Queensland, and Major-General Jas. Robert Mann, director of roads, Jamaica, who have been made commanders in the same order.

James Shaw, builder and contractor, of Sheffield, a married man, eloped last week with a former sweetheart, and their dead bodies were afterwards found in a reservoir.

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ILLUSTRATIONS.

MR. HAMO THORNYCROFT'S HOUSE AND MR. RUSSELL BARRINGTON'S HOUSE AT KENSINGTON.—DESIGN FOR THE INTERIOR OF AN EXCHANGE.—NEW CHURCH AT WATERMILLOCK.—IN THE TRANSEPTS, ST. GREGORY'S CHURCH, DOWNSIDE.—PORCH, OLD MORETON HALL.

OUR LITHOGRAPHIC ILLUSTRATIONS.

ARTISTS' HOMES: NO. 13—MR. HAMO THORNYCROFT'S HOUSE.

MORETON HOUSE, with its studios, which we illustrate to-day, is an unusually interesting building, and it is the first sculptor's house which has been given in our "Artists' Homes" series of illustrations. It is erected in the Melbury-road, Holland Park, Kensington, and belongs to Mr. Hamo Thornycroft, A.R.A., and included in the same structure are several studios for painting purposes, inasmuch as Mr. Thornycroft's family is, in more senses than one, correctly described as a family of artists. The building was erected by Mr. Thornycroft himself in 1876, with the advantage of suggestions and technical knowledge afforded by Mr. J. Belcher, architect. The builders were Messrs. Adamson and Son, of Turnham Green. Its plan includes really two distinct residences, the second house being occupied by Mr. Russell Barrington. One of the necessary features to a sculptor's studio is, of course, a side-entrance, or back way, through which large blocks of marble and loads of clay, or big models, may be brought in. This, in the present instance, has been very cleverly contrived at the side from the Melbury-road by a passage-way taken out of Mrs. Thornycroft's studio behind the statuary gallery, on the ground-floor, and under Miss Thornycroft's painting studio above. The sections clearly show how this is managed, and the alcove or recessed space in the lower studio forms an admirable feature really for the exhibition and display of busts and other small statuary. Another necessary condition to be observed in planning a sculptor's studio is its isolation from the house, and this is chiefly, of course, due to the dusty nature of the work to be done there; and, in fact, it is the dust which renders it a difficult matter to treat a sculptor's studio with any degree of finish or decorative character. Mr. Thornycroft's studio is cut off from the house by a prettily-arranged conservatory, and it is a lofty structure 60ft. long by 30ft. broad. Extending beyond this is a "private den," or "own room," with a low alcove like a garden-house at the end, from which peeps of the grounds may be obtained. Returning to the ground-plan, it will be noted that the entrance is by a side approach leading to a vestibule, from which either the private house itself is reached or the statuary gallery with its top light and salmon-tinted walls. Divided from this gallery by a curtained arch is Mrs. Thornycroft's studio, as already described, and beyond is the conservatory leading to the main studio. Thus a direct communication is secured with the entrance without necessarily going into the private part of the house at all. This latter is conveniently contrived, and the planning of the kitchen-floor in the sub-basement is light, lofty, and well arranged. A garden-way is obtained from the staircase hall, as well as from the drawing-room bay, which overlooks the grounds with Mr. Val Prinsep's house in the distance. The other points of the plans, and also the architectural treatment of the elevations, will not require any description, as the drawings explain themselves. Suffice it to say that the walls are of red brick with Yorkshire tiles on the roof, and red-shaped tiles on the upper walls. A fourth studio is obtained on the top-floor overlooking the garden. The gallery, hall, and studios in the house are heated successfully by means of hot-air warmed in the cellar under Mrs. Thornycroft's studio by passing over a hot-water coil, fresh air being admitted on the garden side under the garden steps. The studio in Mr. Barrington's house runs up into the first-floor, as will be seen by reference to the plans.

THE INTERIOR OF AN EXCHANGE—TITE DESIGN.

THIS illustration represents a design for the internal covered area and grand staircase of an exchange. It is intended that it should occupy the centre of a symmetrical block of buildings, and extend from back to front of such a block. It is entered by a large vestibule, besides two side-entrances, which give access to the internal covered cortile, 120ft. square. The grand staircase occupies a prominent projection on the side opposite to the principal entrance. The internal square is covered by a roof divided into nine square compartments, surmounted by circular domical skylights, under which are pendentives, leaving spandrels ornamented with bas-reliefs. The galleries give 16ft. clear passage round, and lead to various grand saloons and apartments, in connection. The grand staircase rises 26ft. from the floor of the cortile to the first floor. Piers are arrayed round the central square landing, to carry a dome. The large surfaces of the staircase walls, and the interior of the dome, are intended to afford a large field for pictorial and other colour decorations.—R. W. COLLIER.

WATERMILLOCK CHURCH.

WATERMILLOCK is a small hamlet on the banks of Ulleswater Lake. The present church was chiefly erected in the early part of this century, and is simply an oblong room, with a so-called steeple at the west end of it. Our illustration shows a design for an entirely new church, adjoining the old one, made in 1877 by Mr. C. J. Ferguson, architect, F.S.A. This, it is now proposed to carry out, with certain modifications, retaining a portion of the walls of the old church to form the nave, and leaving the old steeple for the present. The works will be executed in the most substantial manner, the roofs, seats, and all fittings of oak, the walls of the rubble-stone, quarried from the hill side, with dressings from Penrith Vale. A contract has just been entered into with Mr. Gresenthwaite, of Penrith, for the execution of works for the sum of £1,426.

IN THE TRANSEPTS, ST. GREGORY'S, DOWNSIDE.

THE accompanying illustration gives an interior view of the north transept, and the entrance to the choir, of the new Monastic Church at St. Gregory's Monastery and College, Downside, near Bath. This portion of the building, that is to say, the two transepts and the crossing between them, one bay of the nave and choir and a corresponding portion of the north and south aisles of both, together with the side chapels which stand east and west of the north transept, is being erected and will serve as a temporary church till the nave and choir are fully completed. The nave and choir together will be 210ft. in length by 28ft. in breadth, the total internal length of the church being 270ft. The aisles are continued round the apse, and open into twenty-five chapels that form a crown round the choir and east end of the building. The internal height, from the floor to the apex of the groining, is 65ft. A fine tower and spire 250ft. high is also in course of erection, and stands at the end of the south transept. The church is being built entirely of Bath stone with the exception of the columns of the arcade, which are of Ancaster stone. The groining will be carried out in Bath stone with bands of Ham Hill stone, in the same manner as the groining of the cloisters round the quadrangle already built. The stonework is being executed by Mr. Joseph Bladwell, of Bath, from the designs of Messrs. Dunn and Hansom, architects, of 2, Westminster Chambers, Victoria-street, S.W., and Newcastle-upon-Tyne. We illustrated the interior of the church as proposed to be completed on Oct. 16, 1874; and the whole group of monastic buildings by a perspective on May 30, 1873, and by a bird's-eye view on June 13, 1874.

PORCH, OLD MORETON HALL.

THE porch in the inner quadrangle of old Moreton Hall, near Congleton, Cheshire (at one time the residence of the Thornycrofts), forms part of one of the finest examples of half-timber work in the county. The imposing group of bay windows to the hall, with the ever-varying patterns of lead-glazing, are too well known to need description here. The illustration is from a sketch by Mr. John Belcher, of 5, Adelaide-place, E.C. The hall itself was illustrated in these pages from a drawing by Mr. J. Langham on June 25, 1880, and by a woodcut on July 25, 1879.

COMPETITIONS.

AUCKLAND CEMETERY.—In reply to the advertisement which appeared in our columns, designs were sent in by 27 competitors. At the first meeting of the Board seven designs were selected for further consideration, and at a second meeting on Thursday last, the premiums were awarded to the following competitors:—1st, Mr. J. P. Pritchett, Darlington; 2nd, Mr. F. Brooks, Darlington; 3rd, Mr. R. W. Thompson, Auckland.

BRENTFORD, W.—The local board has received three competitive plans for dealing with the drainage and sewerage of the town. Captain Douglas Galton, C.B., F.R.S., has been appointed referee, at a fee of £50, to report and advise on the plans.

CHIPS.

A new reredos has been placed in the parish church at Heversham, Westmoreland, from designs by Messrs. Paley and Austin, of Lancaster. The work is of polished alabaster, richly moulded and carved, and was executed by Mr. Roddis, of Birmingham.

A carved Caen stone font, with marble columns, has just been supplied to Wimbish church, Saffron Walden. It is the work of Messrs. Jones and Willis, of Birmingham and London.

The parish-church of St. Peter, Mansfield, was reopened by the Bishop of Lincoln on Tuesday week after partial internal restoration. Instead of the chairs by which the old pews were replaced a few years since, oaken benches corresponding with those in the chancel have been erected throughout the nave. Mr. A. H. Potter, of Mansfield, was the honorary architect, and Mr. Tooley, of Bury St. Edmund's, the contractor. The cost has been £600.

Mr. W. A. Heazell, of Nottingham, architect, the arbitrator in the case of Cordon and Morrison, has published his award.

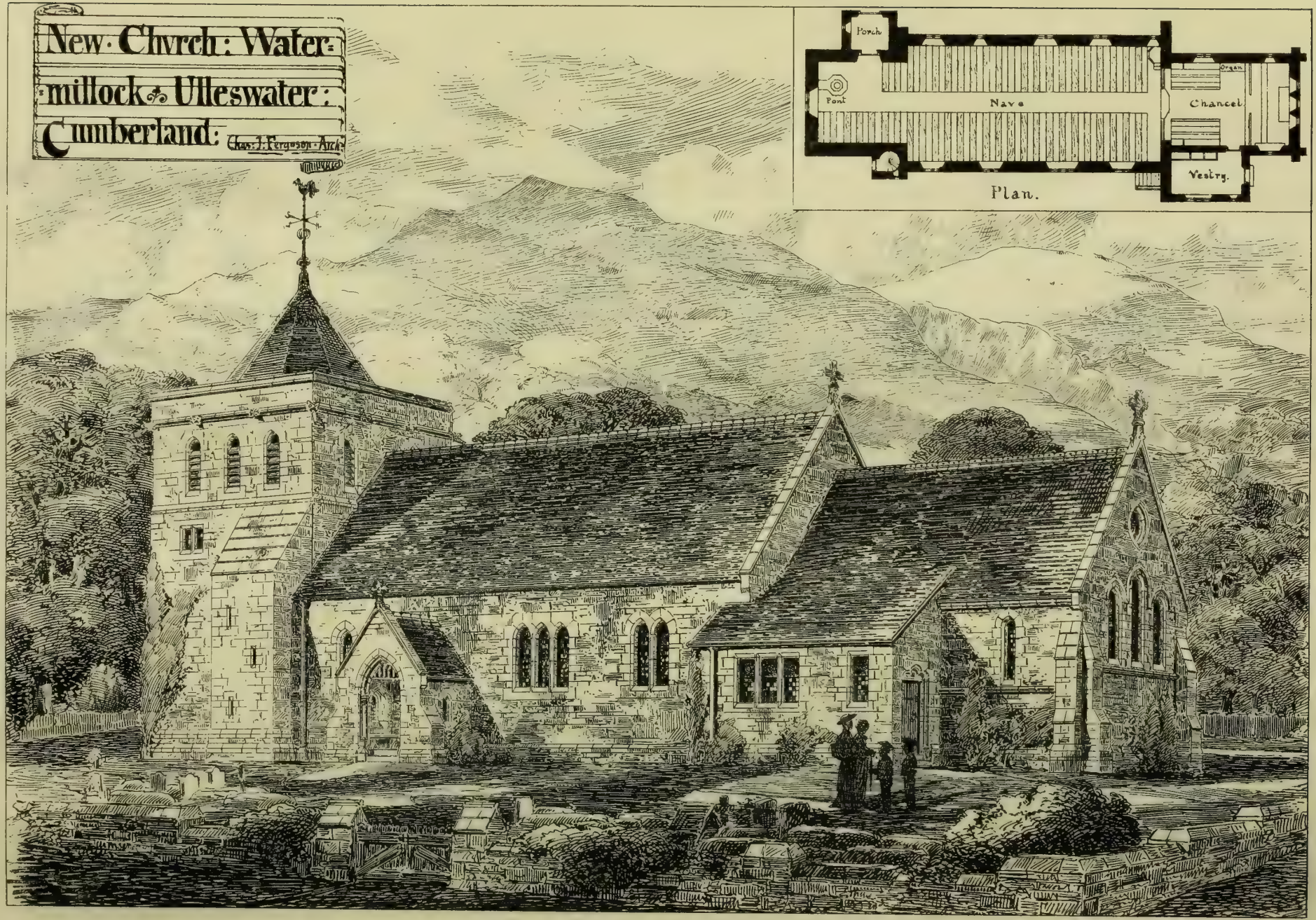
A memorial tablet to the memory of Colonel Talbot A. P. Cox, C.B., of the Buffs, has just been placed in the Warriors' Chapel of Canterbury Cathedral.

The Wandsworth district board of works last week received a report from the general purposes committee, recommending that the salary of the surveyor for the parish of Clapham be increased to £400 per annum from Midsummer next, and that he be required to find his own offices. Protests were made that if anything should go wrong with the surveyor, the board would have no control over their own plans; but the recommendation was adopted.

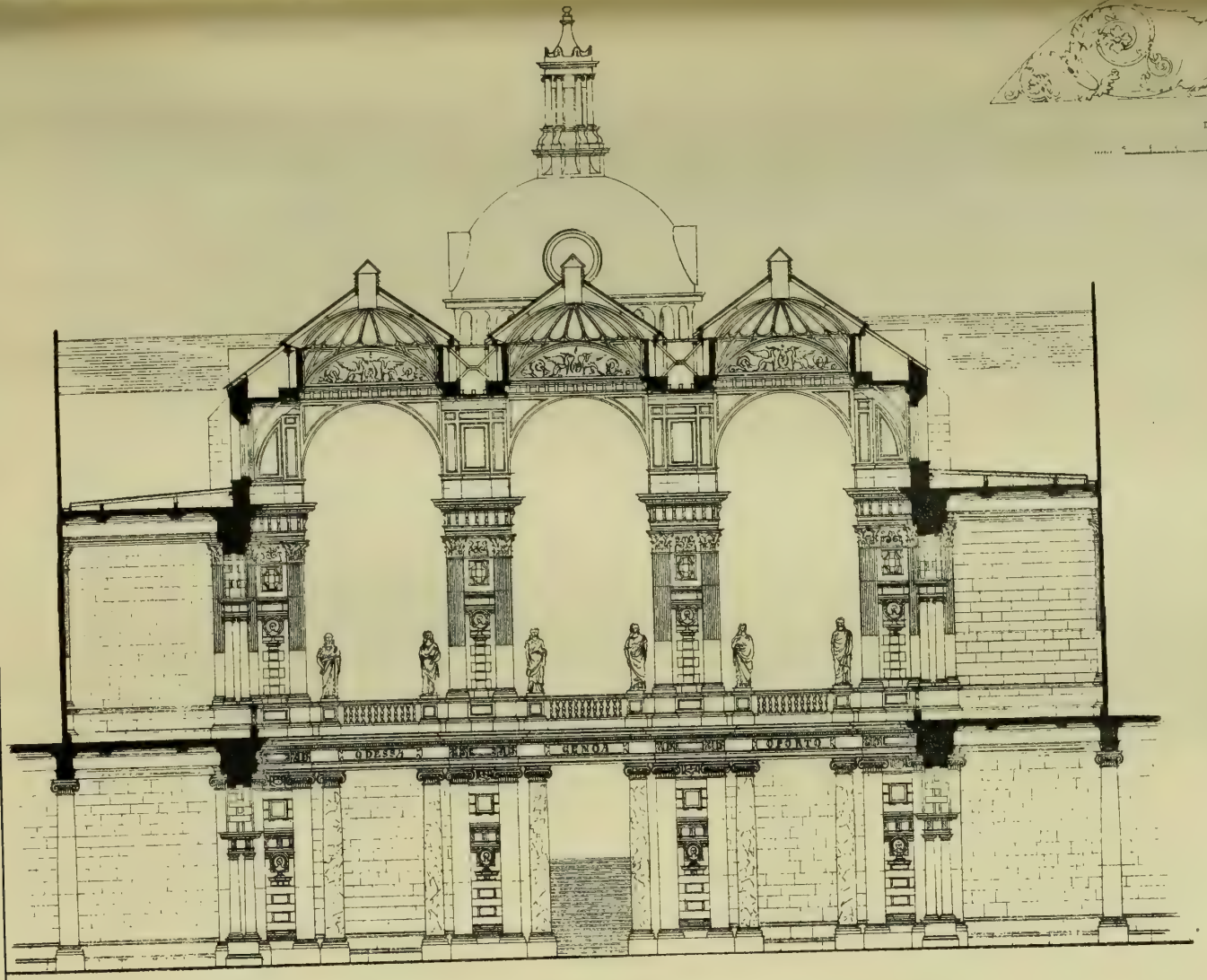
A new post-office is about to be erected at Alloa, N.B., adjoining the municipal buildings in Bank-street. Mr. Frame, of Alloa, is the architect.

The temporary church of St. John the Divine, Bedford-hill-road, Balham, was consecrated on Thursday, the 19th inst. It is of timber framework, covered with corrugated iron, and lined throughout with grooved and tongued match-boarding. Mr. R. J. Withers, of Adam-street, Strand, was the architect, and Mr. Charles Kent, Euston-road, the builder. It seats 230 persons, and cost £385.

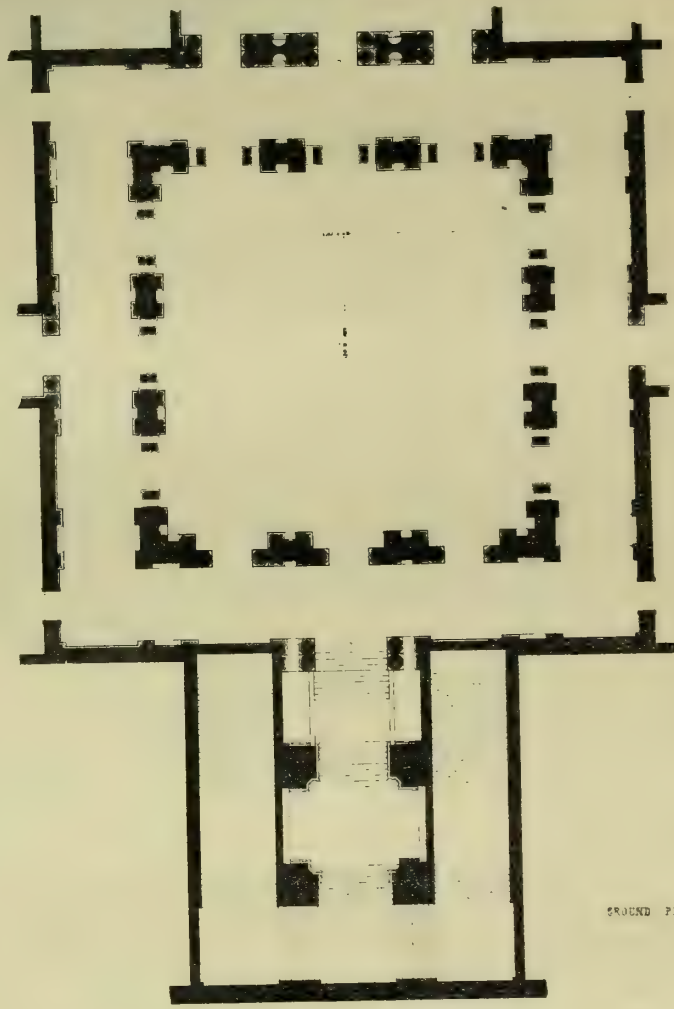
The new Royal Arms Coffee Tavern at Guildford has been opened. The architect was Mr. A. B. Harding, of Guildford, and the clerk of the works Mr. Shaw.


New Church: Water-millock & Ulleswater: Cumberland:
Chas. J. Ferguson Archt.
Porch
Font
Nave
Organ
Chancel
Vestry
Plan.

DETAIL OF ORNAMENTAL SLABS UNDER SKYLIGHTS



SECTION LOOKING TOWARDS GRAND STAIRCASE



GROUND PLAN

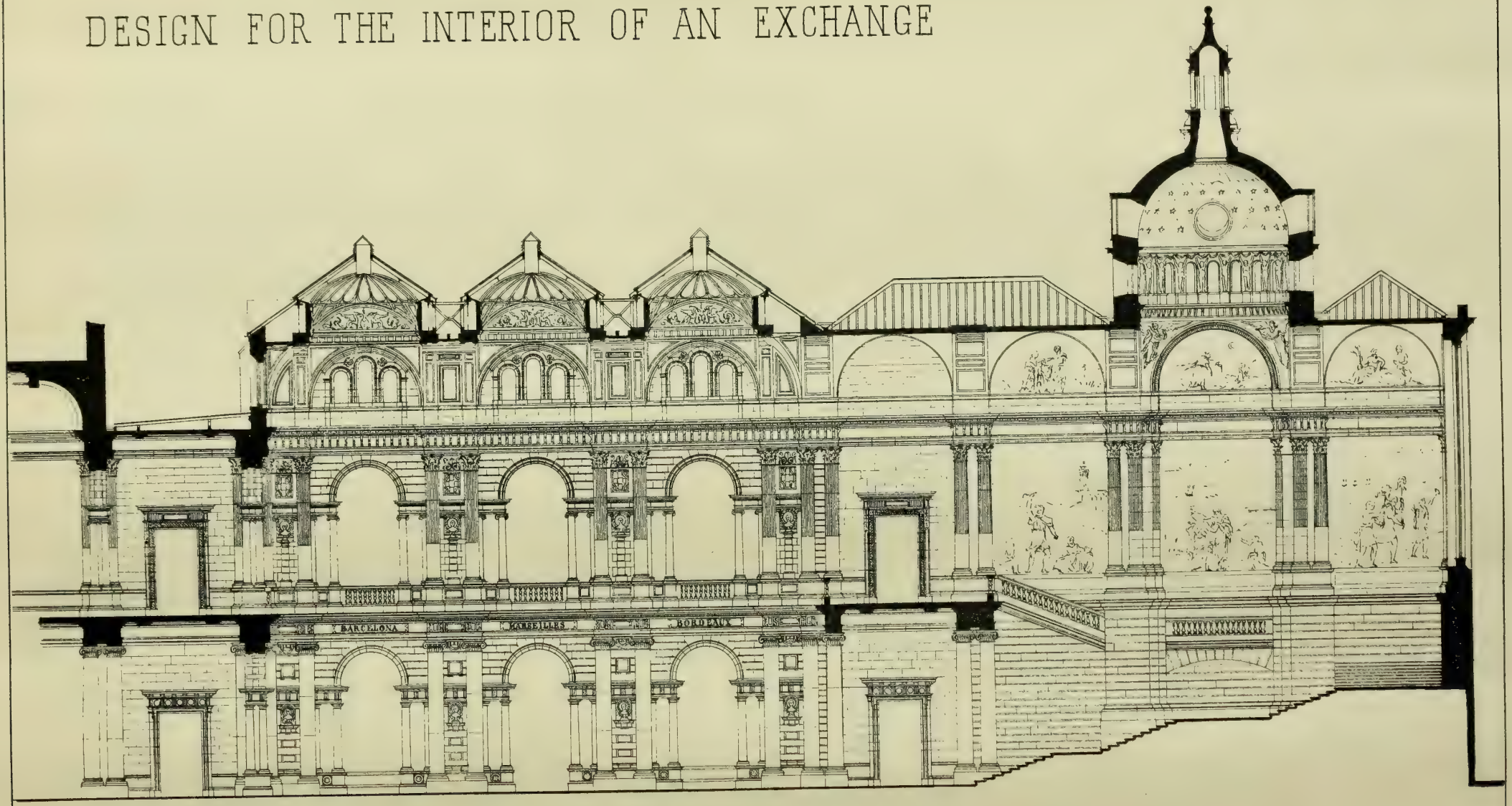
SCALE OF 10 5 0 10 20 30 40 50 60 70 80 90 FEET

R.I.B.A. SIR WILLIAM TITE'S PRIZE FOR 1881 : SELECTED DESIGN

BY R.W.COLLIER.

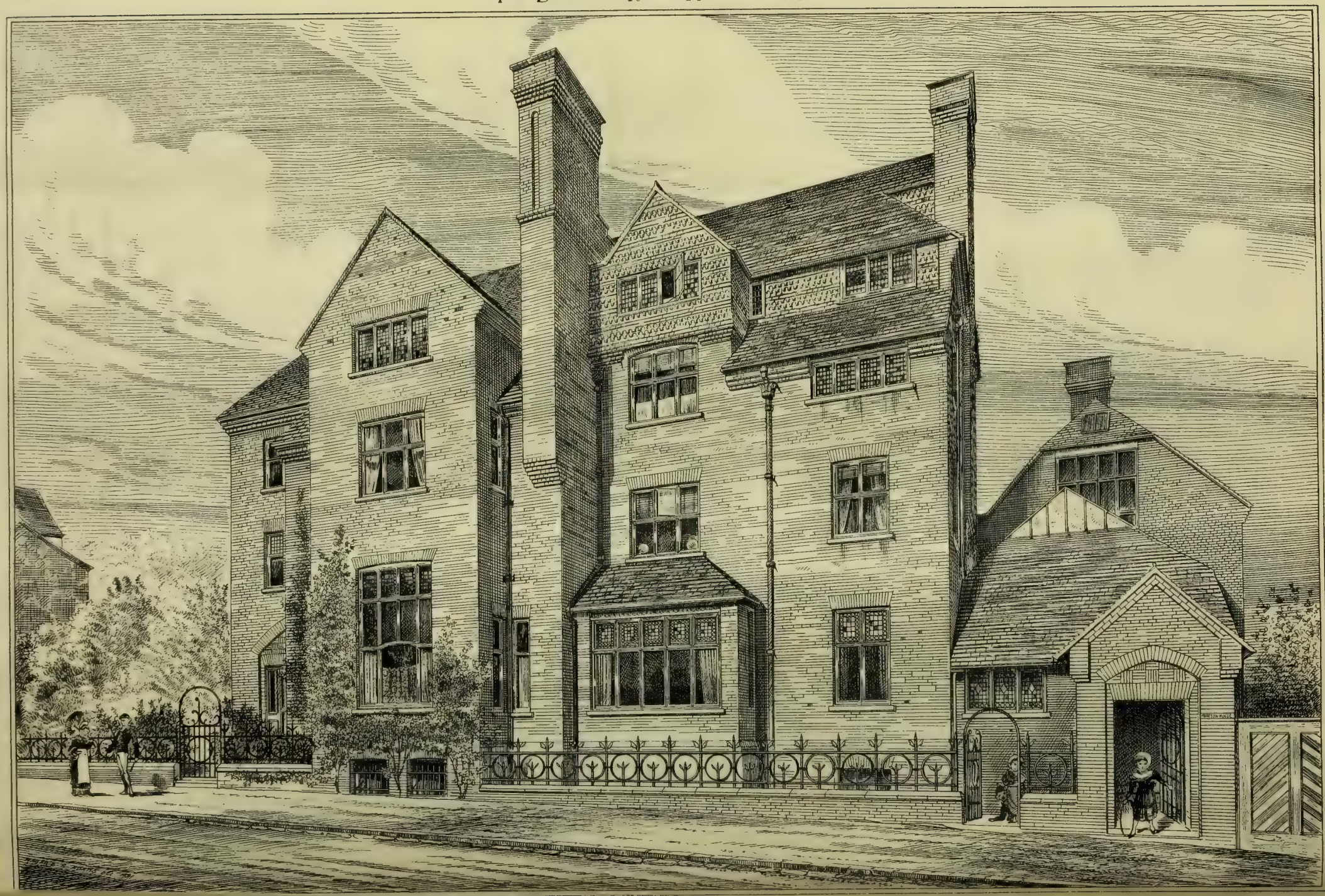
Photo Lithographed & Printed by James Akerman, 6, Queen Square W.C.

DESIGN FOR THE INTERIOR OF AN EXCHANGE



LONGITUDINAL SECTION

Scale of 10 5 0 10 20 30 40 50 60 70 80 90 100 Feet



ARTISTS' HOMES No 5

MR HAMO THORNYCROFT'S

RESIDENCE & STUDIOS

MELBURY ROAD

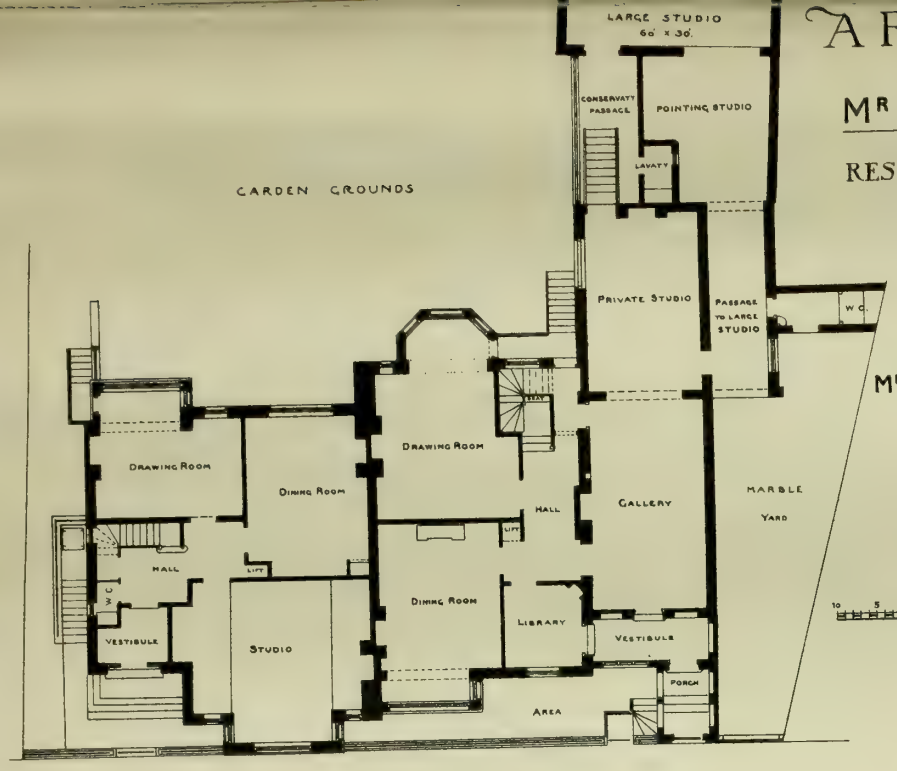
KENSINGTON

ALSO

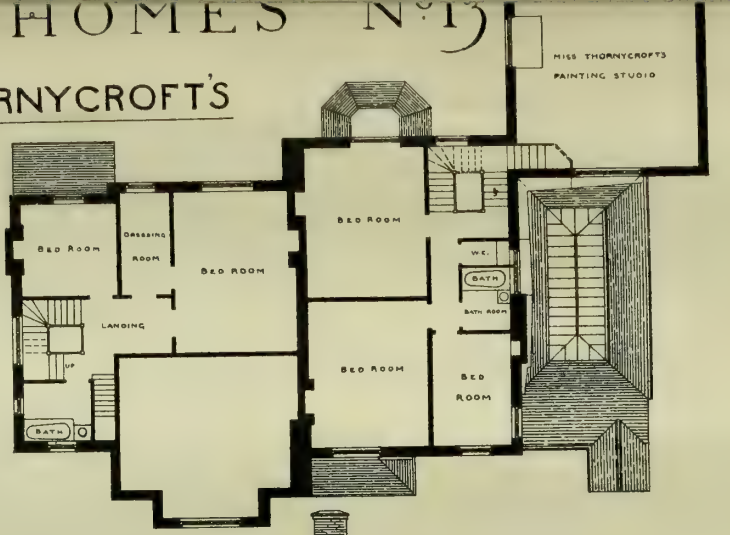
MR RUSSELL BARRINGTON'S

HOUSE

PLANS Etc.



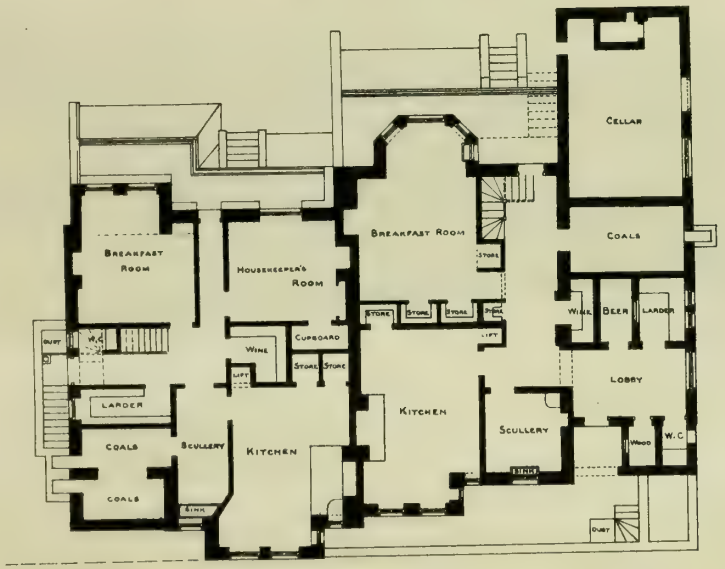
GROUND PLAN



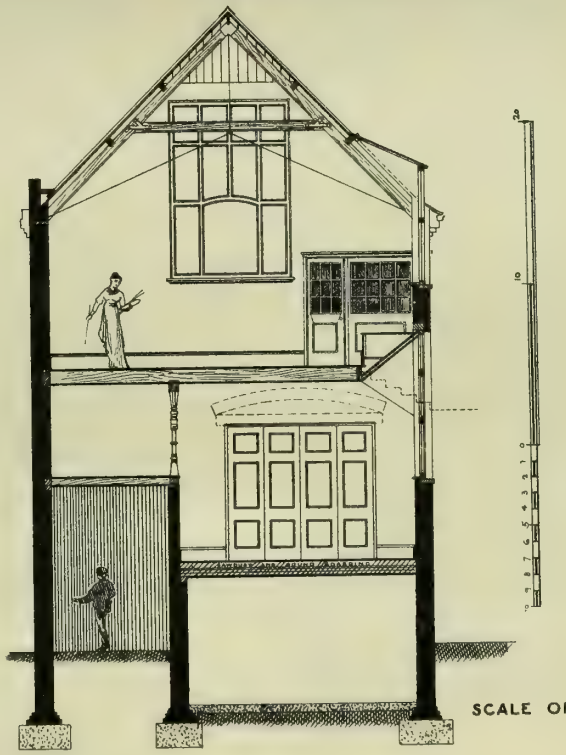
1ST FLOOR

SCALE OF PLANS

10 5 0 10 20 30 40 50 60

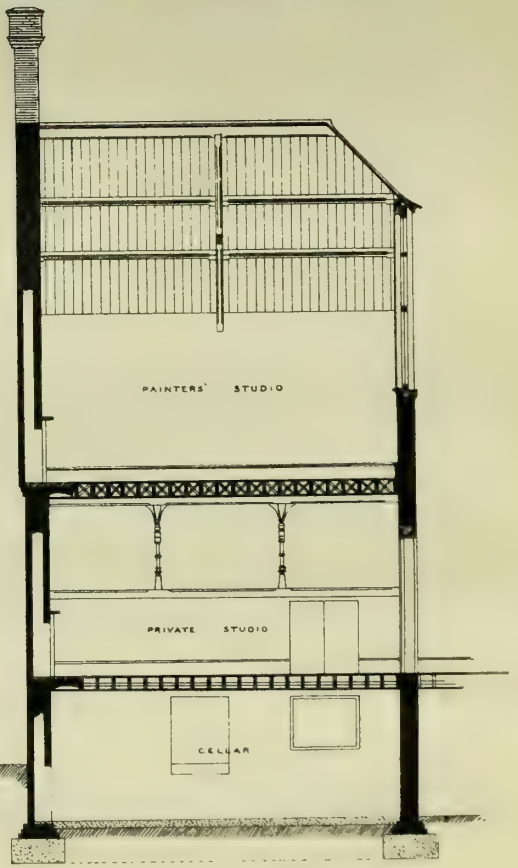


BASEMENT



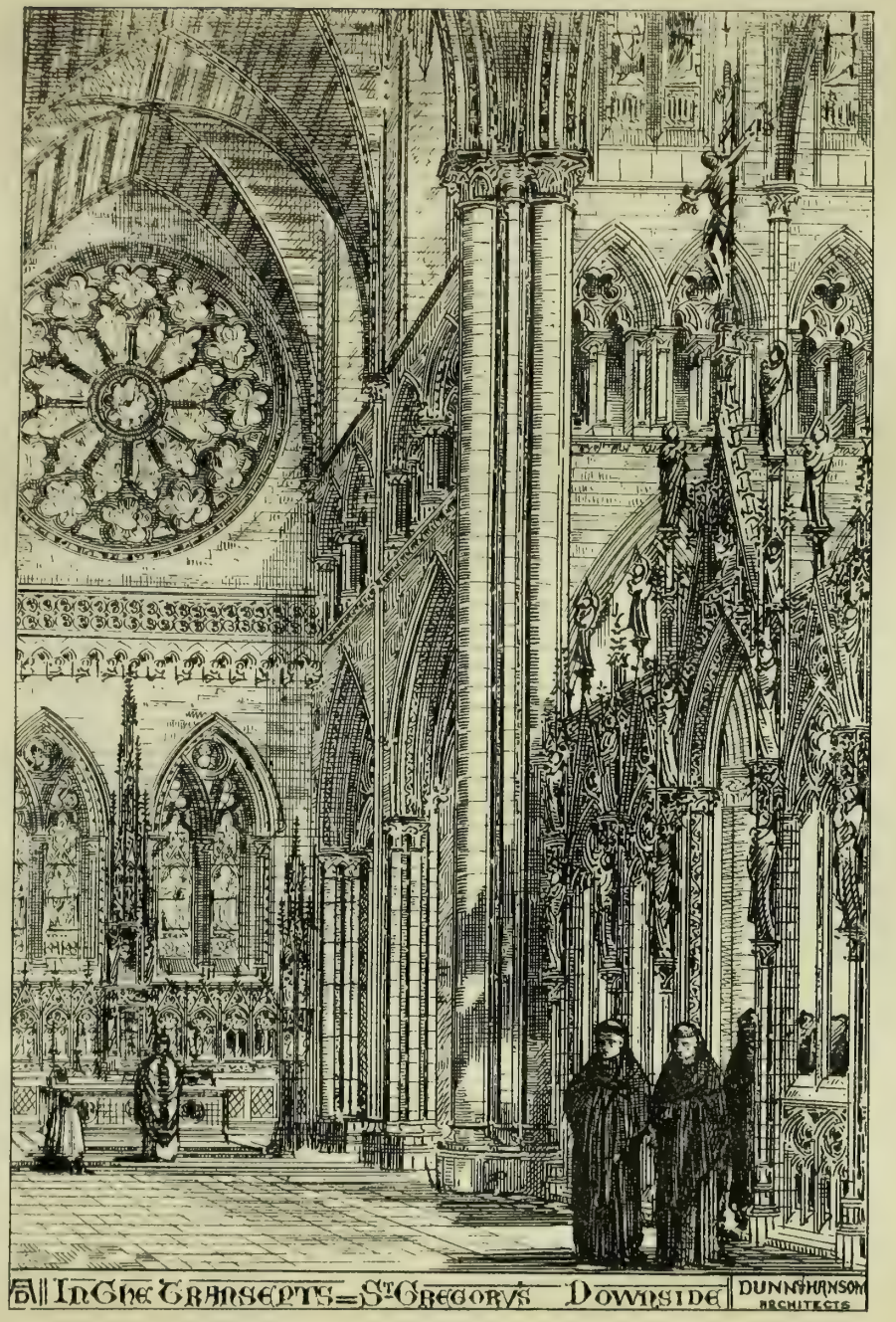
TRANSVERSE SECTION

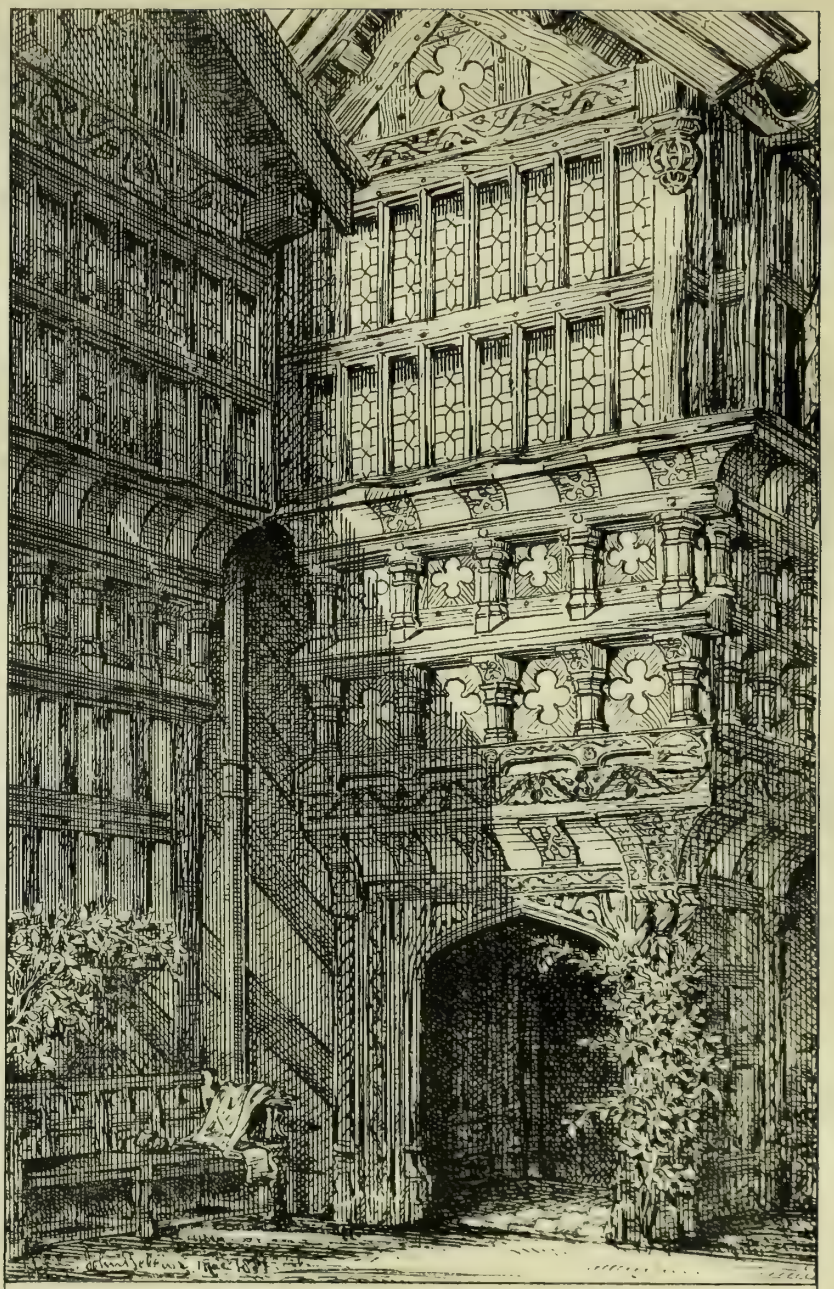
SCALE OF FEET



LONGITUDINAL SECTION

Photo Lithographed & Printed by James Akerman, 6, Queen Square W C





PORCH OLD MORETON HALL.

Photo Lithographed & Printed by James Akerman 6 Queen Square W.C.

THE TOWN AND NEIGHBOURHOOD OF MARLBOROUGH.*

THE Town, College, and Neighbourhood of Marlborough is the title of a little octavo volume writen by F. Edward Hulme, F.L.S., F.S.A., the author of "Principles of Ornamental Art," and other treatises. Mr. Hulme's object is to lay before his readers something about the old town and neighbourhood of Marlborough in Wiltshire, a place of interest to antiquaries, but of which few people know anything. In the past, no doubt Marlborough played an important part among the cities of the West of England, especially when Bath was in its glory, for then it was a stopping-place on the road; during the Civil Wars the town was fortified, and was looked upon as of some importance; it also chose the side of the Parliament in the War between it and Charles I. The antiquary will find much to interest him in the perusal of the historical chapters of Mr. Hulme's pleasant and readable book.

The town, as it exists, is sketched; its railway communication, till lately very bad, has now a prospect of being improved by the completion of the Swindon and Andover Railway. The old town can date back long before the Conquest, and was incorporated by charter in the reign of King John. Its proximity to Salisbury no doubt added much to its former prosperity, while now it is the post and market town of a considerable district. Mr. Hulme gives many incidents connected with the town, and briefly describes the principal churches and buildings. The Guildhall, of Elizabeth's time, was no doubt a fine specimen, but this was demolished, and another built in 1631 was destroyed by fire. A third Town-hall was demolished also, though, from the account given of it, with its steep roof and double row of dormers and pinnacles, it must have resembled, as the author observes, the Guildhall of the Low Countries. An existing picturesque feature is the piazza or "penthouse," as it is locally named, of varying height, with supports of different shapes. It is described in Britton's "Beauties of England and Wales." The Church of St. Mary, with its fine Norman doorway, engraved in this book, and its recently added chancel, by G. E. Street, R.A., is interesting for many late features, and for a rude carving representing a cat with a kitten in its mouth, over the south porch, which carving a local legend ascribes to the maternal devotion she showed in saving her kittens, and sacrificing in so doing her own life in a fire. The past history of Marlborough, and its associations with great events, are treated in the next chapters, which are full of allusions. The sketch of the College, an old brick building of Late Classic character, with various additions, and a chapel designed by the late Edward Blore, will be found of interest. Among the Marlburian scholars we find the authors of "Earthly Paradise" and "Jason," and of "Dame Europa's School;" and the training given has placed it among the higher schools. In the higher school, the education is intended as a preparation for the universities, and science and art form special subjects.

The more generally interesting part of the book describes the local antiquities, such as the Temples of Avebury and Stonehenge; on the west, near West Kennet, the "White Horse," a cutting in the chalk down; Silbury-hill, Tumuli, Preshute Church, Fyfield Church, and various other relics of a past age. The lych-gate of the latter church is a noticeable feature, and the old Norman font is a typical one. Mr. Hulme descants in pleasant manner on the numerous barrows to be found; on the rude stones forming the circles of Avebury; and the illustrations given of these objects make the descriptions more intelligible. The author does not forget to inform his readers of the numerous conjectures formed of the origin of these prehistoric remains, and he dismisses such ideas as that Stonehenge, Avebury, Silbury, &c., were a grand Druidic planetarium, and considers the Silbury-hill to have been a place of interment of some great warrior or prince. Among the illustrations is a good engraving of the font of Avebury Church, a fine cylindrical one with interlacing ornament of Romanesque design. The earthworks; the encampments, dykes, and Roman roads, Savernake Forest and its interesting features are noticed, and the appendices will be found of value to the antiquarian student. The book is well illustrated, and will be found a readable, pleasant handbook to anyone who may chance to spend a holiday in the neighbourhood, and to all local antiquaries.

* The Town, College, and Neighbourhood of Marlborough. By F. Edward Hulme, F.L.S., F.S.A. London: Ed. Stanford, Charing-cross.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

British Archæological Association. — The twelfth meeting of the Session was held last Wednesday, the Rev. S. M. Mayhew in the chair. The further discovery of Roman articles in King's Arms-yard, Southwark, was announced by Mr. R. D. Way. An Ecclesiastical seal, hitherto unpublished, was exhibited by Mr. W. G. Smith, who also contributed a large collection of drawings in Wales. Mr. Loftus Brock, F.S.A., described a mould for casting pilgrims' signs, recently found in Liquorpond-street, and which was for the production of signs of the celebrated Glastonbury Thorn. The Chairman exhibited two remarkable figures in oak, found in London, and several other objects of Saxon and later dates. Mr. C. Sherborn, described a dagger of historic interest, since, from its inscription, it was one of those used by the 25 men who banded themselves together to avenge the murder of Sir Edmondbury Godfrey, in 1678. The appearance of the weapon confirmed the date. Mr. W. Myers, F.S.A., exhibited a large collection of antiquarian objects of considerable beauty and value. Among these were a gold zeif, from Zanzibar, covered with ornamentation very similar to ancient Eastern work, although the article was of late date; a gold statue of Bramah, some Irish ring money of the same material, and which, from the twisted appearance, was probably but the goldsmith's mode of keeping his gold in convenient form for other purposes; a fine series of Egyptian articles, worked cones from Cissbury, and many flint implements from Thebes and from Gourna in the desert—a locality which has not yet been noticed as having yielded these prehistoric evidences of the existence of man. The articles exhibited were brought by Mr. Myers from the localities named, and were described in detail. A paper was then read by Dr. Phené, F.S.A., on certain figures of wood, confessedly of remote antiquity, which have been found in Britain, Brittany, &c., at various periods. The lecturer referred to the importance of the comparison of antiquities found in one country with those from elsewhere, and proceded to point out the remarkable analogy between a wooden figure found at Newton Abbot, 25ft. from the surface, a Bolivian figure found in a serpent mound, and another, also of wood, of Astarte, found in Brittany. Reference was also made to a rude wooden figure of the Virgin, said to have been found on Mont St. Michael, another which is believed to have come over with the Holy House of Loreto, and a third in a convent at Minorca, a well-known Phœnician settlement.

Oxford Architectural Society. — On Saturday, the 14th inst., the members of this Society paid a visit to Yarnton and Cassington Churches. The former is an Early English building, with windows and other insertions of the Perpendicular period, and a tower and Spencer aisle, built in 1611. Early in the present century an Alderman Fletcher, of Oxford, gave to the church an altar-piece of alabaster, found buried in a house at Oxford, and a Perpendicular font from St. Michael's Church, Oxford. The ancient font was afterwards found in a farmhouse, and has now been replaced in the Spencer aisle. In the village, the Manor House, built by Sir Thos. Spencer, was seen, and the members proceded to Cassington Church, a Norman building consecrated ten years before that at Iffley; both were built by members of the De Clinton family, the former by Geoffry, the latter by Henry. The plan of Cassington is singularly like that of Iffley, but the treatment is simpler. On Saturday last, the 21st inst., the Society visited the churches of Stewkley, Wing, and Leighton Buzzard.

A memorial obelisk of blue Aberdeen granite, 12ft. in height, having gold letters on the pedestal, has been erected in Highgate Cemetery over the grave of the novelist, "George Eliot" (Mrs. Cross). Messrs. Macdonald, Field, and Co., of Aberdeen, carried out the work.

Building Intelligence.

Alverdiscott.—Alverdiscott, a small parish not many miles from Barnstaple, boasts of a fine old Perpendicular Gothic church with a western tower. The main body of the church was restored in 1866, but for want of funds the chancel and other parts were not touched. The principal feature in the chancel is the new reredos; it is of stone, and occupies the entire width of the east end of the chancel. A new three-light painted east window has been put up. The artists are Messrs. Shrigley and Hunt, of Lancaster. The chancel-roof has received careful attention. The old-carved pulpit has been lowered advantageously about six inches. At the western end of the north aisle a new three-light window, of Bath stone, has been inserted. The whole of the work has been carried out by Mr. Harry Hems, of Exeter.

Bath.—The new Roman Catholic Church in Julian-road was opened a few days ago. The building is English Gothic of the 14th century, and is constructed of stone inside and out. The roof of the chancel forms a striking feature of the interior, being groined and panelled in pitch-pine, with carved bosses at the intersection of the ribs. Messrs. Dunn and Hansom, of Newcastle-on-Tyne and Westminster, are the architects, and illustrations of their design appeared in the Building News, Feb. 28th, 1879. Mr. Bladwell, of Bath, was the contractor; and the sculpture and carving, which is of a very elaborate description, was executed by Mr. Roddis, of Birmingham. Messrs. Hardman and Co. supplied the metal fittings.

Roehampton.—A new Catholic church, dedicated to St. Joseph, in this pretty suburban village, was solemnly opened, on Sunday last, by the Bishop of Anycla, acting for the Bishop of Southwark. The church is in the Early English style, and is cruciform in plan, having a small tower on the north-east side, the belfry-stage of which is carried up in half-timber work, and is surmounted by a saddle-back roof, with a tall flèche springing from the centre covered with oak shingles. The whole of the exterior of church is in stock-brick, with Bath stone dressings, the roofs being covered with green slates. In the interior, the chancel is separated from the nave by a wrought-iron rood-screen, surmounted by carved and decorated figures, and is provided with handsome oak stalls and desks of Late Decorated character, by Mr. Earp, of Lambeth. The internal woodwork (not of oak) is all painted in subdued tints, intended for further decoration later on. The architect is Mr. Fredk. A. Walters, of 4, Great Queen-street, Westminster, and the contractors, Messrs. Lucas and Son, of St. James's House, Kensington-square.

Durham.—St. Margaret's Church, Durham, was reopened on May 16th, after restoration. It is one of the most ancient in the city, the nave and chancel being of Norman date, the north aisle Early English, but the tower, porches, and clerestory are Perpendicular in character. The north aisle of nave has now been rebuilt to twice its former width; a new north porch erected, having over its doorway a niche with statue of St. Margaret; a new organ-chamber erected on north side of chancel, and the vestry rebuilt. On the south side new windows have been inserted, a new doorway and porch erected, and also new south clerestory. A modern Norman east window, which was filled with glaring glass, has been replaced by a five-light Perpendicular window, with rich tracery, filled with stained glass by Messrs. Burlison and Grylls. All the new work is in the style of the 15th-century, except some of the oak fittings, which are later in character, to correspond with the pews, and all has been specially designed, no book-patterns being introduced. A low oak screen now separates nave from chancel, and a similar screen divides south aisle and sacrarium. The altar is new and of solid oak. All the new roofs are of oak, covered with lead; 121 additional sittings have been provided. Mr. C. Hodgson Fowler, F.S.A., of Durham, was the architect, and Mr. George Bailes, of the same city, the sole contractor. Mr. J. Roddis, of Birmingham, executed the wood-carving. The total cost has been £3,000.

Forfar.—A new church built for St. John's Episcopal congregation was used for worship on

Sunday for the first time. The church has been built according to plans by Mr. R. Rowand Anderson, Edinburgh, and when completed will cost not less than £12,000. The design provides for a spire, but in the meantime it has been built to a height of only 40ft., leaving 123ft. to be added. The nave of the church measures 90ft. by 31ft. There is only one aisle, which is on the west side, and measures 74ft. by 18ft. 9in. The chancel is 42ft. 9in. by 21ft. 4in., while the organ-chamber, which is at the end of the aisle, measures 24ft. by 14ft. The vestry and heating apparatus are below the chancel. The height from the floor to the apex of the nave is 42ft., and the side walls of the nave are 24ft. high. The church is seated for upwards of 600 persons.

Goodleigh.—The church of St. Gregory, at Goodleigh, situated three or four miles north of Barnstaple, is being entirely rebuilt, except the tower. The old church was a Perpendicular edifice, with features of a Decorated character in the chancel. It consisted of nave and south aisle, and these will be in a measure reproduced in the new work, the chancel being lengthened a little, and the vestry enlarged. The roofs of pitch-pine do not follow the old cradle pattern, that of the nave having hammer-beam trusses with carved angels on the ends, and the south aisle a tie-beam roof with ornamental traces and pendants. The church-roof is to be boarded in polygonal form with ribs and bosses. The tower, which is a graceful one, is of the Latest Third Pointed style. The cost of the rebuilding will probably amount to £2,000. The architect is Mr. Ashworth, of Exeter; and the builder Mr. Thomas Garland, of Barnstaple. The freestone-work will be executed by Messrs. Youngs and Son, and the carving in stone and wood by Mr. Pickard, also of Barnstaple.

Great Yarmouth.—New board schools were opened last week at North-end, Great Yarmouth. The style is modified Gothic, and the buildings are of red brick set in dark mortar joint, the architectural effect being obtained by the grouping, and by the introduction of moulded and ornamental brickwork, which has all been specially designed by the architects. The drainage system is complete and efficient, and prior to junction with main sewer the drainage passes through a trapped cesspool, from which (on the school side of trap) a 6in. iron pipe 20ft. in height is placed, with a Banner's cowl at top, so that it will be impossible for sewer-gas to accumulate in or be forced through the school-drains. The schools are heated by Shortland's Manchester grates. Accommodation is provided for 610. The cost is as follows:—Contract account, £3,876; fittings and furniture (about) £150; architect's commission, £210; total, £4,236; cost of site and legal expenses, &c., £1,424; total, £5,660; cost of schools per child, exclusive of site, £6 18s. 10½d.; cost of schools per child, including site, &c., £9 5s. 6¾d. The contractors are Messrs. Beech and Cork for bricklayer's and plasterer's work, &c., and Mr. B. Springall for carpenter's, joiner's, and ironmonger's work; the architects are Messrs. Bottle and Olley.

Harbledown.—The church of St. Michael, at Harbledown, which has been enlarged at a cost of about £3,000, was consecrated on the 3rd inst. The original church, which dates from the 12th century, had a chancel 39ft. by 12ft. 6in., and a nave 39ft. by 22ft. 6in., with south and west doors. The roofs are of framed rafters with the usual tie-beams common throughout the south of England. The nave roof carries a timber bell-cote at the west end. To this simple form of church had been added a transept or aisle projecting at right angles from about the middle of the nave into which it opened. But this arrangement being considered most objectionable, and the accommodation for the parish insufficient, the committee determined to pull down the nave transept, and to build a new nave and chancel on the north side of the church, of larger dimensions than the previous nave and chancel, which will now become respectively nave and chancel aisles to the new work. An arcade of three arches separates the new from the old church. A vestry has been taken out of the east end, and an arch has been pierced from the old to the new chancel. The chancel, like the old one, is Early English, with an Early English triplet for an east window. The church will now accommodate about 450 persons. The architect was Mr. J. P. St. Aubyn, of the Temple, London, and the builder Mr. John Lawson, of Whitstable.

Limerick.—The Roman Catholic Church of St. Michael, Limerick City, is being rebuilt from the designs and under the superintendence of Mr. Morris, a local architect. North and south aisles, each 20ft. wide, are being added on either side of the nave, from which they will be divided by an arcade of polished red granite columns, with carved Portland stone capitals, carrying clerestory of round-headed windows. At the west end of south aisle a baptistery is being added, and three new porches to the west end of nave and to the aisles are being thrown out. Large transepts, and three domical apses, at the eastern end, are also being built; and on east side of south transept will be a belfry, 15ft. square and 80ft. high, to be crowned by a gilded figure of St. Michael. The style of the church is Free Romanesque, and in accordance with it the roofs are kept low, and the ceilings are divided into panels. The floors will be laid with tiles, those in the passages being encaustic. The builders are Messrs. Kennedy, Kenny, and Molloy; and the contract was taken at £7,400; the foundations of the western portion of the church have been laid.

Oldham.—The foundation-stone of a new infants' school was laid at the junction of Stansfield-street and Ernest-street, Coldhurst, Oldham (in connection with the Holy Trinity Church, Coldhurst). The schools are of Gothic architecture, and are to be built of red bricks with stone dressings, the roof to be open-timbered and covered with blue slates. The inside walls will be of pressed bricks with a dado of white glazed bricks surmounted with an ornamental glazed string-course, and will contain the following rooms:—Large schoolroom 60ft. by 24ft.; two classrooms 20ft. by 20ft.; cloak-room and lavatory 18ft. by 11ft. 9in.; main entrance 18ft. by 6ft., leading directly into each classroom and large schoolroom. The whole of the building will be heated with hot water; and the cost will be about £1,400. The school is being built from the designs and under the superintendence of Mr. Alexander Banks, architect, Oldham. Mr. Whitworth Whittaker, of Oldham, is the contractor.

Old Charlton.—New assembly rooms at Old Charlton, Kent, have been erected by Sir Spencer Maryon M. Wilson, Bart., who has given them over to the inhabitants of Charlton for their recreation. The foundation-stone was laid on the 19th of June last by his eldest son. The building is in the Queen Anne style, executed in red brick and Lascelles' patent-stone. It consists of a large hall capable of seating 300 persons in chairs, large platform, two retiring-rooms, &c., in the rear. The cost of the above was £2,175; Mr. William Tamsett, of Charlton, was the builder. The whole of the works was carried out from the designs and under the supervision of Mr. John Rowland, architect, of Plumstead, Kent. The opening of the above rooms was celebrated on Tuesday by a concert under the patronage of Sir Spencer and Lady Wilson, given by the Charlton Glee Club.

Taunton.—The barracks which have been constructed for the 36th Brigade Dopôt, on the site of the old Cavalry Barracks in Mount-street, and on adjacent properties, will be occupied in about a month's time. The buildings are Domestic Gothic in style, and are constructed of red and white bricks, with Bath-stone dressings, and concrete floors. They consist of soldiers' barracks for 240 non-com. officers and men, officers' and married men's quarters, armoury and keep, with water-cisterns in tower above, drill-shed, hospital, and stores. The works have cost £40,000, and have been supervised by Major Crozier, R.C., assisted by the division surveyor, Mr. Thomas Berry. Messrs. Hubbard and Bevan, of Plymouth, were the contractors, Mr. Coles their foreman, and Mr. Hall the resident clerk of works.

York.—On May 9th the Archbishop of York laid the foundation-stone of a new church (St. Lawrence), which is to take the place of the old church which, up to recently, stood without Walmgate Bar, York. Mr. J. G. Hall, of Canterbury, is the architect of the new edifice, which is to cost nearly £5,000, and Mr. Keswick, of York, is the builder. The architecture will be Early English. The church is intended to accommodate 800 worshippers. The tower of the old church, which has stood for over 700 years, is intended to be left as a memorial, and in it a bell will be placed; whilst the ancient Norman porch, which is the most interesting feature in connection with the fabric, will be attached to the tower, and form an entrance on the east side of the church near the vestry.

PARLIAMENTARY NOTES.

Monuments in Westminster Abbey.—Mr. Macdonald, on Friday last, asked the First Commissioner of Works if he would lay a return, in the form of which notice had been given, upon the table of the House, giving an account of all the slabs, memorials, tablets, busts, statuettes, and other monuments that had been erected in Westminster Abbey in recognition of the dead since 1880. Mr. Shaw-Lefevre.—I have no right to call upon the Dean and Chapter for any such return as the hon. member asks for. I have, however, communicated with the Dean on the subject. He informs me that all the information which the hon. member asks far as to the tablets, busts, and monuments which have been erected since 1880 is to be found in published histories of the Abbey, and in a small popular account of it sold outside the Abbey for 1s. If the hon. member prefers to examine these monuments on the spot, the Dean will undertake to show them to him, and to any other members who may accompany him, in the course of half an hour, at any time he will name. With reference to the information required as to the fees, the Dean says that the fees for private monuments vary from £200 for a bust upwards, according to the size of the monument. The fees go entirely to the maintenance of the fabric, and not to the private emolument of the Dean or any other member of the Chapter. He adds that the space in the Abbey is very limited, the honour of a monument being very much coveted, the disfigurement occasioned by disproportionate monuments very incongruous, and the expense of the fabric of the Abbey very great. I would suggest, therefore, to my hon. friend, that, as his motion is blocked by the hon. member for Bridport, he should accept the Dean's offer. He will spend a most delightful half-hour under the guidance of a man who, beyond all his predecessors, has exercised a wise and generous discrimination in offering a place in the Abbey to the memorials of distinguished men. Mr. Macdonald, gave notice that, in order that the estimate should be rejected by the House, he would call the attention of the House to the scandal of selling monuments in such a venerable institution. (Laughter.)

South Kensington Museum.—Mr. Walpole, on Tuesday, in reply to a question put by Mr. Firth as to whether the Trustees of the South Kensington Natural History Museum would restore to the public the facilities for evening attendance originally given, said there was every disposition on the part of the Trustees to keep open the Museum collection as long as they could, but the arrangements were still so imperfect, and the staff of assistants and attendants were so scanty, he was afraid it could not be kept open to a later hour than it was at present. The Trustees, however, would take care that the public should have such facilities for attendance as the circumstances would permit.

CHIPS.

The first section of a new Roman Catholic Church of St. Mary, Star of the Sea, is about to be built in High-street, Hastings, from the designs of Mr. Basil Champneys. Messrs. Bell and Sons, of Cambridge and Saffron Walden, are the builders, and the entire cost of church, school, and club premises will be about £10,000.

We have received some specimens of "Metallic Slates" from the Anglo-American Roofing Co. These metallic roof-coverings are largely used in the United States. They are much lighter than slate, and, we should think, durable.

During the past month new schools have been opened by the London School Board in the following localities:—Beethoven-street and Gloucester-grove, East, in Chelsea district; Duncombe-road, Finsbury; Pope-street, near Eltham; Goodson-road, Deptford; Vicarage-road, Plumstead; Cator-street, Peckham; Manchester-street, Marylebone; Brecknock School, York-road; and Pulteney School, Berwick-street, Oxford-street.

The new Trinity Cemetery at Aberdeen is now being laid out from the plans of Messrs. M'Kelvie and M'Culloch, of Dundee. The area of the site is 930ft. by 350ft., the soil is sandy, and 5,515 grave-spaces will be provided at a cost of £4,000. The contractor for the levelling of ground, building of boundary-wall, and mason's work of the lodge is Mr. Leith, of Cairnery Quarries, and the other contracts are let to local tradesmen. Messrs. Macfarlane, Possil-park, Glasgow, supplied the railings. Mr. Alexander Scott is the inspector of works.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

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N. G. L. (You must apply to the Home Secretary, we believe.)

Correspondence.

ARCHITECTURE AT THE ROYAL ACADEMY.

To the Editor of the BUILDING NEWS.

SIR,—Facts are always more valuable than opinions, however well expressed, and especially is this the case when an attack is made against a privileged and exclusive institution like the Royal Academy of Arts. Ever since one can remember, a continued series of complaints have always been made by the representatives of architecture against the manner in which that art has, from the first, been treated by the authorities now located at Burlington House. Seldom, however, has there been more cause for such a charge than the present occasion. Judged from whatever point of view you will, the selection seems inexplicable, and I fail to discover the rule for preference attributed to the Hanging Committee by "H.M." last week. Theoretically it may be so; but, in point of fact, "pot-luck," to use a common phrase, seems in practice to be the only rule for action.

Preference, we are told, is given to drawings executed by architects themselves. This is not so; for personally I have, in one exhibition, had no less than seventeen drawings bearing my name, made for and exhibited by other architects, while only one of my own designs was on the walls on that occasion; or to take the present exhibition, I know for a fact that at least half the drawings now on the walls are in no sense the exhibitors' own drawings. Again, were those whose works are rejected greater sinners in this respect than their more fortunate brethren? Not so, for we find this year, side by side, with a cross on their backs, down in the cellars below, autograph drawings by Messrs. Arthur Blomfield, Ernest George, J. P. Seddon, J. D. Sedding, T. Graham Jackson, G. A. Audsley, E. C. Lee, and others, all of whom would have a claim to the preference for architects' own drawings, if such a preference received consideration or even existed.

Your first correspondent complains because so few coloured drawings were contributed, and certainly there are but few in the exhibition; but among those sent away this year were pictures of this class by Messrs. Herbert Gribble, C. J. Phipps, J. P. Seddon, E. C. Lee, G. A. Audsley, H. H. Statham, Geo. Trufitt, and others — some of those named having as many as three or four drawings refused, and in neither case any one hung. That pen-and-ink drawings are generally less likely to misrepresent architectural details most people will admit, and I for one quite think that in an exhibition of this kind, line-drawings should outnumber the coloured ones. To please everybody, however, is impossible; but surely the exhibited drawings should on the whole be the best of those submitted. Personally I have found this not to be the case, for often my most successful drawings have been excluded, or, perhaps, refused two or three years running and then hung; while my least-telling views have been accepted offhand. This year again individually my experience bears me out. I sent two drawings: my first, the more important and generally interesting work of the two by far, was refused, and the second, a drawing only sent on the chance of "pot-luck," is well hung. To look beyond myself, I cannot for the life of me by any line of reasoning understand why such architects as Messrs. Graham Jackson, Arthur Blomfield, Ernest George, T. E. Collcutt, J. D. Sedding, J. P. Seddon, Herbert Gribble, E. C. Lee, E. R. Robson, J. J. Stevenson, G. A. Audsley, and W. M. Fawcett, should be refused a place when several poor, uninteresting unsuccessful competition or unexecuted designs by unknown men are well hung. The present exhibition at the Albert Hall, said to be of rejected drawings from the Royal Academy, only makes matters worse, for with the exception of Mr. Fergusson's "Church View," by E. F. C. Clarke, Mr. Statham's "Campanile," and Mr. Trufitt's "Seaside House," the little collection is as bad as it can well be. Of course the authorities at Burlington House will say, "See, these are the rejected: judge for yourselves of the justice of our choice," and so the present unsatisfactory state of things seems likely to be perpetuated. No one who reflects for one moment would send a drawing to any "exhibition of rejected" of this kind, unless he wishes to advertise his "turn out" or "kick out" from the R.A.; and here we see one very good reason why not one of the representative names which I have quoted have found their way from the Burlington House vaults to the top-floor of the Albert Hall. I said the selection of the Academy is inexplicable, and I have given some reasons and facts for such an opinion; but when I come to the way in which the drawings, such as they are, are actually hung, I can hardly express my feelings, for it is said that, owing to Mr. Shaw's illness and staying abroad, Mr. Pearson took the duty and directed the hanging. I can hardly believe it, for, in my opinion, the last-elected R.A. is about the best architect that England at present possesses, and it would be interesting to know if my informants were right?—I am, &c.,

AN OLD TEE SQUARE.

ANOTHER SWEET THING IN COMPETITIONS.

SIR,—The corporation of Halifax are in want of a large slaughtering establishment, and have recently issued proposals for a competition. The required premises to cover a plot of ground 156ft. wide, by an average length of about 405ft., and not to cost more than £7,000 (including architect's commission.) "Provision must be made for slaughtering 60 head of cattle per day, 150 sheep, 30 calves, 50 pigs" (in separate departments), "with a landing-stage for the unloading of animals from railway-trucks, fasting-sheds, yards, lairs for cattle, pens for sheep, calves, and pigs, arranged for the classification and housing of the animals before being slaughtered, and in addition thereto the following accommodation must be provided:—A manager or superintendent's house and office, with a platform, weighing-machine, and all needful out-offices, &c.; a day-room for slaughtermen, with proper out-offices, and necessary conveniences. A diseased meat depôt or inspection-room. Premises for treating separately the blood and gut produced at the abattoirs. A dead-meat market or hanging-shed, with offices for the accommodation of wholesale butchers. A boiler-house with a 30 horse-power steam-boiler, with necessary fittings and coal store." . . . . "All the premises are to be fitted with hot and cold water services throughout, and also with . . . ." machinery for loading, hoisting, and what-not. Complete drawings seen, even to roof-plans, together with full specification, are called for. The value of *each* set of drawings and specification by a competent architect being, at the usual rate, 2½ per cent.; *without* quantities or tender, the corporation promise to pay for *one* such set, apparently *with* quantities and tender, the enormous sum of two-sevenths that value, and for one other set one-seventh, subject to condition as to cost. The decision is to rest with the wisdom of the corporation, and the two partly-paid-for designs are to become its "absolute property," and if the author of either of them be employed it will be "on such terms as may be mutually (*sic*) agreed upon." The competition was advertised on the 13th of May; the designs are to be sent in on the 28th! The only sane sentences in the whole sheet of conditions are those which limit the "get-up" of the drawings and forbid perspectives.

Sir, there is only one means of putting a stop to these proposals, which are felt as insults by all honest and self-respecting men, and by their inevitable outcome do more than anything else to bring our profession into disrepute: it is that you should agree to close your columns to them—refuse to insert any competition advertisement whatever—unless the same be introduced by a professional assessor, and accompanied by a copy of approved conditions. Thus, you would stay this many-headed beast without striking a single blow, merely by cutting off the air from it, and would earn the many thanks of many another who is at present like, Sir, your obedient servant,

AN IRATE AND DISGUSTED ARCHITECT.

[Our correspondent's suggestion is an impracticable one. A newspaper has no right to close its advertisement columns to advertisers of whose announcements it disapproves, and if it did other newspapers would be less scrupulous, and nothing would be gained.—Ed.]

THE FIRE IN THE HAYMARKET.

SIR,—Mr. Hurley charges me with making dogmatic, uncalled-for, and infelicitous assertions.

After attempting to show by a formula which was inapplicable to the case, and based on hypotheses which were incorrect, that a stanchion was equal to a safe load of only about two-thirds of the weight it was designed to carry, Mr. Hurley says:—"It would be interesting to know what conduces most to the enormous additional strength, whether it is an extra number of horizontal stiffeners that render it so inordinately compressible."

Whatever meaning Mr. Hurley may have intended to convey by this very ambiguous phrase "inordinately compressible," I think the inference I drew as to its ironical suggestion was not "obviously erroneous," but perfectly natural.—I am, &c.,

THOMAS VERITY.

27, Regent-street, S.W., May 23.

SIR,—Your correspondent, Mr. Hurley, cannot reasonably expect Mr. Verity to withdraw anything after his own "inordinate" remarks. I have carefully read all the letters on the matter referred to, and we are, I am sure, very much indebted to Messrs. Verity and Max am Ende for their letters. Mr. Hurley has, I should imagine, been reading up a few formulæ from Hurst, Molesworth, or other textbooks which do not investigate the principles of scientific construction—only giving results. I would strongly advise him to "adopt" as few formulæ as possible, especially those of an empirical nature, but to rely more on treating cases of construction according to the principles of Applied Mechanics.

My letter on page 532 (ante) bears somewhat on

this matter, and I should myself be very glad of more information on the subject of iron stanchions. I know of no published work that deals in a satisfactory manner with this question.—I am, &c.,
High Barnet, May 23. A. Harland.

CHIPPING NORTON CEMETERY COMPETITION.

Sir,—My attention has been called to the report in your issue of the 13th inst. of some remarks made by Mr. Bruton, Oxford, at the General Conference of Architects, relative to Architectural Competitions, in which he refers to the Chipping Norton Cemetery Competition. His statements being contrary to the facts, I shall feel obliged by your inserting this letter in your next paper. There were only 47 competitors, instead of 70 or 80. The premium was 10 guineas, and not £10. Full specifications were prepared before advertising for tenders, in which detail drawings were referred to. The same were inspected by all the parties who tendered, and a copy was had by the person whose tender was accepted. All the architects who competed were aware that working drawings were to be supplied without further remuneration. Mr. Bruton did not compete, and why he did not do so is best known to himself.—I am, &c., G. H. Saunders,
Chipping Norton, May 17. (Town Clerk).

SANITARY PLUMBING AND PLUMBER'S WORK.—"WHAT IS A PLUMBER?"

Sir,—On the 17th inst. I was present at the lecture delivered by Mr. Stevens Hellyer on the above subject, at the Society of Arts rooms, and as there was not the least opportunity of explaining to the lecturer where he was in error, I am constrained to claim the privilege you usually accord of answering Mr. H. through the medium of your valuable journal.

The lecturer stated that his lecture would be of a practical nature, hence the attendance of about 500 plumbers, who were not a little astonished to hear Mr. Hellyer express an opinion that no man should be allowed to carry out sanitary plumbing without being certificated.

Now if Mr. H. were thoroughly acquainted with his subject, he would know that in many of our towns there are men such as he describes who are certificated up to their eyes, and yet do not know how to wipe a joint. Why? Because the examinations are simply a series of theoretical questions that may be learned from a book, and, as in most of these affairs, there does exist such a thing as "kissing by favour." We have consequently many duffers holding certificates. I think this will show that Mr. Hellyer's lecture was "theoretical rather than practical," and I must boldly assert that in the majority of cases non-practical men are unworthy of a certificate, and those who are worthy of it will not work by the hour.

Next, Who are the examiners—are they practicians or theorists? and is it not very probable that many practical men, though not able to answer all the questions, might teach their interrogators many useful points of which they are quite ignorant?

I have been examined as a plumber and answered all the questions put to me; but why? Because I was articled to a civil engineer, but ultimately adopted the plumbing trade, for learning which I paid in the usual way. The examination, by the bye, was all paper-work, or, in other words, a series of theoretical questions. I also hold certificates for geometry, chemistry, light, heat, sound, steam, Pitman's shorthand, campanology (Cumberland Youths), &c., besides two medals for the plumbing trade. Put me in practice for any of these, excepting plumbing and Pitman's shorthand, and I should prove a rank outsider. So much for certificates.

When a plumber calls or styles himself a sanitary engineer, it is all nonsense, inasmuch as a plumber (strictly speaking), whether he be sanitary or otherwise, has no use for engineering skill. It cannot be said because he knows how to ventilate a soil-pipe, dig or cleanse a drain or cesspool, or other such dirty work, that he is an engineer; therefore I say that "sanitary engineer" is a title to be discarded by all plumbers, and used only by such men as Mr. Baldwin Latham and Mr. Ernest Turner, for whom I am pleased to say I am doing a great quantity of work. Fancy the Board of Trade calling in a sanitary engineer (at present so-called) to repair a leaden pipe, and comparing this self-styled sanitary joker with the above-named gentlemen. No wonder they prefer to put C.E. at the end of their names instead of S.E.

The lecturer also complains that our trade societies do little or nothing to advance technical knowledge. Now in answer to this I must tell Mr. H. that the society has, and is still doing, much work in that direction, and, further, that we have the picked men of the world enrolled in it (though he is not one of us), and are so particular as to whom we enrol that no man is admitted unless introduced and seconded by members with whom he has worked, and who can vouch for his ability and eligibility, and should he not prove up to the standard, not only is he expelled, but those who introduced him are also suspended for 12 months.

Is it not also a boon to master and man to be able relatively to employ or find employment at almost any time when good work has to be done, no matter what branch of the trade it may be in?

These are some of the advantages connected with our Society of Plumbers.—I am, &c.,
P. J. Davies, Practical Plumber (or if I must be an engineer), Certificated Civil Engineer.

THE EXHIBITION AT THE ALBERT HALL.

Sir,—May I, as a casual observer and a lover of fair-play, be allowed to point out some inaccuracies in your article on the Exhibition at the Royal Albert Hall. With reference to your criticism on No. 545 (Interior of St. John's, Kennington, a church I know thoroughly well), I think your correspondent is at fault. He says that Mr. Childs has taken his view from the easternmost bay of the church. Now, if he had thoroughly examined it, he would not have said this; he says also that the arches were too pointed. Mr. Childs includes the easternmost bay and part of the next one in his picture, so it is very clear that he has not done, or it would not be in the view. Again, if your correspondent knew the church, he would know that the easternmost bay is much narrower than the other, but the arch is of an equal height, therefore, the point is very sharp indeed. The eastern bay, too, is canted, and thus it alters the perspective.

One of the best drawings he totally ignores, that of the "House of Mercy, Kilburn." It is not very large, but I think it a most excellent drawing.

There are many other minor errors, but I will not trouble you with them.—I am, &c.,
May 24. Fair Play.

BUILDERS AS ARCHITECTS.

Sir,—In Hamilton-place, Hyde-park, there is in progress a large mansion. It is being erected by a firm of builders, who are, I am informed, their own architects, and that other important works are being carried out under the same conditions.

This I cannot but think is a strange and most objectionable practice.

Why should builders encroach in this impudent manner on the province of architects? How an architect would be abused if he attempted to carry out as a builder his own design!

Can such system have aught but disadvantage for the client both as regards cost and design?

The attention of architects should be given to this matter.—I am, &c., M.

SANITARY ARRANGEMENTS OF LONDON MIDDLE-CLASS HOUSES.

Sir,—Many provincial architects who, with myself, have read with interest in your columns the reports which from time to time appear of lectures, discussions, papers, and conferences upon sanitary matters, are suitably impressed with the ever-growing public attention which these things receive in the metropolis. We are of course accustomed to look to London for "light and leading," and you will therefore judge of the painful surprise which accompanied my inspection of a house in one of your populous northern suburbs, under the following circumstances:—A family, about taking a lease of a newly erected and highly recommended house, requested me to approve the sanitary condition. The house is one of about 25, letting at £70 per annum, all identical in plan, and built under the superintendence of an architect and with the approval of the public authority. In all these houses the servants' w.c. is inside the building, with neither light nor air, and with no power to obtain either. The bath waste communicates directly with the drain, and the main soil-pipe, which is well within the house, is unventilated. As a climax the sink-waste is adroitly conducted into the ventilating aperture of the stoneware w.c. trap. Many other defects exist; but these are sufficient to show that at Brighton, where such errors would be fatal, to the passing of our plans by the town council, we are at any rate in some respects abreast of you in ordinary sanitary skill and care.—I am, &c.
Brighton, May 25. Charles E. Clayton.

TESTS OF LASCELLES' CONCRETE.

Sir,—Thank you very much for your notice. There are two errors which I should be glad to rectify. In David Kirkcaldy's tests "Dec. 15th, 1860," should be "Dec. 15th, 1880," and in each case where "breeze" is mentioned, the words "and clinker" should be added in the same table of tests. W. H. Lascelles.
121, Bunhill-row, E.C.

CHIPS.

The foundation stone of a new Wesleyan chapel was laid at South-parade, Grimsby, on the 10th inst. Mr. C. Bell, of London, is the architect.

A new church at the Brents, Preston-next-Faversham, was consecrated on Saturday week. It is built at the sole cost of Mrs. Hall, as a memorial of her late husband, and seats 260 persons. Messrs. Kirk and Son, of Sleaford, were the architects, and Messrs. R. M. and H. Whiting, of Ospringe, Kent, the builders. The east window is filled with stained glass, the subjects being taken from the incidents of the Passion and the later events in our Saviour's Life. It was designed and executed by Mr. Preedy, of 15, York-place, Portman-square, W.

The Heston and Isleworth local board proceeded last week to elect a surveyor, vice C. Crawshay, now imprisoned for embezzlement, and Mr. Bromley, of Westbourne-park, W., was elected by a majority of a single vote over Mr. Laffin, of Croydon. There were 40 applicants for the appointment, to which is attached a salary of £200 a year.

A surveyor, named Frederick Soames, pleaded guilty at the assizes recently held at Ipswich to two indictments of forging and uttering orders for payment, and was sentenced to sixteen months' imprisonment with hard labour.

The memorial-stone of a new Congregational church was laid at Turnham-green, on Wednesday week. The chapel will be Early English in style; Mr. Lewis Banks is the architect, and Mr. Brunsden the contractor. The cost will be about £3,200.

The castle of Fyvie, N.B., the seat of Captain Gordon, has just been renovated under the direction of Messrs. Mackenzie and Macmillan, architects, of Aberdeen. The harling has been stripped from the red sandstone walls, where they were worn, have been "patched with cement and painted and so restored to their original beauty,"—in the judgment of the writer of an article in the *Aberdeen Journal*.

At the meeting of the West Kent main sewerage board, held last week, a report was received from the engineers, stating that the extension of the sewer into Beckenham had been completed at a cost of £35,567 11s. This was £3,269 less than the contract sum, as it had been found possible to reduce the thickness of the tunnel through Stumps-hill, and also to economise in other portions of the work. Messrs. Mowlem and Co., of London, were the contractors.

Foundation-stones were laid on May 13 of a new Bible Christian chapel, in the hamlet of Kennard's House, Launceston. The style is Romanesque, with round-headed windows; pitch-pine benches will seat some 80 worshippers, at a total cost of £300. Mr. E. P. Wise, of Launceston, is the architect, and Messrs. Lintern and Rich, of Lifton, are the builders.

An oak lectern-stand, handsomely carved, with brass railings, has been recently placed in Worcester Cathedral, in memory of the late Dean. The work is by Messrs. Jones and Willis, of Birmingham and London.

The new church of All Souls at Bolton-le-Moors will be consecrated by the Bishop of Manchester on the 30th prox. The style of the building is Transitional between Decorated and Perpendicular; the cost has been £21,000, and 800 sittings have been provided. Messrs. Paley and Austin, of Lancaster, are the architects.

A chapel is about to be built in Grafton-square, Clapham, from the designs of Mr. W. Niven.

A new collar-factory, which will accommodate 400 hands, has just been built at Taunton for Mr. R. M. Moody. The building is 120ft. by 60ft., and two stories in height, except the ironing-room, which is one story high and covered with Rendle's patent glazing. The walls are of white brick, with freestone dressings. The architect is Mr. C. Samson; the contractors are Messrs. Dinham and Verrier, and the machinery has been constructed by Messrs. Bradford, of London.

Intercommunication.

QUESTIONS.

[6511.]—**Canada.**—Could any reader of the BUILDING NEWS tell me if there is an opening for young architects in Canada? I hear that a great railway is being made, and that there will be villages built all along it. If so, there will be plenty of building. Any information on the subject will be very acceptable. If no opening for architects, what other employment?—GLASGOW.

[6512.]—**Metal Railing on Marble Monument.**—I am erecting a marble monument, and wish to insert a metal railing into the base surrounding it. I am told that the ordinary iron railing will rust and discolour the marble. Would it answer better if galvanised? or what other metal would prevent the discolouration? Bronze is recommended, but is this certain not to affect the marble? —J. H. B.

[6513.]—**Air and Light.**—A. has a freehold house that was built seven years ago, and now B. is desirous of erecting a building on adjoining plot of ground and extending backwards considerably further than A.'s. Such a building would materially affect A.'s light to all the windows at the back of his house. Can anyone tell me whether A. can prevent B. building this wall beyond a certain height, and what angle of light A. can claim (if any) to his ground-floor window? If B.'s building be erected, the width of open space between same and A.'s wall will be but 6ft.—M.

[6514.]—**Beams for Lighted Candles.**—The corbels for a beam placed across a church for the support of lighted candles are seen in the opposite windows in the chancel of South Hayling Church. I should like to know if similar beams are observed in other examples, and where?—G. H. G.

[6515.]—**Instrument for Measuring Internal and External Angles.**—Is there any instrument made by which angles, internal and external, may be accurately measured? An architect, in taking plans of old buildings, frequently discovers an obtuse or acute angle which it is of importance to take accurately and expeditiously. Without an instrument he is obliged to resort to the usual method of taking two sides and a cross measurement, or if this cannot be readily done, to take several dimensions, for the purpose of determining the angle.—G. H. G.

[6516.]—**External Stucco-Work.**—Will some reader of the BUILDING NEWS kindly give information as to the best and most artistic mode of treating external stucco work, with a description of the manner in which impressed work is done, what materials are required for the same, and where to be obtained? Also, as to how the building corners should be finished, and what colour the stucco left?—INQUIRER.

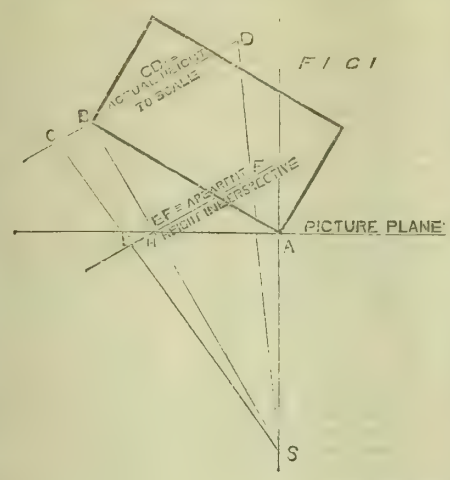
[6517.]—**Stone.**—Will some one kindly inform me what is the best stone found near the Lake District (Westmoreland) that could be used for external dressings, and give a brief description of same; and if this would not also be suitable for internal facing, what other stone would be? Would they be cheaper than Bath or any other largely-used stone not found in neighbourhood? —A. B. C.

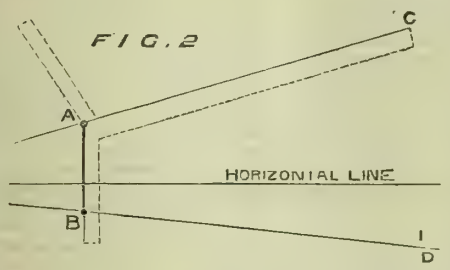
[6518.]—**Local Surveyors' Powers**—A young man, an architect, buys four adjoining plots of building land in a field on the road side, each, however, independent of the other. No street is to be cut nor any new sewer laid. He purposes selling again separately, but when he disposes of one and submits a plan of a house for it, the surveyor to the sanitary authority refuses to consider it, unless he knows what is to be put upon the other plots. This the architect is not prepared to do, not knowing what they may be required for, and an appeal is made to the sanitary authority (a sub-division of the Board of Guardians). The result is the plans are passed, but he subsequently finds that the surveyor is empowered to reject plans unless he himself is satisfied they are complete, so that he becomes absolute dictator, and the difficulty and dispute will be reopened. Would some of your readers conversant with the law say whether the sanitary authority can legally act in this way? I may also say that during the appeal made by the architect, one of the Committee, when shown that no by-law supported them, said, "Oh, but we can pass a resolution."—JAS. MURCHISON.

[6519.]—**Appraiser's Licence.**—Is it necessary for an architect to have an appraiser's licence in order to give an estimate for the cost of a building before arbitrators, or to measure and value work done by a contractor, such as extras, &c.?—J. T.

REPLIES.

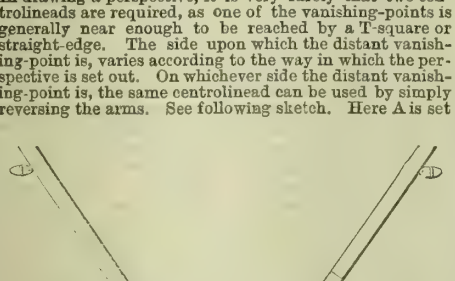
[6475.]—**Advantages of Centrolineads.**—With regard to the advantages of centrolineads, there is but little gain if you cannot find two lines converging to the vanishing point without first fixing that in what is sometimes an all but inaccessible position. To do this it is only necessary to treat the section of the building vertically in the same manner as you do the plan—viz., set out the plan in the usual way, finding the picture plane and station point as in the annexed sketch. Diagram No. 1, where S is the station point; the quoin A being on the picture plane, can be measured by scale simply, and having a vertical line showing the position of quoin B, all that is required to find the two converging lines required is its height. The height is not particular, but must be the greatest height of the building at least. To get this height, draw on the plan the line B S, tending to the station point, and through the point B, the line C D at right angles to B S. Set off on C D the same height as you have scaled on quoin A, indicated by the points C and D. Join C S and D S and through the point H, where B S cuts the picture plane, draw E F, cutting the lines C S and D S in the points E and F, then with the point H on the horizontal line set off the heights E and F, and you have the extremities of quoin B. Now join these points with the corresponding points on quoin A, and the required converging lines are found. Having got these lines, nothing is easier than setting the instrument. Choose your points, which must be in these lines, say, A and B in diagram No 2, and fix the studs in them. Join A B. Now set the instrument so that the straight edge coincides with the converging line A C, and set the lower





leg to the line A B, clamp it there, then shift the straight edge to the line B D, and set the upper leg to A B. The instrument is then set without having recourse to Mr. Drew's dodging method at all.—A. J. MCGLOUGHLIN.

[6475.]—**Advantages of Centrolineads.**—In drawing a perspective, it is very rarely that two centrolineads are required, as one of the vanishing-points is generally near enough to be reached by a T-square or straight-edge. The side upon which the distant vanishing-point is, varies according to the way in which the perspective is set out. On whichever side the distant vanishing-point is, the same centrolinead can be used by simply reversing the arms. See following sketch. Here A is set



for use for the left hand, and B for the right hand. Hugh McLachlan says that supposing the arms can be reversed, he believes the brass threads of the screws must be either injured, or, perchance, will not fit the holes or slots not corresponding exactly enough when altered. Now, if this is the result that Hugh McLachlan has arrived at, after carefully considering the subject, all I have to say is that his centrolinead must be of an original manufacture. He had far better go to Stanley's and buy a more modern invention, then experiment upon it, and afterwards I should be glad to hear the result.—W. M.

[6487.]—**Valuation of Property.**—If "Young Valuer" consults Mr. Banister Fletcher's book called "Compensations," he will find the information he requires.—W.

[6489.]—**Examination in Building Line and Architecture.**—Hugh McLachlan seems to sympathise with "Builder and Architect." Probably he is a chip of the same block himself. It is, certainly, no disgrace to any man if he has worked his way up knee deep in deal shavings until he finds a chance to set up as an architect. But the disgraceful thing is this: When a man deliberately styles himself builder and architect; and if Hugh McLachlan examines the rules of the Institute, he will see that there are strict rules laid down to prevent such men being elected as members. I am quite aware of the fact that there are many in this country who style themselves builder and architect (would that there were not), foremost of whom our jerry builder is a good type. "G. H. G." seems to agree with me, for he says, speaking of "Builder and Architect," he had better first make up his mind which of these businesses he is desirous of following, before he talks about examinations.—W. M.

[6489.]—**Examination in Building Line and Architecture.**—Yes, architecture and building are separate businesses. Nothing proves this, in my mind, so much as the little which builders generally know of architecture. But would it not be better if builders did know something of architecture? As it is, they are often called upon to be architect and builder combined, for alterations and small undertakings that is to say. This probably arises from their employer not considering it "worth while" to call in an architect, or, perhaps, which I am afraid too often happens, because they begrudge the architect's commission; but when that is the case they generally pay pretty dearly, in more ways than one.—CHARLES F. MOXON.

[6490.]—**Lincolnshire.**—"A. R. I. B. A." would find it very difficult to include all the places mentioned by Hugh McLachlan in a ten days' sketching trip. The best churches in South Lincolnshire are easily accessible by following the railway from Lincoln to Sleaford, Boston, Spalding, and Lynn, and naturally divide themselves into groups, as follows, any one of which would afford ample material for a short trip:—1. From Lincoln to Canwick, Waddington, Harmstone, Coleby, Ravenby, Wellbourn, Wellingore, Leadenham, Fulbeck, and Caythorpe. By deviating from this line at Leadenham, he might include Brant Broughton, Beckingham, and Claypole, but it would probably be better to visit these from Newark, with Southwell and Hawton. 2. From Sleaford to Silk Willoughby, Osburnby, Threckingham, Billingborough, Horbling, Swayton, Helpringham, Heckington, Ewerby, Donington, Swineshead, to Boston. 3. From Spalding to Weston, Moulton, Whaplode, Holbeach, Fleet, Gedney, and Long Sutton, where we come to the fine series of churches of the Marshland. 4. Crowland Abbey, Thorney (Cambs.), the Deepings, and Stamford could be taken with Peterborough. I have said nothing of the north of Lincolnshire, for the notable places are much further apart, and the district, therefore, less suitable for a short tour.—ANOTHER A.R.I.B.A.

[6493.]—**Hoop-Iron Bond.**—Hoop-iron bond should have the two courses above and below built in Portland cement, in addition to being laid in cement, and not in mortar. Portland cement is used by some shipbuilders as a coating to preserve the iron girders. There have been many failures of hoop-iron bond through the omission of Portland cement; among many I can mention, in particular, the Deal Gas Works.—A. VOGUELIN.

[6495.]—**Vegetation on Stone.**—When Hugh McLachlan's dodge fails, if you still wish to preserve both the tree and tombstone, you had better erect an awning over the latter.—W. M.

[6504.]—**Strength of Cement Concrete Beams.**—I do not know of any collected data for the purposes of calculation. The following experiments collected from different sources may prove useful; A block of concrete 3ft. long, 11in. deep, and 4½in. thick, was tested at the rooms of the Architectural Association on December 6, 1867, and bore 36cwt. without breaking.—*Builder*, Jan. 18, 1868. Mr. J. Tall, several years ago, had three beams constructed for testing, each 9ft. long, 1ft. 9in. deep, and 9in. thick. No 1 was built by a bricklayer of best hard picked stocks, best lime of the freshest quality, and well-washed river sand. No. 2 was of 7 parts river ballast, and 1 part cement, packed with flat pieces of stone and old bricks. No. 3 was of concrete, without the packing in No. 2. After they had been made ten days, they were broken in the presence of the Surveyor of the Peabody Buildings. No. 1 broke of its own weight; No. 2 required 1 ton 1cwt. 3qrs.; No. 3, 13cwt. 27lb. I consider that beam 1 should have been built in 1 of cement to 2 of sand; no sensible man would think of making a beam of brick in ordinary lime. The comparison between Nos. 2 and 3 is useful, as it shows that concrete with packing will bear half as much again as without it. Another proof in the same direction is found in Viollet-le-Duc's "Dictionary," where, he says, that in a castle over 800 years old, the doors and windows are covered with lintels of stone, and packed concrete. The concrete lintels were used for the larger openings, and we are told that the builders are justified by the experience of time; for whilst the concrete beams are as sound, or perhaps sounder, than when first put up, every one of the stone lintels is cracked or broken. Mr. J. Tall, in a letter to the *Builder* of Nov. 7, 1868, says: "I can show at my factory (built between two party walls of 12ft. span) a beam 2ft. 3in. deep and 6in. thick, packed full of rough Kentish rag, large chippings of flint burs, Yorkshire stone and brickbats, which can be seen on the face, which beam will carry 12 tons (if the walls which form the abutments do not give way.)" From the last clause in brackets I must infer that the test was tried before being permanently fixed. On the District Railway near Gloucester-road station an arch of concrete was built 75ft. span, and only 7ft. 6in. rise. It was 3ft. 6in. deep at the crown, and of a uniform width of 12ft. The materials and proportions were 6 of gravel to 1 of Portland cement, dependence for cohesion being placed on the mixing rather than the ramming. It bore 170 tons equally distributed over the top, and a train of seven trucks weighing 50 tons passed over it. There was no practical deflection. *Builder*, Dec. 26, 1868. Dennett's concrete made with sulphate of lime instead of Portland cement has been subjected to numerous experiments. A beam 9in. by 6in. laid flat with 4ft. span carried 12½cwt. distributed and snapped with 13cwt. On the premises of Messrs. W. and T. Jones, Southwark-street, the arches of 8½ft. span, 12in. rise in soffit, 7½in. thick at crown and 10½in. at haunches bore on a base 4ft. 6in. by 4ft. 3in. a load of pig-iron weighing 6 tons. This gives considering the span 3½ cwt. per ft. super. Other experiments give from 3cwt. 4lb. per ft. super. in a span of 7ft. to 2 1-10cwt. in a span of 10ft. The vaulted dome over the cabinet-room of the New Foreign Offices is only 9in. thick, though of 36ft. span. Prof. Kerr and others consider the Dennett arch after setting to be a beam, having much reason in support of the theory.—HUGH MCLACHLAN.

[6507.]—**The Midland Station Roof, St. Pancras.**—In reply to your correspondent in your "Intercommunication" of last week, I may say that the St. Pancras roof (240ft. span) covers an area of 169,400 square feet within walls, and the cost, completed, was a little over £31 11s. per square.—J. W. C. D.

[6508.]—**Preserving Half-Timber Work.**—Stain the timber with a wash of size and lampblack or size, charcoal and plumbago, afterwards well rub over with bees-wax. Flatted paint also would have no gloss. —HUGH MCLACHLAN.

[6509.]—**Wood Floor.**—Lloyd's patent keyed wood

pavement, supplied by the Wood Pavement Construction and Maintenance Company. The blocks would measure about 6in. by 6in. by 3in., laid on edge, breaking joint with grain on end, a groove being cut in each side. The blocks are laid on a foundation of concrete in rows slightly apart, a grouting of fine concrete being run in between, this fills the grooves and interspaces and when set keys the whole together. Pitch-pine is preferred, and no asphalte or pitch is needed. For upper floors, nail fillets on each side of floor joists, bridge between with small pieces of lathing and cover with mortar as a pugging, after which a 1½in. floor should be laid grooved with iron tongues and splayed headings. Instead of mortar pugging, sawdust might be used, laid on ½in. rough boarding instead of lathing.—Hugh McLachlan.

[6509.]—**Wood Floors.**—For school purposes, I think the best kind of floors to be wood blocks, 9in. × 3in. × 3in., laid in squares of three headers and three stretchers, so that the stretcher squares and header squares work diagonally. They should be burnettised and laid dry on a 6in. screeded bed of fine concrete. In damp localities a 6in. bed of broken bricks, stones, &c., should be laid under the concrete. The wood blocks ought to be cut and stacked loosely in a dry place at least three months, and the concrete ought to be laid at least two months before the floor is laid. To prevent the sound from passing through an ordinary boarded floor, fillets should be nailed along the joists, just above the lower edge, and ¾in. rough boarding nailed to the fillets, and the space between boarding and the floor filled with pugging sand or sawdust.—Quid.

[6511.]—**Lawn-Tennis Ground.**—Ask a painter to prepare a quick-drying white-lead paint.—Hugh McLachlan.

[6512.]—**Architects' Charges.**—The following is an extract from Rule 1 of the schedule of the Royal Institute of British Architects for professional practice and charges: "Besides which all travelling and other incidental expenses incurred by the architect are paid by the employer, who may be also charged for time occupied in travelling if the work be executed at a considerable or inconvenient distance," the "which" referring to the usual commission of 5 per cent. The minimum time charge according to the same schedule is three guineas a day and may be higher according to the "professional position" of the architect. This answers the first part of the query. There is nothing in the schedule that applies to the second part, 2½ per cent. being the lowest charge named, this includes specification besides the plans, elevations, and sections complete. Hurst's "Architectural Surveyor's Handbook" gives "preliminary sketches and designs complete, including survey of site, &c., 1½ per cent." I suppose querist has not made a survey of site, in which case I believe 1 per cent. is generally charged. This would give on the several amounts £14, £16 10s., and £20 15s., or a total of £51 5s., besides cost of travelling, time, &c., given in the first part of the query. If querist is commencing practice, it would be better to make no charge for time spent in travelling and in London.—Hugh McLachlan.

CHIPS.

The City Commissioners of Sewers last week considered a recommendation from the Finance Committee that the sum of £500 (one year's salary) be given as a gratuity to the widow of the late Mr. W. G. Haywood, who was employed for 33 years in the chief engineer's office, and for 20 years of that time as the principal assistant. An amendment raising the gratuity to £750 was carried by a large majority.

A memorial pulpit has just been erected in St. Mary Magdalene Church, Worcester, at the cost of Lieut.-Colonel Johnstone. It is circular in form, and has a dark marble base and columns and carved alabaster cornice. In the central drum are sunk two large and two small panels, occupied by carved scenes, and divided by rich pilasters and crockets. Mr. W. Forsyth, of the Tything, Worcester, carried out the work.

The parish church of Malpas is about to be restored from plans prepared by Mr. John Douglas, of Chester. The works will include the repair of masonry and tracery, the removal of colour and wash from the walls, the filling of east window with stained glass, the reseating in oak of nave aisles and choir, and the provision of new screen at west end, and new heating apparatus. The cost will be £3,000.

The first meeting for the summer season of the Cumberland and Westmoreland Antiquarian and Archæological Society will be held at Kendal in the last week of June, and the second meeting, at a later period of the year, at Ravenglass.

A new line of tramways is to be inspected in Derby by Major-General Hutchinson to-day. It extends from St. Peter's-street to the Normanton Hotel, Pear Tree-hill, and is 1½ miles long. Mr. Johnstone is the engineer.

A technical exhibition of woodwork and joinery was opened last week at the Fine Art Gallery, High-street, Ipswich, having been organised by a committee, of whom Mr. J. R. Jefferies, of the firm of Ransomes, Head and Jefferies, was chairman. Prizes amounting to £50 were offered for competition, and the result was a satisfactory display.

The first of a series of lectures, before the recently-formed Dublin Ladies' Sanitary Association, was given on Tuesday in the theatre of the Royal Dublin Society by Dr. T. W. Grimshaw, Registrar-General for Ireland, who took for his subject "The Causes of Disease and Death in Dublin."

LEGAL INTELLIGENCE.

Pavement Lights.—Hayward v. Hamilton.—This was an action in the Court of Appeal, before Lords Justices Bramwell, Brett, and Cotton, for infringement of a patent for improved pavement lights. The plaintiff claimed to have invented and patented a pavement light consisting of an iron frame supporting glass prisms upon flanges in such a position that the light from above is thrown in a lateral direction through the windows of rooms below the level of the pavement. The defendants disputed the novelty of the invention, and denied the alleged infringement. Mr. Baron Pollock and Mr. Justice Hawkins, sitting as a Divisional Court, gave judgment in favour of the plaintiff. The defendants appealed. The arguments on the appeal were heard on the 17th inst., Mr. Webster, Q.C., and Mr. Carpmael appearing for the plaintiff; Mr. Aston, Q.C., and Mr. Macrory for the defendants. Their Lordships, on Tuesday, delivered judgment to the following effect, according to a report in the *Times*. Lord Justice Bramwell said the judgment of the Divisional Court must be affirmed. The plaintiff said that he had found out and patented a novelty. It was almost manifest that he had done so, if the invention could be expressed in one word. He had discovered a light-directing pavement light. No doubt the invention was not a very great one; it was not like the invention of a sewing-machine or a threshing machine. The knowledge that a prism, used as the plaintiff used it, would direct light as the plaintiff's did, was old, and the other part of the apparatus, the making of the pavement, was old; but the combination of the two old parts was new, and might be the subject of a patent. It might be observed that it was very strange that such an article was never used before if it was no invention. As to the infringement, that was perfectly manifest; the pavement lights made by the defendants were not merely a colourable imitation, but the same thing as the plaintiff's. Lord Justice Brett said that the case depended upon the construction of the specification of the invention. If that claimed a new apparatus or combination, that apparatus or combination was the subject of a patent. The proper construction of the specification was that the plaintiff claimed a new pavement light, made by combining together an old frame, an old flange, and perhaps an old prism, parts which had never been so combined before. His Lordship then examined the terms of the specification, and expressed his opinion that the claim was stated unusually clearly. The plaintiff did not claim the invention of a frame, a flange, a glass, or a prism, individually, but the invention of an apparatus which involved the use of those articles. Then, was that apparatus a new thing? It was said, that the decklights of ships were an anticipation; but they were not used to throw the light sideways in one direction, as the plaintiff's pavement lights did. It was further argued that a prism called "Darker's Prism" was an anticipation of the plaintiff's use of the prism; but Darker's prism was not used in a horizontal position to throw light in a fixed direction and at a certain angles but turned on a pivot, and was used to throw light to any given point. It was therefore preposterous to say that Darker's prism was used as a machine for the same purpose as the plaintiff's machine. The plaintiff's machine was therefore new, and it was admitted that it was useful. The point had been raised whether there was any invention. He could not remember any case in which that question had been raised where it had been admitted that the apparatus in question was new and useful. He should say that in 99 cases out of 100 novelty and utility would imply an invention, though he did not think that that could be predicated as an absolute rule of law. In this case he thought there was an invention. As to the question of infringement, it was rather a painful one, for it appeared that the infringement was not innocent. There was evidence that the defendant's son, who was formerly in plaintiff's employ, acquired knowledge of the invention from him, and communicated it to the defendants, and the defendants' specification seemed artfully drawn, so as to conceal an intended infringement. That, however, was not material, for the articles made and sold by the defendants were exactly the same as the plaintiff's, except that the defendants' prisms had a notch in them, which was useless and a mere sham. The appeal must therefore be dismissed. Lord Justice Cotton delivered judgment to the same effect. Mr. Danckwerts applied on behalf of the defendants for a stay of the injunction and account of profits pending an appeal to the House of Lords; but their lordships refused to grant it.

Injunction against a Builder.—On Friday, in the Chancery Division, before Vice-Chancellor Hall, Mr. Pearson, Q.C., moved for an interim injunction in the case of Friend *v.* Wickham, restraining the defendant, until the trial of the action, from carrying on the business of a builder in a dwelling-house on the Stanford estate, Brighton. Mr. Pearson stated that the house in question was let to the defendant on a lease, containing a covenant against the premises being turned to any other use than that of a private dwelling-house. The defendant had broken that covenant by carrying on the business of a builder on the premises. As the defendant did not now appear, and had not entered an appearance on the writ, the Vice-Chancellor granted an injunction in the terms of the notice of motion.

Action for Libel by a Builder.—Cooper v. Cowing.—In the Queen's Bench Division, at Westminster, on Friday last, the 20th inst., this action was heard, in which the plaintiff, a builder, of Finchley, sought to recover from the proprietor and publisher of the *Barnet Press* £500 damages for publication of alleged libels. Mr. McIntyre, Q.C., and Mr. Francis Turner for the plaintiff; Mr. Bulwer, Q.C., and Mr. Agabeg for defendant. The alleged libel complained of was contained in a letter signed "Justice and No Favour," which appeared in the *Barnet Press* of September 18th, 1880, in which it was stated that although two builders at Finchley had been summoned by Mr. E. W. Brooking, surveyor to the Finchley local board, for putting in as a damp-course an improper material, namely, roofing-felt, another builder at Finchley had been and now was using the same material for a number of buildings; the writer asked why he was not summoned. Mr. Brooking replied, asking for the builder's name, but "Justice and No Favour" declined to give this, but said the houses referred to were between Hendon-lane and Finchley. Mr. Brooking retorted that the anonymous correspondent had mistaken the "patent bitumen damp-course," largely used by Mr. Henry Cooper (plaintiff), for roofing-felt, which the builder had never employed. "Justice and No Favour" at once replied, in the same issue of the paper in which Mr. Brooking's letter appeared, admitting that he had mistaken the material, and apologising to Mr. Brooking. Mr. Cooper's solicitor applied to the defendant for the name and address of the writer, and afterwards offered not to issue a writ for libel on condition that the name and address of the writer were disclosed, and three guineas, his costs, were paid. Plaintiff now deposed that he had not been able to sell any houses since the publication of the letters, and that he used fibrous asphalte for damp-courses, and not roofing-felt, which was of no more use than brown paper. For the defence, Mr. Bulwer contended that the only person on whom there might seem a reflection was Mr. Brooking, who had expressed himself satisfied with the apology, and that defendant had done all in his power by publishing a further apology on Oct. 30th. The judge, in summing up, said the main question was the apology of Oct. 30th enough, and the jury decided in favour of defendant on all points. Verdict entered for defendant, with costs.

Local Surveyor's Notices and Evidence.—Danks *v.* the West Bromwich Commissioners.—This case came before the Baron Huddleston and Mr. Justice Hawkins, in the Queen's Bench Division on Wednesday.—This was an appeal against the decision of the Staffordshire justices by way of a special case. Two points had been reserved for the decision of the Court, the appeal of the appellant (Mrs. Danks) being under the 10th and 11th Vic., cap. 34, sec. 75 of the Towns Improvement Act. The first point for the consideration of the Court was whether a notice given by a surveyor under the Act to a person to do certain things to a building which was considered to be in a ruinous state, was a valid notice; and the second point whether, when the case came before the magistrates, they were justified in refusing to hear any other evidence than that of the surveyor. The section of the Act under which the appeal was brought stated: "The surveyor shall cause notice in writing to be given to the owner of such building, requiring such owner or occupier forthwith to take down, secure, or repair such building, wall, or other thing, as the case shall require." The surveyor in this case gave the appellant notice to take down, secure, or repair the building in question leaving it to the appellant to make her own choice as to what she would do. The appellant contended that the notice was a bad one, because it did not state specifically whether she had to take down the building or repair it.—The Court held that the notice should have stated whether the appellant had to take down, secure, or repair the building, and, that therefore, they should send the case back to the justices to be reheard. The appeal would, therefore, be allowed, with costs.

Bankrupt Architects and their Property.—Emden v. Carte.—This was an appeal to the supreme court from a decision of Mr. Justice Fry. The plaintiff is an architect, and in 1877 the defendant, Mr. D'Oyly Carte, agreed to employ him for the building of a theatre. In April, 1878, the plaintiff was adjudicated a bankrupt. In June, 1880, he was dismissed by the defendant. The plaintiff brought the action claiming £1,790 as remuneration for services rendered under the agreement subsequently to the adjudication, and £3,000 for wrongful dismissal. The plaintiff not having obtained a discharge in the bankruptcy,

the trustee took out a summons in the action, asking that he might be substituted as plaintiff in the action in the place of the bankrupt, and might be at liberty to carry on the proceedings. Mr. Justice Fry was of opinion that, although the personal services of the bankrupt as architect were an inducement to the contract, the fruit of the contract by way of remuneration and the right to damages for wrongful dismissal passed to the trustee, and that the trustee had a right to intervene in the action. And his Lordship added the trustee as a co-plaintiff, and gave him the conduct of the proceedings. The bankrupt appealed. Mr. A. Beddall, for the appellant, urged on Wednesday that the claim in the action was in respect of personal services of the bankrupt, and the earnings in respect of such services did not pass to a trustee in bankruptcy. Mr. Francis Turner and Mr. G. A. Vennell, for the trustee, were not heard; Mr. Higgins, Q.C., and Mr. Everitt were for the defendant. The Master of the Rolls entirely agreed with Mr. Justice Fry. No doubt the words of the Bankruptcy Act were large enough to pass everything which a bankrupt had to his trustee; they would include every *chose in action*. But there were many cases in which it had been held that money paid to a bankrupt for his manual labour or personal services was not to be taken by the trustee. Those cases had no application to a case like the present. The plaintiff was an architect, carrying on his business in the ordinary way, with extensive offices and a staff of clerks. Could it be supposed that such large sums as were claimed in this action were to be kept by an undischarged bankrupt? None of the Judges who had made the distinction between personal earnings and property ever dreamt of laying down such law as that. Mr. Justice Fry had arrived at a right conclusion as to the title to the subject-matter of the claim, and that being so, he was also right in adding the trustee as a co-plaintiff. Lord Justice James concurred. Lord Justice Lush said that the case was quite covered by authority. The exception which had been established did not apply. What a bankrupt earned, if it was only sufficient to maintain himself in life and health, could not be said to be property. But any surplus beyond that was property, and belonged to his trustee.

WATER SUPPLY AND SANITARY MATTERS.

THE WATER SUPPLIES OF WEST CUMBERLAND.—A paper on this subject was read on Tuesday week by Mr. Kitchin, of Whitehaven, at the annual meeting of the Cumberland Association for the Advancement of Literature and Art. Eight populous places have, the author showed, public supplies of water—namely, Whitehaven, Workington, Cockermouth, Maryport, Keswick, Millom, Cleaton Moor, and Arlington. That of Whitehaven is derived by gravitation from Ennerdale Lake, 9½ miles distant, and 370ft. above the sea-level. That of Worthington and Cockermouth is from Crummock, and also serves for the supply of the rural district of Cockermouth and the villages of Distington and Harrington in the district of rural sanitary authority of Whitehaven; it is brought 23 miles by gravitation, and the lake is 320ft. above the sea-level. The Maryport supply is taken from the Derwent, near the Goat's Mill, Cockermouth, is pumped to a reservoir 220ft. higher, and then conveyed by gravitation to Maryport. The other supplies are all collected. The author stated, as the result of detailed chemical analyses of the water supplies described, that they were all of a remarkably pure character.

STATUES, MEMORIALS, &c.

THE PRINCE IMPERIAL MEMORIAL.—The memorial to the late Prince Imperial has been completed by Mr. J. E. Boehms. The work has been executed in pure white statuary marble, and consists of an elaborately sculptured base, surmounted by a recumbent figure of the Prince in an undress artillery uniform. The head, uncovered, is supported by cushions embroidered with the Imperial bee. The hands, crossed upon the chest, clasp an unsheathed sword, the empty scabbard and gloves resting on the left side of the figure, with the spurs on the right, near the feet, which touch a helmet. The panels on the sides of the carved sarcophagus contain inscriptions recording the birth and death of the Prince. On Tuesday the memorial was placed in the centre of the Braye Chapel, which is situate on the south side of St. George's Chapel, Windsor, the ancient font having, it is said by the Queen's order, been displaced to make room for it.

STAINED GLASS.

WISTANSTOW.—A stained-glass window has just been erected in the parish-church, designed and executed by Mr. Davies, of the Wyle Cop, Shrewsbury. The subject is "Christ blessing little children."

Our Office Table.

PEOPLE who are tired of the bad roads to be found near the Metropolis will learn with envy how they manage things in Tennessee. The following is a section of the new Road Law, which has lately received the signature of the Governor: "Be it further enacted that all male inhabitants over 15 and under 50 years of age, except such as are permanently disabled from performing common labour, and are released by the Commissioners, shall work not less than three nor more than six days upon the highways each year, the work to be done at any time. The overseer shall give three days' notice of the time and place to commence. Any road hand so notified may be exempt from work by sending an able-bodied substitute, or by giving one dollar for each day, or by furnishing any team, or plough, or wagon, the overseer may require, and to be allowed a credit for the same."

THE arrangements for the enlargement of the Ruskin Museum at Sheffield have been in abeyance during the illness of Mr. Ruskin, but they have now been taken up again, and it is hoped will be carried on to completion. The present building stands in its own grounds on the brow of the hill, overlooking the Rivelin valley and the open country beyond. When the property was purchased by Mr. Ruskin there was scarcely a house near it, and already it is nearly surrounded, and building operations are still going on. When the necessity arose for the enlargement of the museum, Mr. Ruskin had it in contemplation to remove his treasures farther into the country, and farther from the smoke of the town. He has, however, decided to retain the present place and enlarge it, with the hope that another museum may spring out of it at some future time. The one would then be devoted to beginners, and the other to more advanced students. Plans of galleries are being prepared to be added to the present building, one of which, it is stated, will be 200ft. long. When ready, a meeting of the committee formed to raise funds with which to carry them out will be called. It is believed there will be no difficulty in obtaining the necessary money if only the assurance is given that the treasures will not at some future time be removed from the town.

AUSTRALIA is about to rival America in the length of its railway lines. It has just been determined to bridge the entire length of Central Australia. The line is to extend from Port Augusta to Port Darwin, the latter of which is one of the finest harbours in the country and large enough to hold the navies of the world, while the former has been pronounced by Sir William Jervois to be the key to Australia. The length will be 1,535 miles, and the line has already been laid from Port Augusta to the Government guns—a distance of 198 miles—at a cost of £578,944.

A RETURN has been issued showing the various modes of exit from theatres licensed by the Lord Chamberlain. A memorandum, which is prefixed to the return, states that it is taken from the statements supplied by the managers, verified by the officers of the Lord Chamberlain's department. It appears from the return that in every theatre there is a separate and independent exit for each class of the audience—viz., 1, stalls and dress circle; 2, pit; 3, gallery; irrespective of what are termed "extra exits"; while, in almost all cases, there are several means of egress from each part of the house. By the terms of the licence granted by the Lord Chamberlain, the manager is held responsible that they shall be always available in case of need.

WE have seldom seen a more useful or more business-like trade catalogue than one just sent to us by Messrs. Joseph Sandell and Co., of Waterloo Bridge-road. This well-known firm of timber merchants keep one of the largest stocks in the kingdom, and their catalogue is of a most complete and comprehensive character. Their lists and diagrams of Swedish doors and steam-struck mouldings are especially worth attention, and no architect or builder can fail to find the book useful. It contains 600 illustrations, very well executed.

AN application of an unusual character came before the Chester Consistory Court, on Thursday in last week. It was stated that Christ Church, Winsford, a building constructed by the trustees of the River Weaver Navigation, under the powers of a private Act of Parliament "for the accommodation of watermen" has, from the sinking of the ground at Winsford owing to brine-pumping, become quite untenable, and has been closed as dangerous by the Winsford Local Board. The incumbent, supported by the Weaver Navigation trustees, now appeal to the court for a faculty to remove the gallery and alter parts of the church, and to reconstruct the building upon a framework of iron pillars, by means of which the church might be gradually raised by hydraulic power or screw-jacks, should any further sinkings occur. The walls of the new structure are proposed to be of wood, covered on the outer faces with tiles, and the total cost was estimated at £1,500. No opposition being offered the faculty was decreed on the terms of citation.

AT the annual general meeting of the Sanitary Institute of Great Britain, held at 9, Conduit-street, on Wednesday last, Dr. B. W. Richardson, F.R.S., in the chair, a favourable report was presented by the council on the progress made by the institute during the past year. Particular attention was drawn to the ordinary meetings held by the institute for the reading of papers and discussions upon subjects relating to sanitary science, which papers and discussions are published in the yearly volume of *Transactions*. Dr. B. W. Richardson gave an interesting sketch of the formation and growth of the institute, and the council and officers for the ensuing year were elected, His Grace the Duke of Northumberland being president.

A BLUE-BOOK has been issued, containing a report of the progress of the Ordnance Survey to the 31st of December, 1880. When the scale of the maps was, on the recommendation of a committee in 1854-5, increased to 25in. to a mile for the cultivated districts, the counties of England then remaining to be surveyed (Cumberland, Durham, Westmoreland, and Northumberland) were published on this scale. When this was done a re-survey on the 25in. scale of the rest of England was begun. The mineral districts of North Wales, Cheshire, and North Shropshire have been surveyed and published on the 25in. scale; portions of those of North Staffordshire, Derbyshire, Nottinghamshire, South Wales, Cornwall and Gloucestershire have been published, and the remaining parts of those districts and that of Leicestershire are in progress. The mineral district of Worcestershire and South Staffordshire has been commenced. The south-eastern counties, including Kent, Sussex, Hampshire, Surrey, Middlesex, and Essex, have been published on this scale, and Bedfordshire, Buckinghamshire, Berkshire, Hertfordshire, Oxfordshire, and Wiltshire are in progress. The counties of Norfolk and Suffolk are being surveyed at the request of the War Office. The sheets on the scale of 25in. to a mile are reduced by photography to that of 6in. to a mile, and a map is published on that scale. Scotland has been surveyed on the 25in. scale (with the exception of the uncultivated parts, which are on the 6in.), and Ireland on the 6in. The surveys of both Scotland and Ireland are complete. Until 1855 large towns were surveyed on a scale of 5ft. to a mile. Since then a scale of about 10ft. to a mile has been adopted for towns having more than 4,000 inhabitants. It is expected that the whole survey will be completed by 1890. Out of a total area of 59,470 square miles in England and Wales, 34,696 square miles have been surveyed, 1,672 having been done last year.

THE attention of the Whitechapel District Board of Works has been called to various complaints made to their Sanitary Department respecting the overcrowding and indecent occupation of houses in the district by the lodgment of emigrants who are in course of transit from the Continent to America and other places. It appears the emigrants are consigned in large companies, numbering hundreds at a time, to agents in London, who, pending the departure of the Atlantic steamers, undertake to provide the people with food and lodging at a fixed price per head. The result is a great overcrowding of both sexes in the purlieus of Whitechapel adjacent to the docks. The sanitary inspector reported to the Whitechapel Board of Works at their last meeting that, in company with the police authorities, he had visited several houses in which the emigrants were

lodged, and found them much overcrowded, there being, in some instances, as little as 190 cubic feet of space for each person. In a room at No. 19, Grace's-alley, he found a quantity of straw upon the floor, and upon this a number of emigrants of both sexes had been sleeping at 4d. per head per night. There was not a particle of furniture in the room. Notices were ordered to be served upon the various persons who "accommodate" these emigrants that each room only be permitted to be used by the number allowed by the law, and that a breach of the Lodging-house Regulations will involve prosecution by the local authorities.

THE fifty-fifth election of pensioners at the Builders' Benevolent Institution took place on Thursday last. The following were the successful candidates:—Thomas Gregory Bartlett, aged 65 (second application), 3,616 votes; John Page, aged 67 (second application), 3,379; James Pilgrim, aged 60 (second application), 2,808; Anne Boulton, aged 62 (fourth application), 3,672; and Selina Thomas, aged 75 (fourth application), 3,040. Mr. Thomas F. Rider, President, occupied the chair, and the scrutineers were Messrs. Thos. Stirling and F. W. Keeble.

CHIPS.

The series of lectures on "Sanitary Plumbing," now in course of delivery at the Society of Arts by Mr. S. Stevens Hellyer, is to be repeated. The second lecture, which is to be given on June 1, will be repeated at the same place on June 3. The date for the repetition of the remaining lectures will be announced hereafter. Tickets can be had at the publishing office of the BUILDING NEWS, 31, Tavistock-street, as before.

At a special meeting held at Halstead, Essex, on Monday week, it was resolved to take steps for enlarging the parish church, by the addition of a chancel, aisle, and organ-chamber, at an estimated cost of £2,400.

The select vestry of Richmond, Surrey, have received from Mr. Homersham, C.E., their consulting engineer for water supply, a recommendation to deepen the existing well in lieu of constructing a second and separate one as originally proposed. The cost is estimated at a reduction of £2,000 in favour of the change, and the vestry have decided to adopt the new scheme, provided the sanction of the Local Government Board be obtained.

A stained-glass window has just been placed in St. James's Church, Devizes, to the memory of the officers and men of the 99th Regiment who fell in the Zulu War.

The parish church of Limpenhoe, Norfolk, which had fallen into a very dilapidated state, is undergoing restoration. Mr. A. S. Hewitt, of Yarmouth, is the architect, and Mr. Hawes, of Norwich, is the contractor.

An inquiry was recently held at Weston-super-Mare, before Mr. Samuel J. Smith, C.E., one of the inspectors of the Local Government Board, relative to an application from the Weston local board of health for sanction to borrow £28,000 for purchasing, laying out, and improving certain lands of public use, and as public walks and pleasure-grounds. Great opposition was offered to the scheme, and eventually the promoters proposed to adopt a modified scheme, on which the inspector will also report, as well as on the original proposition.

Lamplough's Pyretic Saline is refreshing, most agreeable, and the preventive of FEVERS, BILIOUSNESS, SMALL POX, SKIN DISEASES, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill. *Use no substitute* —[ADVT.]

Holloway's Ointment is not only fitted for healing sores, wounds, and relieving external ailments, but rubbed upon the abdomen it acts as a derivative, and thus displays the utmost salutary influence over stomachic disorders; derangements of the liver, irregularities of the bowels, and other intestine inconveniences which mar man's comfort.—ADVT.]

MEETINGS FOR THE ENSUING WEEK.

TUESDAY.—National Health Society. "The Science and Art of Sanitary Plumbing." By S. Stevens Hellyer. Lecture No. 2, "Joints and Pipe Bending." Society of Arts room. 7.30 p.m.
Institution of Civil Engineers. "The Production of Paraffin and Paraffin Oil." By R. H. Brunton, M.Inst.C.E. 8 p.m.

WEDNESDAY.—British Archæological Association. "Mermaids." By H. Syer Cuming, F.S.A. Scot. "Articles Found in London." By Rev. S. M. Mayhew. 8 p.m.

THURSDAY.—St. Paul's Ecclesiological Society. "Old St. Paul's and Some of its Surroundings." By Rev. W. Sparrow Simpson, D.D., F.S.A. 7.30 p.m.
Society for the Fine Arts. "Musical Lecture." By Alfred S. Gilbert. 8 p.m.

FRIDAY.—Royal Institution. "Magnetic Disturbances, Auroræ and Earth Currents." By Prof. W. G. Adams, M.A., F.R.S. 9 p.m.

Trade News.

WAGES MOVEMENTS.

CARDIFF.—The strike for an increase of wages amongst the men employed by Mr. Hill, contractor for the new docks, virtually ceased on Friday, fresh bodies of men having come in under police protection, at the rates refused by the old hands, some of whom also returned to work.

GREENOCK.—Messrs. Robert Steele and Co., shipbuilders and engineers, announce that on and after this day (Friday) they will give the joiners in their employment an advance of 7½ per cent. on the present rate of wages.

Doulting Freestone and Ham Hill Stone of best quality. Prices, delivered at any part of the United Kingdom, given on application to CHARLES TRASK,
Norton-sub-Hamdon, Ilminster, Somerset. —[ADVT.]

McLACHLAN & SONS, 35, St. James's street, S.W. Builders, Decorators, and House Painters. Designs and Estimates.
General Repairs and Alterations Executed. Experienced Workmen always in readiness, and sent to any part of the country.—[ADVT.]

BATH STONE.
BOX GROUND,
THE BEST FOR ALL EXTERNAL USE.
CORSHAM DOWN
CANNOT BE SURPASSED IN BEAUTY OF APPEARANCE FOR INTERIOR WORK.
PICTOR & SONS, BOX, WILTS.
(See trade advt. on p. XXV.) [ADVT.]

TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender—it adds to the value of the information.

ABERDARE.—For fencing-in the recreation-ground at Aberdare Park, for the local board:—
Reed, C., Aberdare (accepted):

ADDLESTONE.—For the erection of a villa residence for Mr. J. J. Bates, at Addlestone, Surrey, according to plans, specifications, and quantities supplied by Mr. R. Tomlinson, architect, of Gunnersbury, London, W:—

Bottomley, A. and Co.	£1,190 0 0
Martin, J.	1,050 0 0
Lyford G., ...	990 0 0
Brown and Park	975 0 0
Brown	950 0 0
Parker	870 0 0
Warr	857 0 0

ANERLEY, S.E.—For organ-chamber, &c., at Kilmorey House, for Mr. Alfred Meager. Mr. C. J. C. Pawley, 26, Moorgate-street, E.C., architect:—
Hollidge and Stuart (accepted) ... £229 0 0

BANGOR.—For erecting a police-station, Bangor. Mr. John Thomas, county surveyor:—

Williams, D., Carnarvon	£2,888 0 0
Morris, O., Carnarvon	2,789 0 0
Jones, E., Llanwnda (accepted) ..	2,788 0 0
Thomas, W., Bangor	2,670 0 0
Roberts, Bethesda	2,455 0 0
County Surveyor's estimate ...	2,750 0 0

BATTERSEA.—For alterations to Nos. 7, 9, 11, and 13, York-road, Battersea. Messrs. Muggeridge and Powell, architects:—

Castle	697 0 0
Pyke	675 0 0
Whitby	480 0 0
Fisher (accepted)	469 0 0

BIRMINGHAM.—For the erection of omnibus shed and stabling in Highgate-street, for the Birmingham Tramways and Omnibus Company (Limited). Mr. T. J. Perry, architect:—

Hulbert	£2,298 5 4
Bennett	1,997 0 0
Pritchard	1,788 0 0
Cottrell (accepted)	1,743 0 0

BRENTFORD.—For the fitting up of premises in High-street, Brentford, as a Coffee Tavern, for the United Kingdom Coffee Taverns Company (Limited). Mr. A. Burr, 10, Queen-square, W.C., architect:—

Smith, W. H.	£279 17 6
Hogben, T., 3, City-road	245 0 0

BRIXTON.—For warehouse, Brixton, for Mr. W. H. Stevens. Mr. C. V. Hunter, architect:—

Peacock	£870 0 0
Row	725 0 0
Cooper	715 0 0
Pack Bros.	707 0 0
Mallet	695 0 0
Harris	685 0 0
Cass and Beldon	640 0 0
Higgs, F	624 0 0

CUPAR, N.B.—For a new drain from the Cemetery, for the Cupar police commission:—
Marr, John (accepted) £79 11 0

CAMBERWELL, S.E.—For alterations and additions to the transferred department (late Emmanuel Church School) of the school in Camberwell-road, to fit it for use as an infants' department, for the London School Board:

Higgs and Hill	£1,389 0 0
Jerrard, S. J., Lewisham (accepted)	1,333 0 0

[Cost of general additions and alterations, £953; covered playground for girls and infants, £100; levelling and tar-paving, £180, new w.c.'s for infants, £100; total, £1,333.]

CARNARVON.—For new infirmary, &c., at the Carnarvon Union workhouse. Messrs. Thomas and Ingleton, 11, Market-street, Carnarvon, architects and surveyors:—

Thomas, Bangor	£3,171 0 0
Jones, E., Llanwnda	2,950 0 0
Edwards, H., Cae Athw	2 947 0 0
Morris, O., Carnarvon	2,897 0 0
Williams, R. R., Carnarvon ...	2,791 0 0
Williams, D., Carnarvon	2,578 0 0
Roberts, Bethesda	2,290 0 0
Architects' Estima'e	2,600 0 0

DEPTFORD.—For the construction of a relief sewer from the Broadway, Deptford, to Lee-bridge, for the Metropolitan Board of Works. Sir J. W. Bazalgette, C.E., engineer to the board:—

Cooke, and Co.	£31,000 0 0
Dickinson, C.	33,330 0 0
Neave, J. W.	31,463 0 0
Ridley, T. D.	30,990 0 0
Webster, W.	30,533 0 0
Anderson, A. and D.	30,000 0 0
Kellett and Bentley	29,300 0 0
Nowell and Robson	27,500 0 0
Mowlem and Co.	27,396 0 0
Etheridge and Acock	22,475 0 0
Simmons, J.	21,430 0 0

DOVER.—For new coach-house, stables, and dwelling-house, Castle-street, Dover, for Messrs. Packham:—

Parks, G., Dover	£1,445 0 0
Bourne, J., Dover	1,395 0 0
Lewis, G., Dover	1,350 0 0
Adcock, W. J., Dover	1,340 0 0
Richardson, H., Dover	1,322 0 0
Wiles, W. J. and Co., Dover ...	1,287 0 0
Denne, G. H., Deal	1,239 0 0
Stiff, H., Dover (accepted) ...	1,217 0 0
Dowle, T. W., Dover	1,200 0 0

DOVER.—For rebuilding premises, 24, Market-square, Dover, for the Dover Conservative Club:—
Adcock, W. J. (accepted) £2,400 0 0

DULWICH.—For compressed asphalte footway paving in Dulwich, for the Camberwell vestry:—
French Asphalte Co. (accepted) at £1,274 for College-road, £1,497 for Dulwich-wood-park, £1,368 for Farquhar-road, and £182 for Jasper-road.

GREAT BOWDEN.—For small cottage at Great Bowden, Market Harborough. Mr. W. Talbot Brown, Wellingborough, architect:—
Henson, G., Wellingboro' (accepted) £235 15 0

GROVE PARK, S.E. — For alterations to Inglewood House, Grove Park, S.E., for Mr. F. A. Crisp. Mr. C. V. Hunter, architect:—

Gillow and Co.	£465 10 0
Pritchard, W. H.	322 0 0
Ponsford	247 0 0
Horton	185 0 0

Total estimate, £1,219.

GUISBOROUGH, YORKSHIRE.—For the erection of a girls' wing and a master's house to the Northgate Schools, for the Guisborough School Board. Messrs. Armfield and Bottomley, Middlesbrough and Whitby, architects. Quantities by Mr. J. Mitchell Bottomley, architect to the board, 1, Zetland-road, Middlesbrough:—

	Girls' Wing.	Master's House.	Total.
Inglis, F., Guisborough	£1,454 0 0	£563 7 0	£2,017 7 0
Bolton and Key, Loftus	1,502 1 1	472 7 10	1,974 8 11
Lagonby, G., Stockton	1,277 18 6	549 17 6	1,827 16 0
Dickinson, T., Saltburn	1,250 16 1	497 0 6	1,756 16 7
Sturdy, J. R. and W., Middlesbrough ...	1,171 0 0	470 10 0	1 641 19 0
White, A., Guisborough	1,167 6 4	412 11 9	1,579 18 1
Heckle Bros., Guisborough	1,141 2 6	429 2 6	1,573 5 0
Cass, R., Guisborough (accepted) ...	1,060 16 6	439 8 9	1,529 5 3

GUISBOROUGH, YORKSHIRE.—For the erection of school buildings for the use of the church, at the sole cost of Admiral Chaloner. Messrs. Armfield and Bottomley, 1, Zetland-road, Middlesbrough, and at Whitby, architects:—

Inglis, F., Guisborough	£1,541 11 6
Johnston, J., Middlesbrough ...	1,430 0 0
Yeo, W. C., Middlesbrough ...	1,300 0 0
Dickinson, T., Saltburn	1,292 16 3
Brown, J., Guisborough	1,284 15 0
Cass, R., Guisborough (accepted)	1,280 15 0
Sturdy, J. R. & W., Middlesbro'	1,280 0 0
Heckle, Bros., Guisborough ...	1,209 16 0

Higham Ferrers.—For cottages and shops at Higham Ferrers. Mr. W. Talbot Brown, Wellingborough, architect:—

Green, G. H., Wellingborough ...	£1,700 10 0

(Accepted, with additions.)

Highgate.—For alterations and additions to Greenfield Lodge, Highgate, for Mrs. J. Rooth. Mr. J. T. Newman, 2, Fen-court, E.C, architect. Quantities not supplied:—

North Bros.	£843 0 0
Reed, A.	832 0 0
Hoskings, G.	827 0 0
Hearle and Son...	793 0 0
Abrahams, R. (accepted)	758 0 0

London, S.E.—For alterations and additions to Nos. 128 and 130, New Kent-road, S.E., for Mrs. Thwaites. Messrs. Muggeridge and Powell, architects:—

Suter	£390 0 0
Whitby	300 0 0
Burman (accepted)	297 0 0

London, W.—For completing houses at Portobello-road, Notting-hill, for Mr. E. P. Landon and Mr. G. H. Tatham. Messrs. Ebbetts and Cobb, architects and surveyors, Savoy House, 115, Strand, W. C.:—

Sanders, F.	£365 0 0
Wilhamson, J.	280 0 0
King, D.	275 0 0
Baker, J.	248 0 0
Steel Bros.	190 0 0

London, E.—For the rebuilding of a warehouse in Bevis Marks, for Mr. Deputy Stapleton. Messrs. Hammack and Lambert, architects:—

Cocks, J. and H.	£1,565 0 0
Cubitt, W.	1,195 0 0
Johnson, J. H.	993 0 0

London, W.C.—For the construction of a brick sewer in Guildford-street, Russell-square, for the Metropolitan Board of Works. Sir Joseph W. Bazalgette, engineer to the board:—

Alldred, G., Hammersmith (accepted), £2,245.

Maesteg.—For forming a reservoir at Tonna, for the Maesteg Local Board:—

Hughes, Wm. (accepted), on schedule of prices.

Market Harborough.—For small house at Market Harborough. Mr. W. Talbot Brown, Wellingborough, architect:—

Henson, G., Wellingboro' (accepted)	£507 14 6

Notting Hill.—For new wine-cellars, and other additions and alterations, at 92, High-street, Notting Hill Gate, for Messrs. George Lawrence and Sons. Messrs. Harvey and Protheroe, 10, Great Queen-street Westminster, architects;—

Macey, J. M., and Sons (accepted) £500.

Rushden.—For new wayside tavern, Rushden. Mr. W. Talbot Brown, Wellingborough, architect:—

Adams and Lovell	£871 14 0
Underwood, J.	820 0 0
Hudson and Stevens	768 15 0
Millar, F.	755 0 0
Green, G. H.	735 0 0
Sparrow, H.	707 0 0
Bayes, G. & Hacksley, Wellingboro'*	679 0 0

*Accepted.

Newington, S.E.—For the erection of a school to provide accommodation for 1,400 children on a site in Mina-road, Old Kent-road, for the London School Board. Mr. E. R. Robson, F.S.A., archieect to the board:—

Lathey Bros.	£15,534 0 0
Marsland, J.	15,315 0 0
Williams, G. S. S. and Son ...	14,784 0 0
Higgs and Hill	14,350 0 0
Braid and Co.	14,298 0 0
Staines and Son	14,184 0 0
Nightingale, B. E.	14,131 0 0
Shepherd, W.	13,889 0 0
Jerrard, S. J.	13,683 0 0
Chappell, J. T.	13,650 0 0
Kirk and Randall	13,464 0 0
Wall, C., Lot's-road, Chelsea* ...	13,130 0 0

*Accepted.

[Cost of site (area 19,213 square feet), £4,601 7s. 3d.; (*a*) cost of school buildings only (including closets), £11,740; (*b*) cost of tar pavement and playground, £402; (*c*) cost of boundary-walls and gates, £638; (*d*) cost of teachers' rooms, £300; (*e*) cost of schoolkeeper's house, £50; total, £13,130. Cost per head of (*a*), £8 7s. 8d.; total cost per head, £9 7s. 6d.]

Southwark.—For removing the dust and trade refuse, during a period of three years, for St. Olave's district board of works:—

Back (accepted)	£2,590 per year.

[The present contract was taken by E. Reddin at £2,399 per year.]

Taunton. — For a pair of semi-detached dwelling-houses, to be built on the Elms Nursery Estate, Taunton, for Mr. J. H. Bale, and Mr. A. Chapman. Mr. C. H. Samson, Taunton, architect:—

Templeman, W.	£2,538 0 0
Spiller, H. J.	2,440 0 0
Dinham and Verrier*	2,370 0 0

* Accepted with modifications.

Teignmouth.—For the building of new Congregational Church, with pitch-pine internal fittings:—

Hayman, S. J. U., Teignmouth ...	£4,684 0 0
Esworthy, Teignmouth	4,676 0 0
Estcort, Gloucester	4,500 0 0
Jones, D. C. and Co., Gloucester	4,306 0 0
Stacey and Rabbage, Newton ...	4,081 0 0
Slocombe, F., Teignmouth ...	4,044 0 0
Gibson, Exeter	3,971 0 0
Nicholls, J. and Son, Liskeard ...	3,920 0 0
Stevens and Bastow, Bristol ...	3,877 0 0
Foaden, Ashburton	3,840 0 0
Andrews, E., Teignmouth ...	3,655 0 0
Howell and Son, Bristol	3,614 0 0

Truro, Cornwall.—For additions to attics and new roof of dwelling-house, for Mr. Edward Sharp, surgeon, Truro. Mr. W. Clemens, architect:—

Julian, J. N. and Sons (accepted)...	£250 0 0

Worcester.—For the erection and completion of three new dwelling-houses and shops, Pump-street, Worcester, for Mr. J. A. Steward. Mr. John Henry Williams, architect, Green Hill, Worcester:—

Wood and Son, Worcester ...	£1,957 0 0
Kendrick, J., Worcester	1,950 0 0
Wells and Son, Worcester... ...	1,760 0 0
Osborn, T., Malvern	1,694 0 0
Bourne, J., Worcester	1,675 0 0
Dixon Brothers, Worcester* ...	1,645 0 0

*Accepted.

Woodford.—For alterations and additions to Wensley House, Woodford, for Mr. H. J. Cook. Mr. J. T. Newman, 2, Fen-court, E.C., architect. Quantities not supplied:—

Abrahams, R.	£794 0 0
Reed, A.	738 0 0
North Bros. (accepted)	630 0 0

Walham Green.—For stabling, shops, &c., at Fulham-road, Walham Green, for the London General Omnibus Company. Mr. Tosh, architect. Quantities by Messrs. Bolton:—

Button	£5,597 10 0
Cardus	4,467 0 0
Julian	4,423 0 0
Garrod	4,263 0 0
Lucas and Son	4,259 0 0
Richeirs and Mount	4,172 0 0
Richardson, J. O.	4,150 0 0
Ward and Lamble	3,719 0 0
Beale (accepted)	3,691 0 0

Westminster.—For rebuilding the Green Coat Boy public-house, for Messrs. Watney and Co. Quantities by Messrs. Batterbury and Huxley:—

Collinson	£3,380 0 0
Kiddle and Sons	3,265 0 0
Greenwood, J. and J.	3,197 0 0
Ashby Bros.	3,145 0 0
Anley, J. (accepted)	3,137 0 0

Wrexham.—For main drainage works, for the townships of Acton and Stansty, for the Rural Sanitary Authority. Messrs. Isaac Shone and Alfred C. Baugh, engineers:—

Harris, J. A., Shrewsbury... ...	£5,540 0 0
Fawkes Bros., Liverpool	4,987 14 7
Rogers, W., Wrexham	4,699 6 0
Beasley and Rowland, Flint ...	4,524 13 0
Raynor, G. G., Bootle ...	4,490 0 0
Roberts, J., Chester...	4,212 0 0
Davies Bros., Wrexham	4,184 3 10
Jeffreys, R., Colwyn Bay	3,940 2 5
Samuel, W. E., Wrexham ...	3,880 0 0
Carter and Winter, Liverpool ...	3,828 2 8
Owen, B., Wrexham	3,690 0 0
Kirk, T., Chester	3,670 0 0
Dovener, J., Stoke-on-Trent ...	3,590 0 0
Bozson, G., Manchester	3,372 17 10
Turner, R. & Sons, Warrington*	3,352 0 0
Engineer's Estimate	4,135 0 0

*Accepted.

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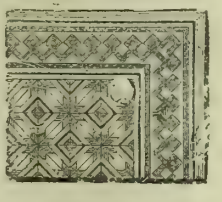

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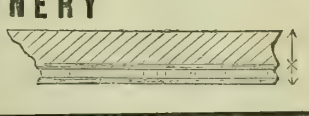

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ASSISTANT (Engineer, Architect, and Surveyor's) desires EMPLOYMENT; 7 years' practical experience. Age 25. First class surveyor, leveller, and draughtsman; references. No objection abroad.—B., 43, Cremorne-street, Nottingham.

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IMPROVER (Architect's) desires an Immediate ENGAGEMENT in a Builder's or Architect's office; 4 years' experience.—Address, W. M., Watergate House, Bulford, Amesbury, Salisbury.

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Selected candidates will be called upon to attend a meeting of the Committee at the same place on Monday, June 6th, at seven p.m.

By order,
GEORGE WHALE,
Clerk to the Plumstead District Board of Works.

Old Charlton, May 25th, 1881.

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The person to be appointed must be able to prepare plans and specifications, to make tracings, and, if required, to take levels and make surveys. He must also have experience in general office work. Applications for the office must be by letter, addressed to "The Clerk of the Metropolitan Board of Works, Spring Gardens, S.W.," not later than TUESDAY, the 14th June next, and they must contain full particulars of age and qualifications, and also be accompanied by testimonials.

Candidates must not be less than 22 or more than 30 years of age, and any application not in conformity with the terms of this advertisement will not be laid before the Board.

J. E. WAKEFIELD, Clerk of the Board.

Spring Gardens, S.W., 25th May, 1881.

TO ARCHITECTS and SURVEYORS.—WANTED, in a good office, SITUATION as Improver. First-class references. Five years' experience. Salary not so much an object as improvement.—Address, G. SLINN, Endon, Stoke-on-Trent.

TO ARCHITECTS, SURVEYORS, &c. Builder of capital and reputation will give a liberal Bonus to anyone who will introduce him work (directly or indirectly), private or competition.—Apply by letter to J., 35, Gloucester-road, Camberwell, S.E.

TO ARCHITECTS, LAND AGENTS, and BUILDERS.—WANTED, by a thoroughly practical Man (age 28), a SITUATION as Clerk of Works, Building Surveyor on Agricultural Estate, or Builder's Assistant. Good draughtsman, working and detail drawings, specifications Estimates, supervision of workmen, &c. Highest references.—R. L., Park House, Hornserks, Bideford.

VACANCY for the Son of a Gentleman as Resident PUPIL in the Office of a Surveyor and Architect.—For particulars apply to A. G. DEMPSTER, Eastbourne.

APPRENTICE WANTED to the Artistic Furniture Graining. No premium.—22, Frederick-street, Hampstead road.

APPRENTICE WANTED for the French Polishing Trade. Small premium required. Also youth, about 16 years (not apprentice). Wages to commence 7s. per week. Good opportunity for learning French polishing.—W. NEWMAN, 78, Judd-street, Euston-road, W.C.

APPRENTICE WANTED to Learn Marble Work.—Apply, between 5 and 7 p.m., Marble Works, Latimer-road Railway Station, Notting Hill.

APPRENTICE, BUILDER'S — A youth of 17 desires a SITUATION as Indoor Apprentice in the country. Premium to be moderate.—THOS. RUSSELL, 48, Essex-street, Strand, W.C.

AS CLERK of WORKS; seven years in last situation. Been engaged on large works. Well versed in preparing details, measuring up, taking off quantities, surveys, and preparing models. Great experience in sanitary arrangements and ventilation.—R. A., 18, Foley-street, W.

BRICKLAYER, Plasterer, Slater, &c. WANTS EMPLOYMENT. Wages moderate.—K., 61, Hallplace, Edgware-road.

BRICKLAYING, POINTING.—JOBBING WANTED. Day or piece.—L., 18, Norfolk-street, Peckham.

BUILDERS.—WANTED by Respectable young man, 20, SITUATION as Improver to builders stone mason's work.—Address, G. SMITH, Red Lion-street, Croydon, Leamington.

CARPENTER and JOINER (Good) WANTED Immediately.—Apply, HOLMES and SONS, Builders, Highgate.

CARPENTER WANTS EMPLOYMENT. Good Mechanic; age 36.—F. H. B., 5, Ann's-buildings, South-street, Walworth.

CARPENTER WANTS SITUATION as good jobbing hand, or fixing, or bench. 7d. hour or piecework.—W. N., 206, Kingsland-road.

CARPENTER and JOINER (Good) WANTS WORK. Well up in jobbing and house repairs. Age 30; wages low.—HARRIS, 5, Southampton-terrace, Caledonian-road, King's-cross

CARPENTER WANTS JOB at bench. 7d. an hour, or work at home.—C. J., 33, Jewry-street, Aldgate.

CARPENTER'S SHOP.—A respectable youth, aged 17, requires EMPLOYMENT where he would have an opportunity of learning the trade. Low wages to commence.—G. P., 24, Spencer-street, Canonbury, N.

CARPENTER WANTS a JOB; married; low wages.—Apply, J. G., 25, Dean-street, New North-road, Islington, N.

CARPENTERING.—A Young Man WANTS JOB as Improver to above. Used to bench; 4½d. per hour.—S. P., 9, Wesley-street, Marylebone, W.

CEMENTERS WANTED. — Apply PARKINS and GIBSON, 5, Huggin-lane, Queen Victoria-street.

CLERK of WORKS, lately carried out large church under eminent Architect, requires another JOB (part time or otherwise.) Elderly, very experienced practical man, thoroughly qualified.—E. D., Mr. Benson, 10, Auckland-street, Vauxhall, S.E.

CLERK OF WORKS WANTED, to Superintend Erection of Hull Borough Asylum.—Apply, by letter, to SMITH and BRODRICK, Architects, Cogna Chambers, Hull, before noon JUNE 6th, stating age and previous engagements.

EVENING EMPLOYMENT WANTED, at home or otherwise, by Architectural Draughtsman. Designs, tracings, specifications. References.—HERBERT, 4, Englefield-road, N.

ENGINEERING.—SITUATION WANTED by a Draughtsman, aged 23. Good testimonials.—C. KIDSON, 26, Promenade, Southport.

GASFITTERS, &c. — SITUATION WANTED by youth, aged 18. Well up in jobbing.—A. F., 23 Circus-street, Marylebone road.

LAD (Respectable) wishes to be APPRENTICED to Plumbing, &c. Premium given.—A. B., 40, Spencer-road, South Hornsey.

LEAD GLAZIER WANTED.—LOVELL and CO., 53, Red Lion-street, Holborn.

LEICESTER SCHOOL OF ART, HASTINGS-STREET, LEICESTER.

In consequence of the resignation of the Head-Master of the above School on October 1st next, the Committee invite applications for the appointment. Testimonials and specimens to be forwarded not later than June 11, 1881, addressed to Samuel Barfield, Hon. Sec., School of Art, Leicester.

MANAGER or FOREMAN (Cement Works) WANTS a SITUATION, either at Home, or is willing to go abroad. Can give satisfactory reference.—R. H. J., care of Mr. Walton, Stationer, 1, Silver street, Stockton-on-Tees.

PAINTERS WANTED.—Apply to D. E. HUTTON, Briggate, Shipley.

PAINTERS and PAPERHANGERS.—WANTED, good steady Workmen.—Apply, CHAS. WAILES, Painter, &c., 58, North-street, Leeds.

PAINTERS, Paperhangers, Grainers, &c.—WANTED, several good Workmen.—Apply, ROBT. HOYLE, Painter, Armley.

PAINTERS.—WANTED, GOOD Painters and Paperhangers. Good wages for competent men.—Wm. KERSHAW, Bradford-road, Dewsbury.

PAINTERS, &c.—WANTED, on Monday next, 12 sober, steady men. Chiefly outside work.—Apply, first by letter, to Mr. F. TAYLOR, Builder and Decorator, Uxbridge.

PAINTERS WANTED for best Interior Work.—DAVEY BROTHERS, Dorking.

PAINTING BRUSH MAKERS WANTED. Must be good workmen.—DAVIS, Burrow and Sons, Leeds.

PAINTING, Paperhanging, Distempering, at very reduced terms for cash, by Mr. MIX, 7, Moreton-place, Pimlico, S.W. Town or country.

PAPER Stainers and Embossers.—WANTED, a Man who thoroughly understands colouring, graining, &c.—Apply, stating wages required, to Mr. BROWNE, Cledbury Mortimer, Salop.

PAPERHANGER (good) WANTS JOB (seaside). Well up in painting. Four years' experience from present employer.—HODGSON, 4, Dalyell-road, Stockwell.

PLASTERER WANTS EMPLOYMENT, either day or Job.—D. J. S., 11, Pedworth-road, Rotherhithe.

PLASTERERS. — WANTED, a few good Plasterers.—Apply to T. C. TATTERSALL, Wakefield.

PLASTERING.—To Country Builders, &c.—WANTED, to take PLASTERING, or as a Working Foreman, by a thorough practical and energetic Man. Highest references.—J. ELLISS, 10, Grovedale-road, Upper Holloway, N.

PLUMBERS.—WANTED, a 3-Branch Hand. One who can fill up his time in painting.—Apply to D. GRIGGS, Plumber, &c., Lower Norwood.

PLUMBER, Painter, and Glazier WANTED.—Write, stating age and wages required, to J. MARTIN, Builder, Addlestone, Surrey.

PLUMBER (Good) WANTED.—Apply Messrs. PEACOCK BROS., Builders, 51, Water-lane, Brixton-rise; or 22, Tulse Hill, S.W.

PLUMBER (Good) WANTS A JOB.—Address, PLUMBER, 6, Albert-street, Barnsbury.

PLUMBER, Gasfitter, Zinc Worker WANTS a JOB. Thorough practical.—HENRY ROBINSON, 47, Sterndale road, New road, Battersea.

RENT COLLECTOR.—A Man, with twenty years' experience in the Collecting of Weekly and Quarterly Rents, and Management of Estates for owners of extensive house property, is desirous of MANAGING and COLLECTING RENTS on weekly houses. Highest references and security.—J. E. HODSON, No. 92, New North-road, Islington, N.

STAINED GLASS, &c.—EMPLOYMENT sought by a first-class Figure Draughtsman and Designer. London preferred.—Address, J., St. Ives, West Hill, S.E.

STAIRCASE HAND (thoroughly practical) WANTS a JOB (day or piece.)—W. B. MAHLERT, 46, Carnaby-street, Regent-street, W.

STAIRCASES and HANDRAILS.—WANTED, by a practical Man, LABOUR ONLY, or take charge of any quantity of stairs and rails. Town or country.—Address, GEO. CAISTOR, 18, Bryan-street, Caledonian-road, London, N.

TIMEKEEPER, or in any light capacity.—SITUATION WANTED by a young man, 22; good references; abstainer.—J. B., 5, Alice Cottages, Plaistow, E.

TIMEKEEPER or Night Watchman. —SITUATION WANTED. Best of references given.—Address, T. P., 178, Great Dover-street, S.E.

TO BUILDERS' FOREMEN. — WANTED, at once, a practical man as FOREMAN of Joiner's shop, one who has a good knowledge of the other branches of a builder's business preferred.—Apply by letter, giving references, age, and salary required, to E. VAUGHAN, Contractor, Maidstone.

TO CABINET MAKERS.—A SITUATION as Improver, by a young man. Well experienced.—62, Chatham-street, Chorlton-upon-Medlock.

TO PAINTERS.—WANTED, a few good BRUSH HANDS.—Apply to GEO. BURNETT, Painter, &c., Market Hill, Barnsley.

TO MASTER BUILDERS.—WANTED, by a strong active Young Lad, EMPLOYMENT as Improver to Carpentering and Joining. Has been over three years in the trade. Willing to be useful. Sole object is to learn.—Address, H. G., Ightham-court, Sevenoaks, Kent.

WANTED, by a thoroughly trustworthy respectable Man, some regular POSITION of TRUST where thorough confidence is required. Would undertake management of good general repairs, &c.—Please address, stating requirements, terms, &c., J. B., 4, Ellerslie-road, Shepherd's Bush, W.

WANTED, by a Young Man, as Timekeeper, Collector, or any place of Trust. Salary not so much an object. Town or country.—P. S., 54, Railton-road, Herne Hill.

WEST LONDON DISTRICT SCHOOL, ASHFORD, near Staines, Middlesex.—The Board of Management require the SERVICES of an intelligent CARPENTER at the School, and invite candidates for the office. The person appointed will be required to reside in the school, must be single or a widower without children, and between 25 and 45 years of age. He will have to devote a portion of his time in instructing the boys in carpentry. The salary is £45 per annum, together with board and lodging. A form of application will be supplied if applied for. The applications with testimonials must be addressed to the Managers, and sent in to the Board Room of the Guardians St. George's Union, in Mount-street, Grosvenor-square, London, not later than 12 o'clock on WEDNESDAY, the 8th of June next, and on the following FRIDAY MORNING, at 11 o'clock a.m., the Candidates are required to be in attendance.

CHAS. D. HUME, Clerk to the Managers.

Ashford, near Staines, May 24th, 1881.

THE BUILDING NEWS.

LONDON, FRIDAY, JUNE 3, 1881.

SPECIFICATIONS.

IF, as some declare, the days of substantial house-building and good workmanship are past, so it seems is the practice of writing full specifications. Few of the present generation of architects have forgotten the volume of "Specifications for Practical Architecture," written by the late Alfred Bartholomew, and which, to this day, forms a model for all constructional requirements. It was truly an attempt to raise specification-writing to the dignity of a science, and to take it out of the rut of professional incompetence. Had its author lived in these days, he would have had cause now to lament that practical architecture had fallen to an even greater depth of degradation, and that men could be found who delighted to imitate some of the most debased forms of 18th-century design. But the charge made against architects by Bartholomew, that they did not know how to write specifications, might still be made, for many of the documents purporting to instruct artificers are not much better than mere lists of requirements, in which the verbal expressions "provide, and fix," "carefully perform," and "leave perfect to the satisfaction of the architect," occur in nearly every clause, and make a large percentage of the written words. No wonder practical builders seldom consult this document for their guidance, and ignore it altogether when a bill of quantities is supplied. We hear very frequently of the meagre specifications supplied to surveyors to work from, which, instead of assisting, rather impede the preparation of the quantities. Indeed, we know that in many instances, the most perfect specifications are prepared by the architect's surveyor, and it is considered an advantage by quantity-surveyors that the specification should be written by them. As the tendency of the present age is towards division of labour, this plan seems to commend itself to the architect who prefers to devote his time and energy to the more genial branches of his profession. Yet we cannot admit that the course recommended is one desirable in the interests of architects or constructive architecture; it places in the hands of the surveyor a more considerable power in the building than the architect himself possesses, as the surveyor thereby controls the construction and details, and, consequently, the expenditure. Moreover, we might almost look with alarm on another relegation of the duties of the architect, which would reduce his functions still more to those of a mere draughtsman, for if the specifications of buildings were intrusted to surveyors, they might readily claim also share in the design and constructive details.

There is a plan in writing a complete specification which ought to be a guide to the artificers in every part of the work, not a collection of generalities, with a number of particulars which can be better supplied by the drawings and quantities. A specification to be of any use should be instructive upon those points which are not found in the quantities, nor supplied in the drawings. Such expressions as "all to be carried out in accordance with the drawings, or to be executed as directed by the architect," are useless introductions, though they appear to make up a large part of most specifications. A good specification ought to throw light upon the drawings and quantities, and supply information they do not: it ought, in truth, to be written with reference to the quantities, or in contemplation of them. The conditions or preliminary clauses referring to any particular trade, ought necessarily to come first. The description of materials and general directions, as they apply throughout, should precede the detailed particulars of each item. Many quantity-surveyors are of opinion that the specification is best prepared after the quantities or the "abstracts" have been made, and no doubt this method facilitates the preparation, as those works requiring description are then before the writer. In ordinary contract-work, however, the specification is almost of necessity written beforehand, and, if prepared with care, becomes a very useful guide to the quantity-taker, as it shows the intention of the architect, and supplies the preliminary instructions on each trade, with the description of materials intended to be used. From an architect's point of view, there can be no doubt the description of materials, and the intentions of the design ought to take precedence of the quantities, and this can only be done by preparing the specifications with or immediately after the preparation of the working drawings. These documents together form the embodiment of the architect's intentions; the "quantities," on the other hand, are a distinct stage, being undertaken for the purpose of ascertaining the cost, and ought not to control the design of the architect.

In describing the different trades, a method of procedure is seldom rigidly adhered to. Some specifications begin with the bottom of the building, and carry this system through all the trades; others begin with the roof and work downwards, and in many documents for small houses, we have seen no order observed whatever, but a very general division commencing with the walls and roof, and describing, afterwards, in very vague terms, the floors, windows, and general fittings throughout. For good work, each floor ought to be taken consecutively for the joiner's work; the general clauses, as those relating to flooring, being taken first—e.g., the "first floor to be laid with 1¼in. yellow deal battens, dowelled with oak dowels, with mitre borders to hearths." A slovenly plan is adopted by many architects of mixing up the carpenter's with the joiner's work, as in directing floors to have fir joists of such and such a scantling, and to be laid with deal. Scantlings of all timbers, as of every other thing, ought, invariably, to be inserted in their proper place, and many serious omissions and "extras" have been the result of inattention to details such as these. How very often the architect blunders in omitting to describe dimensions of things not shown on the sections or drawings. Take, for example, concrete. It is seldom the sections show the exact depth of concrete that will actually have to be used under footings, and if they do, the probability is, that in other parts of the building not touched by the sections, the thicknesses will vary. These ought to be clearly described, and the dimensions stated in the specification. Then, in nearly every building, excavations vary, and the surplus earth has to be deposited somewhere; drains are required, perhaps, not shown on the plans; brickwork has to be set in cement; relieving-arches have to be turned; stones vary in size, or have to be set in a particular manner; partitions are to be trussed, and straps and bolts are necessary, and a variety of special requirements have to be met, the directions referring to which several items ought to be accurately stated. Too many architects implicitly take the drawings and write the specification entirely by their aid, trusting to them alone, and the consequence is that directly the surveyor begins to take off the quantities, he finds numerous omissions of things not considered; the items are referred to the architect or overlooked altogether, though it is not unusual to find large addenda tacked on the specification to render it in harmony with the quantities. So much by implicitly following the drawings. It is better for the architect to carefully think over the actual requirements, and to endeavour to discover the omissions in his drawings, so that they may be supplied by the specification, and a fairly good rule to follow is to make the completeness of that document depend on the degree of completeness of the drawings, so that the deficiencies in the latter may be supplied. Materials and workmanship, rather than useless references to the drawings, are the main things to be described, yet, strange to say, as a rule, architects give themselves more trouble by referring to drawings which do not exist, and to general descriptions ending "to be approved by the architect." Unmeaning adjectives and their superlatives are used at random, about which an extraordinary latitude is sometimes allowed.

We might fill a page with deficiencies of the ordinary run of specifications. Let us take a few instances in the "Carpenter and Joiner." The sizes of plates and rafters and joists are not unfrequently guessed at by the saving contractor, who does not consider it to his advantage to ask questions; the same inferences occur in the matter of thicknesses, which are often undescribed, the sizes of doors and the kinds of finishings required. In the "Smith and Ironfounder," the position of the down-pipes, and the class of fastenings to windows and doors, stoves, and other fittings, are questions of much unpleasantness, if not clearly specified. In the plumber's work, the weight of lead for gutters, flats, the width of flashings, and the height of turning up the lead, are constant items of disagreement, unless fully explained; and the same difference of opinion may exist between the minds of the contractor and architect about the thickness or qualities of glass and other items, if they are left unspecified. No contractor can be blamed for introducing inferior fittings that have not been specified, the expense of which may fall upon him.

A very important part of every specification are the conditions which usually precede it. From what we have said, the specification should include every particular about which the drawings and quantities give no information, and it is usual to introduce a clause in properly drawn-up conditions, to the effect that the drawings and specifications are to be taken together, and that their true intent and meaning are to be considered, whether or not any particular works are described or shown. What constitutes a set of conditions we may discuss another time; but it is important to remember the conjoint effect of the several documents which go to form a contract. A contract to build and complete a house, according to a specification, has been ruled to be binding on the contractor, though certain details are omitted; thus, in the case of Williams v. Fitzmaurice, the scantlings of the joists for the floors were specified, but no mention was made of the flooring. It was decided that the specification ought to have been coupled with the agreement, and that no extra charge could be made for the flooring. Too much stress, however, must not be placed upon this decision, as there are many other decisions by which the architect has been held liable for omissions. Although not so debatable a question as quantities, it is equally important, and much of the architect's time, trouble, and anxiety, may be saved by a complete and accurately-worded specifica-

tion, and it is a subject which concerns not only the architect and his employer, but the quantity-surveyor. Very many, indeed, of the deficiencies in bills of quantities are due to carelessly-written specifications, which often become the chief guide to the meaning and intention of the architect. On the other hand, the architect owes often much to his colleague, the surveyor, for checking and supplying the necessary amendments, and we need hardly add that, in many cases, the specification would be quite unintelligible and worthless, without the fully-written quantities with which it is accompanied, and which often reflect much credit on the care and unwearying assiduity of the surveyor.

THE QUESTION OF "QUANTITIES."

THIS question of quantities formed the subject of an important discussion at the recent Conference, which was fully reported in these columns. Its legal aspects were dwelt upon by several speakers, but, of course, without any very definite result. From this point of view an ounce of practice is, indeed, worth a ton of theory; and, seeing that these disputes have but too often to be settled by courts of law, the case of "Evans v. Carte," which came last week before the Queen's Bench Division, is most instructive, and affords a good opportunity for a few comments upon the question of quantities looked at legally. It is true that this case really turned upon a conflict of evidence as to whether an actual authority was given by the defendant; but upon the application for a new trial, the judges made some remarks that touch the root of the matter, and may fairly be taken as a warning. The action was brought by the plaintiff, as quantity surveyor, to recover from the defendant, as employer, the sum of £132 for reducing the quantities upon plans for a theatre, which the latter was about to build, but which had, somehow or other, gone off. Mr. Carte, it seems, had employed Mr. Emden as his architect, who, in his turn, and following the usual practice, had employed the plaintiff to take out the quantities from his designs for the playhouse. For this Mr. Evans had been paid his charges of £342 by the defendant without any dispute. But, when he found that the estimates were too costly, Mr. Carte was dissatisfied with the plans; and, in the end, the plaintiff was employed by Mr. Emden to reduce the quantities for his modified plans, for which he charged the sum mentioned. The defendant, however, disputed his liability, on the ground that he had given his architect, with whom he has since been at law, no authority to employ the plaintiff on the second occasion. At the trial, Mr. Emden, as a witness for the plaintiff, supported his contention, while Mr. Carte gave evidence to the contrary. Mr. Justice Bowen, in summing up, said the question was whether there had been an actual authority from the defendant to get the estimates reduced, and upon this the jury found for the plaintiff. There was then a motion to set aside this verdict as being against the weight of evidence; but it failed, and so the verdict still stands.

We are in no way concerned with the rights or wrongs of this dispute, for that is a private matter, and we are only dealing with the public interest in the principle that was involved. But it is most likely that the jury were much impressed by the fact that the defendant had paid for taking out the quantities, and that they were thus led to think he also gave authority for their reduction. They seem also to have been affected by general talk about the custom in such cases, although the judge rightly told them that this had nothing to do with the matter, and that the question was purely one of actual authority. Although the judges refused to set aside the verdict, they clearly did so with some hesitation; and, indeed, Mr. Justice Bowen himself thought the jury were wrong, while Lord Coleridge spoke still more strongly to the same effect. From this it would appear as if the evidence of an actual authority having been given by the defendant were decidedly weak, and had been by no means satisfactory to the trained intellects of lawyers. But then there was the professional practice of surveyors, or, as it was called, the "custom," and this clearly helped greatly to incline the balance in the plaintiff's favour. For this reason it is well briefly to examine upon what legal foundation this claim to a custom is based, especially as Lord Coleridge in the course of the argument went out of his way to deny its existence in the eye of the law, and to attack the whole subject most vigorously.

In the case of "Moon v. The Guardians of Witney Union" (3 Bing., N.C. 814), which was decided as long ago as the year 1837, it was held that architects have, by custom, an implied authority to employ surveyors to take out the quantities for buildings, the plans for the erection of which they have prepared. This decision is frequently quoted, and it was referred to at the recent Conference, and spoken of as being the "sheet-anchor" of the quantity surveyor. But the case itself, when closely examined, hardly bears out the usual statement of its effect; and it is, moreover, an old authority which may not nowadays be followed. As to the facts of the case, it must be borne in mind that the plaintiff did not really rely upon or succeed because of the custom he alleged. It was proved by his evidence that the solicitor of the Union had been informed that the quantities would be taken out by a surveyor, and it was also further shown that when the architect sent in the surveyor's bill with his own, the Union did not at once repudiate their liability. It is quite clear that these two facts weighed heavily in the plaintiff's favour and with the Court, for they went far to support the contention that the plaintiff had worked under an implied authority from the defendants. Nor must it be forgotten that, even in this case, the court, while admitting that there was some sort of custom, also held that this custom must always be proved by proper evidence. In the later case of "Taylor v Hall" (4 Irish L.R.C.L), which was decided in the year 1869, this point appears more plainly, for there one of the judges held that there was no sufficient evidence of any such legal custom as that relied on by the surveyor. It is true that the plaintiff succeeded on the ruling of another judge that the architect had an implied authority to employ a quantity surveyor. But there is obviously some difference between an implied authority and a settled custom, as the former may always have to rely upon the evidence in each case, of which the latter would be independent. Such, however, is the somewhat uncertain state of the law as to the right of a quantity surveyor against an employer when the proposed building has gone off, and assuredly the case of last week does not make his legal status any more certain or satisfactory.

Lord Coleridge, when this point of custom was pressed upon him on behalf of the plaintiff, and as helping to support the verdict, said that, apart from actual contract, it was "quite monstrous" that the employer should pay for the quantities, or, as he put it, should pay for what it is the duty of the architect to do. But this way of looking at the matter is neither logical nor conclusive. Many architects do take out their own quantities, and especially in the country. This plan, however, is objected to by a large class, who prefer that a surveyor should be employed for this purpose, so that the architect may be perfectly independent. If, then, a surveyor is employed, he must be paid for his services by some one, whether the proposal go on or go off, and here we come upon the real difficulty. As the Chief Justice said, the builders have to make their tenders upon the plans, but, before doing so, they must know the quantities they represent, and he asks: "Why should the architect's employer pay for them?" On the other hand it may be urged, with at least equal force, Why should the architect himself be liable? And the answer is as hard to find in the one case as in the other. Referring to his experience of these disputes, which are common enough in Westminster Hall, Lord Coleridge pointed out that it had never been suggested that the employer could be directly liable to pay for taking out the quantities, except upon the ground of some custom or contract. Of course all questions of contract depend upon the facts of each particular case; but the question of custom is of more importance, inasmuch as it has a general application. With needless sarcasm, the Chief Justice stated that architects have sought to support a custom for the payment of their commission upon work subsequently executed from the plans of another, but for which they had originally drawn designs; but this matter does not affect our present purpose. It is clear, however, from the language of the judges, that the "sheet-anchor" of quantity-surveyors would not reckon for much in courts of law nowadays, and assuredly would not be followed, in the Queen's Bench Division at least, to the extent to which it is quoted as a leading authority. It may be taken as a generally true observation that laymen talk too lightly of a "custom," in the sense in which that word is used by lawyers. A legal custom must be plainly proved to be the universal and well-known practice of a particular profession or trade, and it must further be reasonable in its scope and effect. This way of looking at the point shows how unsafe it is to rely upon any shadowy custom when a contract can be obtained. Legally speaking, a custom raises an implied contract which the law makes for parties; but it is always better for the parties to make their own contracts and not to wait for the law's intervention, as it is both expensive and unsatisfactory. For these reasons, then, the view which was strongly urged at the Conference, that the payment of quantities should be matter of contract, has our firm support, and especially now that courts of law seem likely to look rather closely at the evidence for every so-called "custom" of the profession.

GERMAN, FLEMISH, AND DUTCH PAINTINGS.*

ANOTHER of the illustrated text-books of art, edited by E. J. Poynter, R.A., has been issued, treating of the German, Flemish, and Dutch schools. The present work is written by Mr. H. J. Wilmot Buxton, M.A., and is a valuable addition to the series now in course of publication. We have already noticed the volumes treating of Classic and Italian painting, and Gothic and Renaissance architecture, and the arrangement followed in the first of these has been observed of dividing each school into chapters, the leading names of painters and their followers being inserted in chronological order. The introduction sketches briefly the progress of art in Germany and the Netherlands. The Byzantine monks were the introducers of art to the inhabitants of Northern Europe, but no trace of painting

* German, Flemish, and Dutch Paintings. By H. J. WILMOT BUXTON, M.A., and EDWARD J. POYNTER, R.A. London: Sampson Low, Marston, Searle, and Rivington, Fleet-street.

THE FOUR RIDERS OF THE APOCALYPSE. BY CORNELIUS.

Designed for the Campo Santo of the Cathedral at Berlin.

appears before the introduction of Christianity. The author alludes to the period between 1150 and 1250 as that of a new and vigorous life in art, when legends of heroes, the stories of Charlemagne, Arthur, and the traditions of the Niebelungen furnished the painter with new themes, and took the place of much of the earlier subjects of a sacred character. A very fine wall-painting in the cathedral of Gurk, in Carinthia, of the Madonna and Child (engraved) shows a relaxation from asceticism and the stiff figures and draperies of Byzantine work; and wall-paintings became a favourite means of exercising the painter's art in the Netherlands. Book I. opens with a sketch of the German School from 1350 to 1450. The art of the past, wrapped up in ignorance and superstition, was giving place to a more vigorous conception, fostered by the revival of learning and the spirit of inquiry which now began to dawn, and the author shows how this spirit influenced art and disenthralled her from the dominion of the church. The wall-paintings of the School of Bohemia, which dates from the middle of the 14th century, constitute the principal work of the earliest painters of Germany, but these are scanty, and after a brief reference to them, the reader passes to the works of artists who lead the way to the age of Albrecht Dürer and Holbein. Martin Schongauer, Schaffner, Wolgemut, are among the artists noticed of this early period. A newer life was kindled by the Reformation, and, unlike the Italian schools which accepted the teaching of Greece and Rome, those of Germany became the exponents of the new faith. Albrecht Dürer, the "Evangelist of Art," as he is called by the poet, and a versatile genius, forms the subject of a chapter which is illustrated by his portrait, painted by himself, the four Apostles, St. John, St. Peter, St. Paul, and St. Mark, in the Pinakothek at Munich, considered his masterpieces, besides a fine wood-engraving representing the "Adoration of the Trinity," another of Dürer's celebrated works displaying, as the author justly says, the many-sided forms of Dürer's genius, the real and ideal, the sublime and grotesque. A brief notice follows of his pupil Hans Burckmair, and a fine wood-engraving of his picture of himself and wife is given, also of two other pupils, Hans Fuss and Hans Leonhardt Schäufelin. Barthel and Hans Sebold Beham are mentioned among the "Little Masters," who followed Dürer, and examples are given of their works. In this band was Altdorfer, the creator of landscape-painting, and a skilled architect. Contemporary with Dürer, was Lucas Cranach, a painter, one of the School of Saxony, and an excellent engraver. Hans Holbein, the other great light of German art, and his successors, are noticed briefly, and two examples of his work are given, after which the author devotes a chapter to the decadence and revival of German art. The very "versatility of Dürer prevented him from forming a school. His imitators copied with more or less success his various styles, and thus diverged widely in different directions." Among the revivalists of art in Germany, the name of Overbeck is foremost, after which Peter Von Cornelius must be mentioned as one of the greatest painters of compositions. He was born at Düsseldorf, in 1783. With the publishers' permission, we reproduce above the engraving of one of his finest compositions, "The Four Riders of the Apocalypse," designed for the Campo Santo of the cathedral at Berlin. The composition is grandly grouped; the figures of the riders and their victims are finely modelled, and graceful in the drawing, and we are tempted to compare the design with the work of Albrecht Dürer, representing a scene from the Apocalyptic vision, where "Death" sits on the Pale Horse, killing with "sword, and with hunger, and death," a very fine illustration of which we reproduced in the BUILDING NEWS of August 4, 1876, Vol. XXXI. It is quite evident Cornelius endeavoured to emulate the grandeur of conception of Dürer's work, though his drawing is more academic in feeling. He painted, besides Scriptural subjects, scenes from Homer, Dante, Göthe and the Niebelungenlied. Besides Cornelius, Wilhelm von Kaulbach, the great historical painter, and Carl Friedrich Lessing, may be mentioned among the school of revivalists. It is very true that the German artists fell into the opposite extreme of the Dutch—namely, of being unable *to realise* the ideal. Flemish painting is treated in the same exhaustive though necessarily brief way. The "School of Bruges" (1366-1550), of course describes the leading painters. Huibrecht van Eyck's "Choir of Angels," in the upper wing of the polytych in St. Bavon at Ghent, is a remarkable and feeling work of this great school. We have also an illustration of a work by a pupil of Jan van Eyck, Rogier van der Weyden "The Adoration of the Kings," in the Munich Gallery, and a fine portrait by Hans Memling, one of Weyden's greatest scholars. The "Reliquary of St. Ursula," the best-known work of this master, has been illustrated frequently. It represents a small, ark-like shrine in Gothic. The panels have small pictures by Memling, representing the Madonna and St. Ursula, with the story of the latter virgin. The School of the Netherlands (1466-1600), the centre of which was Antwerp, is fully described and well illustrated by the works of Quentin Matsys, after which art in the Netherlands began to decline by forsaking the truthful objects of their national life to imitate the beauties of the Italian schools. The realistic style of the Flemish painters was quite unsuited to represent the ideal of the Italian masters, and so, as in other schools, art fell. Rubens commenced the revival of the art in the Netherlands, as he was its greatest master (1600-1700), and a chapter is devoted to his principal works. His pictures of himself and Helena Fourment, "Descent from

the Cross," at Antwerp, and two other subjects are engraved in good style. The author alludes justly to the absence of *soul* in the work of Rubens. "There is a healthy animalism pervading his works, which however much in keeping with the picture of a grand old lion, or a naked, coarse-limbed Flemish woman, is out of place in tragic or domestic scenes—scenes which Rubens delighted to paint." Sir Joshua Reynolds's estimate of him, that he was the best workman with his tools that ever managed a pencil, is certainly a just one: his work is always beautiful, but soulless. The author compares the contemporary art in Holland with that of Rubens. While the latter drew his subjects from the historic themes of the Catholic Church, the former sprang freely out of national freedom and every-day life, "and their religion, when there is any, is the religion of the Reformation." A fine work by F. Snyders of "Dead Game" is given. Van Dyck displayed the feeling which his great master Rubens was deficient in, and his Crucifixions and sacred subjects are therefore more pleasing. Two examples are given of him; after which the other followers of Rubens are chronologically referred to, among them David Teniers, the elder and the younger. The last was the greatest *genre* painter the Netherlands produced, and two good engravings are given of his style. Sir Peter Lely, the painter of the Court beauties of Charles II.'s court, is represented by the portrait of the Countess de Grammont, now at Hampton Court. Book III. treats of the Dutch School (1450—1700). We find the leading painters are slightly touch upon, and their characteristics pointed out. A realism approaching the grotesque is a peculiarity of many of the leading artists, as Lucas van Leyden. The greatest painters lived during the later years between 1584, the birth of Hals, and Jan Van Huysum (1682). Dutch art was contemporaneous with Dutch freedom: its aspirations were sometimes low and sensual, but always truthful to nature. With the ideal and spiritual it had little to do: the landscapes and sea-pieces show the realistic nature of the art, though there is often a good deal of feeling expressed. We can only refer to the admirable choice of engravings illustrating this school, showing works by Hals, Rembrandt, Mierevelt, Bol, Nicolaas Maes, Livens, Brouwer, Adrian Isaac van Ostade, Van der Helst, Dou, Mieris, Metsu, Jan Steen, Meer, Van Goyen, Cuyp, P. Rotter, Wouverman, Ruisdael, Hobbema, Adrian van de Velde. Painters of domestic life, landscapes, marine views, and architecture and still life are separately treated. In the last mentioned we may name Muraud, Van der Heyde ("the Gerard Dow of architectural painters," De Witte, Pieter J. Saenredam, Van Huysum, &c. The work is neatly printed and tastefully bound, and we can recommend this volume to students and collectors of works of these schools as a very compendious guide and handbook for reference.

ST. PAUL'S ECCLESIOLOGICAL SOCIETY.

THE members of this Society visited, on Saturday afternoon, the parish-churches of Pinner and Ruislip. The attendance of members was not so numerous as at many of the former out-of-town visits, probably because the district has not been so well made known by illustrations, but the leading features of the churches seen were clearly explained, and the afternoon was one of considerable interest.

PINNER.

After a long and dusty walk from the station, the parish-church was reached, and the visitors were received by the vicar, the Rev. Dr. Pinnock, who read extracts from an old description of the building, and a newspaper report of the reopening service held a year since. The church is of the Decorated and Perpendicular periods, and is built of flint and Totternhoe grey-grit stone; it consists of broad nave and aisles of five bays, separated by octagonal columns, having good bases and caps, south porch, west tower of the Middlesex and Herts type, shallow transepts extending just beyond the general building line, chancel, and large south choir-aisle; the outside dimensions are 120ft. 6in. from east to west, and 53ft. 8in. across transepts. Records show that the church was built in 1321, as a chapel to Harrow, and it is dedicated to St. John the Baptist. The traceried windows are Early Decorated, those of the aisles Perpendicular. The best feature in the church is the excellently-moulded and proportioned tower-arch. The restoration of last year was carried out from the designs of Mr. J. L. Pearson, R.A., by Messrs. Well and Hook, of Brimscombe, Gloucestershire, at a cost of over £4,000, and the building is now in a thorough state of repair. The works included the erection of new roofs in pitch-pine to nave and chancel, and repairs to other roofs, the enlargement of the south chancel-aisle (built in 1859 for the accommodation of the children educated at the Pinner Commercial Schools), and the rebuilding of vestry on north in stone, and repairing of east end and protection by a dry area, restoration of tower and replacement of Tottenhoe by Bath stone in doors, windows, and parapets, while new reredos, Communion-table, choir-stalls, pulpit, organ, and stained-glass west and north windows were added to the church fittings. In the nave roof are two new dormers of carved oak on either side. A paper written by Mr. Albert Hartshorne was read, in the author's absence, by Mr. A. Paxon, hon. sec. of the Society. The writer remarked that it would be at once apparent to visitors to Pinner church that there was nothing there earlier than the 14th century, and that the features of this period even were to be found not as might be expected in the south wall of chancel, but in the nave arcades and transepts. The moulded caps of the arcades were of so distinctive a character that they carried their date clearly on them, that being the latter part of the first quarter of the 14th century. The transept windows plainly indicated the same period. Upon the opinion that the mouldings and other details of Pinner had a very close resemblance to those at Harlestone Church, Northamptonshire, built two years later, the theory had been based that they were the work of the same builder. There was a marked similarity between the mouldings of arcade capitals in the two churches, but it was quite fortuitous, he believed, and proved no more than the general unfolding of the mysteries of the Gothic style throughout the country. The styles of Northamptonshire and Middlesex were the same, and the details resembled each other; but the character in each district was distinct, a distinctness due to the difference of the building materials. In Northamptonshire they formed noble towers and nobler spires all of stone, entire churches, generally with low clerestories and with vast naves and chancels, all built in good stonework, and the finest following the course of the rivers. In Middlesex they had towers verging on feebleness, insignificant wooden spires, rubble walling faced with flint or plastered, wooden dormers as clerestories, and ashlar work of the smallest possible extent in clunch, Totternhoe stone, or alluvial boulders. The churches of Middlesex as a whole were not notable examples of architecture, but some possessed a high interest. Such a one was that of Pinner, where the plan, as it was left by the Perpendicular builders who rebuilt the chancel and added the tower, was well worthy of consideration if not of imitation. The transepts were not too deep, the aisles not too wide, the chancel not too long, and the proportions of nave and arcades were admirable; when it possessed its rood-screen the building must have been a rare and picturesque example of a parish-church. The 14th and 15th century stone details inside the church were all good of their kind. There was not a splinter of the old fittings remaining. The whole church, the writer continued, had lately gone through the process, certainly under a master-hand, of what was mildly called "restoration." The urgent spiritual needs of a rapidly-increasing parish had, however, been met in a munificent manner.

RUISLIP.

A pleasant carriage-drive of three or four miles along a country lane brought the visitors to Ruislip Church, which was pronounced well worthy the excursion. The parish-church was formerly annexed to a priory suppressed early in the thirteenth century, and is dedicated to St. Martin; it is an aisled church of wide span and good proportions, having a fifteenth-century tower at west-end of south aisle. At this church Mr. G. H. Birch, A.R.I.B.A., acted as guide, and remarked that the history of the parish went back to very early times, and that its name was one of those mentioned in Domesday Book. The church in which they were assembled was an exceptionally fine and spacious example of a Middlesex church. The earliest feature in it was the Purbeck marble front, which was a heavy bowl set on cylindrical pillar, and dated from the latter years of the eleventh or commencement of the twelfth century. In the thirteenth century the church was entirely rebuilt, but the only remains of that alteration were the arcades on either side of nave, supported on alternating round and octagonal pillars with deeply channelled mouldings. The chancel-arch was similar in character at first sight, but the Decorated mouldings indicated the date of Edward II. In the fifteenth century the narrow aisles to nave were replaced by wider ones, that on the north side being the later of the two, and both aisles retained the roofs erected at that period, the carving in the north aisle being exceedingly good. The tower was of this period, and also the east window, and entrance to former rood-loft. The internal walls of the church were formerly covered with fresco paintings, sufficient traces of these remaining to show the former magnificence. The most complete portion still visible was on east wall of north aisle, in which the Weighing of the Souls was represented, and beneath this subject, St. Lawrence. A few remains of the 16th century seating, and a typical Jacobean pulpit, represented the post-Reformation alterations, while in the chancel were some good brasses (1593-1600), and mural memorials to members of the Hawtrey family, for many generations prominent in the locality. The members then examined the church in detail. Some severe comments were made concerning the prominent lettering just added in the south panel of the new stone reredos: "— ———, Esqre, architect," the full London address being added.

On the return to Pinner, tea was partaken of at the Cocoa-tree Tavern, the first coffee-house established in England, and the members of the society afterwards accepted the invitation of the proprietor and founder, Mr. W. Barber, to visit his grounds at Barrow-point. During the past few years, the following buildings at Pinner, all erected from the designs of Messrs. Ernest George and Peto, have been illustrated in the BUILDING NEWS: The Cocoa Tree, March 8, 1878; Barrow-point and cottages for Mr. Barber, July 4, 1879; and Haydon lodge and cottage, for Mr. L. J. Baker (two plates), July 2, 1880.

BEER STONE.

AN interesting pamphlet on Beer Stone, by Mr. P. Masey, architect, has been sent to us.

It having been proposed to use Beer stone in the construction of an important building in which Mr. Masey was interested, and having no actual knowledge of the nature of the stone, he resolved to visit the quarries and to inspect buildings where it had been used, and so form an independent opinion of the capabilities of the quarry and the quality of its produce. Beer is a fishing-village on the south coast of Devonshire, towards its eastern limit. It is about 150 miles from London, and is readily gained by the South Western Railway and the Seaton branch line. The quarry is entered by a gloomy archway, and extends, it is said, a quarter of a mile underground, at a depth of about 300ft. from the surface. The caves are both dark and wet, and form a mysterious labyrinth, where, without a guide and lights, a visitor would be quickly lost. There is so much *débris* accumulated that it is difficult to tell the original height; Mr. Masey supposes it to be about 20ft. In one part is a square chamber, cut with a sort of quadripartite vaulting. It has been supposed that this was a chapel in olden time. From this quarry, for probably a thousand years or more, stone has been excavated, and the supply is practically inexhaustible.

The freestone consists of beds which lie at the

junction of the chalk and the green sand, and is principally composed of carbonate of lime. Of late years, it has been thought more convenient to quarry in the open, and at a short distance from the entrance to the old quarry a new quarry has been made, the superincumbent strata in this latter being burnt for lime. It is this fact of making available the waste, or what is such in other quarries, that enables this stone to come into the market at so reduced a price; at least, this is one reason. A small attempt has been made to quarry on the sea-face of cliff. Though extensively used during the middle ages, not only in the neighbourhood but at considerable distances (it having the advantage of easy shipment and water carriage), yet from various causes—chiefly, probably, the apathy of the owners and the cheapening of other stones having railway facilities, such stones being energetically pushed forward to notice—the Beer quarries had almost fallen into disuse and the stone well-nigh forgotten, the stone being got mainly for the purpose of burning into lime for local agricultural use. Such stone as was sold for building purposes was unselected, and possibly not of the best quality.

The opening of the Seaton branch line of rail now enables this stone to reach London and other inland towns; and the new owners of the quarry being disposed to actively push the sale, the probability is, Mr. Masey thinks, that, however extensively it was used in Mediæval times, it will still be more generally so now, its relative advantages being so great. The stone is of whitish brown tint, is a limestone, and most easily worked. The beds vary in depth from 2 to 10ft. The best beds form an aggregate thickness of 30ft. Blocks can be obtained of many tons' weight, the difficulties being only mechanical ones—6 to 8 tons are usual. In some of the beds organic remains are found, small bivalve shells, belemnites, sea-urchins, slugs, and sharks' teeth.

Having inspected the quarries, Mr. Masey next turned his attention to the churches of the neighbourhood. He visited Exeter Cathedral, and many of the city churches; also Whimple, Tallaton, St. Laurence Clist, Clist-Hydon, Awliscombe, Payhembury, Buckerell, Feniton, Musbury, Seaton, Branscombe, Axmouth, Axminster, Lyme Regis, Ottery St. Mary, Honiton, Colyton, Chard, Broad Clist, Uplyme, Combpyne, Charmouth, and Shute. In all these churches Beer stone had been used for exterior dressings and interiors generally, at dates ranging from the 11th to the 16th centuries. The condition of the stone was found to be generally good; mullions of windows in some cases had failed through not having had the stone set in its natural bed. As regards natural decay, the stone had stood well, though, of course, it had suffered from wanton violence, no buildings being so subject to ill-treatment as churches. Many of these churches had portions of the 13th century. At Axminster, Axmouth, and Lyme Regis, are Norman parts.

The Beer stone was used in the cathedral of Exeter from the Norman period downwards, mostly for interior work. The beautiful series of piscinæ in the chapels, of Early Decorated date, are in this stone. In the Cathedral Archives, the stone is mentioned in 1427 to 1434, and the stone so specified is said to have been used for building the chapter-house, necessarily the upper portion of it, the house being of the 13th-century style. So far as this Perpendicular work can be judged of from a distance, it is in a good state, showing that the stone is able to withstand a city atmosphere. A more convincing testimony of this quality can be seen, however, in the little and sadly-neglected church of St. Pancras, in Pancras-street, Exeter. The chancel, of 13th century date, has one side in a stable-yard. The windows—couplets with quatrefoils—are only about 3ft. from ground to glass line, and, therefore, easily examined; and though from such position much subject to injury, yet the stonework of these windows gives conclusive evidence of its good weather qualities, the date being plain and the fact positive also of the church not being restored.

Next to the Cathedral of Exeter, the most interesting church in the county is St. Mary Ottery, a miniature copy of the cathedral. A great part of it is of the 13th century date, the whole of which is in excellent condition. This church was restored by Mr. Butterfield a few years since, but the lichen-covered state of the stone in exterior seems to show it is not modern. There is an exterior Norman doorway at Axminster Church, at the east end of south aisle. It is in fair condition as regards the effects of time. It is not, however, in its original position, as the archæologist will at once perceive—old builders never putting east entrances—rebuilding has injured it. The exterior stonework of most of the other churches was of Perpendicular period, and generally good. Smeaton mentions the mossiness often seen on the stone, and shrewdly observes that it is no proof of decay. The so-called "mossy coating" is a growth of lichens, &c., which evince a partiality for the Beer stone. A remarkable specimen exists at Honiton Church, on the outside of the doorway and turret to the rood-loft. Mr. Masey supposed the stone had been painted in distemper, so positive was the red colour of the stonework, and he insisted, when speaking to the sexton, that it must be so. The sexton was, however, equally positive to the contrary, and only on a second and more minute examination did Mr. Masey find that the colour was a vegetable growth. The west doorway of this church is a peculiar specimen of the stone, it looking as if whitewashed. This is occasioned by small pellicles falling from surface, the only instance Mr. Masey met with of it. The stone is not set on its natural bed, and the church is about to be restored.

Axmouth, a small 12th-century church, has pointed arches to nave, but round arches springing from nave-piers to aisle-wall. Branscombe Church has tower, 13th century, at crux; has remarkable fall in the interior of sills to westward of chancel windows. Colyton is a good-sized church with octagon tower on intersection of cross. Here is a monument to a granddaughter of King Edward III. of Beer stone, in good condition. A base vandalism was committed in re-glazing the west window. The window, a particularly fine example of Perpendicular work, with the western doorway incorporated in design, had peculiar multiform cusping. In substituting square panes of glass for the old diamond quarries, the glazier discovered that his work would not work in with the cusping. The simple remedy was adopted forthwith of cutting out this beautiful cusping, and so maimed it must always remain now. Owlesford has a groined porch, with the unusual feature of an archway westward as well as to the south. Here is also a remarkably perfect rood-screen of Beer stone, looking as perfect as if just executed, though of the 15th-century date. At Clist St. Lawrence is an interesting churchyard cross, singularly, on the north side of the church. Broad Clist is a handsome Perpendicular church. The tower buttresses have animals on buttress slopes; here also is a churchyard cross. Axminster has an ornamental Norman doorway, supposed by the local authorities to be Saxon, piscina and sedilia and recessed tomb in chancel of 13th century. Combpyne has a pretty little piscina and corbel to arch of the 13th century.

Most of the churches have good rood-screens of wood, and generally boarded waggon-headed roofs with moulded ribs, but thickly covered with whitewash. At Lyme Regis the present church is built on eastern end of former one. Only two of the above-named churches have old fonts. In Exeter Cathedral the old font is gone, but there is a good modern one of handsome appearance, which the Dean, however, has cast out in favour of a small, ugly, Classical thing once used by royalty. Musbury Church has a remarkable monument of the Drake family of the Elizabethan period. The figures being full-sized and coloured, produce a striking effect.

The churches named are probably but a comparative few of the whole number where Beer stone was used.

There was a most remarkable example of the use of Beer stone in London, evidencing its endurance, but, it cannot now, except by name, be said to exist. This is the Royal Chapel of St. Stephen's, Westminster. Mr. Masey inspected it in 1844, and was both surprised and delighted by its excellent condition. Whilst examining it, an official came up, and not only forbade copying the mouldings, but had the impudence to take away Mr. Masey's companion's sketch-book, asserting that it was Mr. Barry's orders. Mr. C. H. Smith, who read a Paper about the year 1850, says of the crypt, that its "carved ornaments and mouldings were in a most excellent state of preservation"; but he makes the mistake of supposing the chapel to be of Caen stone. He also is wrong in speaking of the cloister as of Caen stone. Mr. Jones, the resident surveyor at the Palace, informs Mr. Masey that the old stone in the cloister is Ryegate. Mr. Masey asserts the stone of the chapel to have been "Stone de Bere," as the rolls term it, because of its whitey-grey colour. It always shows whiter than Caen stone. In the last edition of Gwilt's "Encyclopædia," Beer is mentioned as the stone used for this chapel; and, moreover, it would be utterly incomprehensible to suppose it to be Caen in such excellent state when, close at hand, there was work of the same date, and even much later, of Caen stone, yet in a pitiful state of decay. Mr. Masey alludes to the Abbey Church. Sir Christopher Wren, nearly two hundred years ago, speaks of the condition generally of the Abbey, cased with Caen stone, as being decayed 4 inches deep, and of Henry VII.'s Chapel as "a nice, embroidered work, performed with tender Caen stone, and, though lately built in comparison, is so eaten up by our weather that it begs for compassion." With such positive testimony as this of what was undoubtedly Caen, it is certain that the stone of the chapel was not Caen. Though the crypt exists, it has been cased inside and out, and can give no testimony now as to the old material; but alas for the claims of Caen, for with this it has been restored, so to speak, and, in spite of protective composition laid on it, it is now decaying, though only done about fifteen years. But bad stone is not the only fault in this work. It might rightly have been expected that, in a restoration in these latter days, the important peculiarities of the old masonry-work would have been copied. It should have been. Mr. Masey says, however, that the arches have key-stones instead of joint at apex, and that the label is cut out of same stone as the arched head, wastefulness of material, time, and labour not committed by the craft in the olden time. They were sometimes profuse, but never wasteful.

Beer stone has these special advantages—agreeable appearance, fine grain, especially fitting it for delicate carving, and easiness and cheapness of working. It is, according to Mr. Masey, beyond rivalry, the cheapest stone in the market. Its durability for interior work is undoubted, and for exterior purposes it at least is better than many, and, equal to any.

Its cheapness is owing to two circumstances: one, that the waste, or what is such in other quarries, is utilised at Beer by its being burnt into lime; the other is the advantage of possessing now cheap railway carriage. Its convenience for shipment in the middle ages enabled the stone to be used so generally, and, should the modern demand for the stone warrant the formation of a pier to load from, water carriage would again be resorted to. Thus the stone would reach the London market at 1s. 2d. per foot. Even now, the price at Nine Elms Station is but 1s. 4d. a foot, or ½d. less than Bath stone. The cost of working is one half that of Portland, as given by Laxton; and one builder at Exeter avers, that in his experience the expense of working is less than Bath. Cost is still further lessened if the stone is worked at the quarry.

Beer stone is less than half the price in block, and but half the cost in working, so that for the same money you can get four times as much work done in Beer to what you can in Portland. By tests performed at Messrs. Kirkcaldy's Works, Oct. 20th, 1879, the strength of the stone was beyond question. The particulars are appended.

It will be seen that a cube one inch square bears a stress of	2·106lbs.
Portland stone, according to the Royal Commissioners' Report, bears	2·125lbs.
Bath stone ditto ditto ditto	1·275lbs.
Caen stone, as quoted by Mr. C. H. Smith, ranges upwards from.....	·577lbs.

By these tests we see demonstrated that the stone has about the same strength as Portland, and double that of best Bath stone.

THE STONE FOR TRURO CATHEDRAL.

THE adjourned meeting of the Cathedral Committee, convened for the purpose of deciding what stone shall be used in the construction of the new edifice, was held at Truro on Friday, under the presidency of the Bishop. The chairman of the committee, the Earl of Mount Edgcumbe, wrote suggesting that a small sub-committee should be appointed who should be asked "to obtain further and more

accurate information about the various Cornish stones, which are referred to in Mr. Pearson's report, with special reference to the quantity available, the cost of delivery at Truro, the durability of the stone as evidenced in buildings in Cornwall, and its adaptability for particular work in the Cathedral." Although he held a very strong opinion as to the desirability of Cornish material, and of a design suited to it, and had been one of the minority at the outset, he urged all to waive their individual predilections, and whatever the decision might be, to give the executive their unanimous support. It must be regarded as out of the question that the first principles of the design should be criticised, now that the working drawings had been made, and the building itself commenced. Mr. J. L. Pearson, R.A., also wrote that he was as anxious as any Cornishman could possibly be to use the native stone for the Cathedral, and that it would be monstrous to suppose that he could desire that the work should be done in a material which should not last during his own time, as some seemed to believe. The St. Stephen's granite could not be called a good weather stone, although it might be used for some parts. The Elvan stones, even when rightly bedded, often decayed, as could be seen in the old church at Truro; and local architects and builders used but few of the Elvans for moulded work, employing instead St. Stephen's or other soft granite. Even if all moulded work were got rid of, and all angles of windows, &c., were made perfectly square, constructions in Mabe granite would cost nearly double that in Bath stone. Much had been said of the uncertainty of Bath stone; but no quarry yielded uniform material, and the objection applied to all stones with equal force, and he could give a long list of buildings all over England where Bath stone had stood equally well throughout. The only compromise he could suggest would be to use St. Stephen's granite for all plain surfaces and buttresses, and some of the Elvans also for plain surfaces if they could be got, and at a cost not exceeding Bath stone. If the committee would leave the matter to him, giving general instructions on the subject, their confidence would be valued and would not be found to be misplaced. Referring to the correspondence which had taken place, Mr. Pearson added that the clerk of works, "Bubb, will report to you what took place at a meeting of a sub-committee when Mr. Clarke was there to give an account of the stones he advocated. All the facts which have come out with regard to these local stones would be very amusing did they not produce feelings of great pain and indignation that so much should have been said so utterly regardless of these facts, and well-known facts, too."

Mr. W. Bolitho proposed that Lord Mount Edgcumbe's recommendation to appoint a small sub-committee be adopted. This was seconded by Mr. Chirgwin, and having been supported by several speakers, was unanimously agreed to.

During the past week, many letters have appeared in the Cornish and Devonshire newspapers, in addition to those we summarised in our last issue. Mr. Richard Tangye, of Gilbertstowe, near Birmingham, has strongly condemned the proposal to use a stone like that of Bath, which would crumble in a few years, and added that although as a Quaker he still declined to contribute to the cathedral fund, he willingly offered £25 towards the extra cost that might be involved by using the stones of Cornwall. Mr. Harry Hems, of Exeter, shows that the question resolves itself into one of cost, and that unless additional money be subscribed by those who advocated the use of local stone, the oolite, which is cheaper and more easily worked, must be adopted. Another writer, "C.," remarks that Mr. Pearson has not proposed to use "Bath stone" usually so called, but the harder and more enduring Doulting or Stoke-ground stone, which could be sawn into cubes with a total absence of the waste of material on the site characteristic of stones requiring chisel and mallet. "Observer," writing from Camelford, suggests that as oolitic stone decays in consequence of water being absorbed by the pores, the material could be safely used at Truro if after carving and setting, the chinks in the stone were closed by a solution of bichromate and gelatine. "Truronensis" thinks it has been overlooked in the controversy that a soft stone has been used for the foundations, and it therefore becomes a question if these will bear the harder and heavier stone now proposed for the superstructure. "Cornishman" refers to the fact that the exterior of St. Mary Magdalene's Church, Launceston, is all of carved granite, and "R. T." says that St. Michael's Church, Penkivel, built from the designs of Mr. Street, R.A., for Lord Falmouth, is built of Pentewan stone, and is, he adds, likely to last for generations. "Bath Stone" cites the condition of the old church of St. Mary on the cathedral site against the advocates for the use of local material. On the south front, the fragment still standing, the lower part of the wall is of Cornish Elvans, the window tracery of oolite, and the coping of granite. The Elvans are decomposed, the granite completely honeycombed, but the oolite has withstood the climate much better. The granite of the spire was also honeycombed. As for the Seveock stone, some of the skilled stonecutters employed on the cathedral have refused to work on this stone, and the writer thinks it quite unworkable. Messrs. Pictor and Sons, Bath Freestone Works, Box, state that the different kinds of Bath stone, when properly selected for the purposes for which they are adapted, can be relied upon. For interior and decorative uses, Corsham Down is, they state, the best, as it is uniform and sound in quality, and procurable to any movable size. For the exterior Boxground is suited, its reputation for durability and weathering qualities being thoroughly established. Box Church and Lacock Abbey are referred to as Wiltshire examples of the wearing qualities of Box-ground stone. In connection with this controversy, the report of the selected architects for Redruth New Church, Messrs. J. P. Seddon, of London, and J. Hicks, of Redruth, is reprinted. They propose that the walls shall be faced, both inside and out, with local killas, elvan, and spar, disposed in bond-courses and panels; granite to be used for plain angle and buttress quoins, copings, spire, and other exposed parts, simple in character and detail. The window tracery and dressings, arches of arcade, and moulded work generally to be of Wild Duck Elvan both inside and out; the piers of arcade to be of granite, and the sculptured parts to be of Bath stone. The architects anticipate to be able by this free use and combination of local stone to erect the church at about the same cost as if they had adopted Doulting or Ham Hill stone.

ENGLISH AND SCOTTISH PROFESSIONAL PRACTICE COMPARED.

IN his valedictory address, delivered on the 23rd inst., Mr. John MacLachlan, the President of the Edinburgh Architectural Association, after dealing at some length with local matters, went on to refer to some points of general interest in connection with the recent Conference. "You are aware, no doubt," said Mr. MacLachlan, "that the Conference was a National Conference. Invitations were sent from the Royal Institute of British Architects, the most important body of architects in our country, to all the architects in the United Kingdom to attend the Conference. It is to be regretted, I think, that so few Scotchmen availed themselves of the invitation. I do not think that more than half-a-dozen from the North of the Tweed put in an appearance. This is a somewhat depressing fact to those who desire to advance the interest of our common calling. There are, I presume, nearly 300 architects in Scotland, and only half-a-dozen appeared to show their interest in, and to discuss the subjects which ought to interest us all professionally. This limited attendance of Scotchmen was all the more surprising, because our London friends had provided for our entertainment a very inviting programme altogether independent of the business of the meeting, a programme of visits to houses and churches and factories, such as one will not have an opportunity of seeing so well again.

The business proper of the Conference consisted of papers and discussions on two subjects—"Quantities" and "Competitions." In regard to the former subject (quantities), papers were read by architects and surveyors from different parts of the country, describing the methods of contracting in their various neighbourhoods. Mr. Cates, the chairman of this section of the Conference, and Mr. Sidney Young, of London, gave a description of the mode of procedure in the Metropolis; Mr. Elgood represented Manchester; Mr. Scott, Glasgow; and Mr. Morham, Edinburgh. Each of these gentlemen read papers describing the manner of contracting in his own neighbourhood, stating who employed the surveyor, to whom he was responsible, what part the schedule played in the contract, whether the bill of quantities formed or not a part of the contract, and so on. Many of the architects from the provincial towns of England, of whom there was a great number present, took part in the discussion. To those situated like ourselves, practising principally in one neighbourhood, it was amazing to find as the discussion advanced the different methods of procedure which prevailed in different parts of the country. In London it seems there is no regularly organised body of surveyors. Many, if not most, of the London architects measure their own plans. It is only those architects in the best practice who do not measure their own plans, or at least have the schedules prepared in their offices. When works are large it is customary that two surveyors be employed, each working for himself. The one is appointed in the interest of the client, the other of the builders. It is difficult to see any reason for two separate surveyors for a work, unless either on the ground of incompetency or roguery. I regret to say that in the course of the discussion Professor Kerr spoke in anything but flattering terms of surveyors in London. He said that, with some honourable exceptions, they bore a very shady reputation.

The provincial architects in England almost invariably measure their own plans. They do not generally hold themselves responsible for the correctness of the measurements, and yet they charge 2½ per cent. for preparing them, in addition to their 5 per cent. as architects. The principal reasons given by those architects present at the meeting for the course taken by them in preparing their own bills of quantities were that there were no surveyors in their neighbourhood—there was no such class of men—and to send their plans to London to be measured would be a costly and troublesome process. The second reason, and, as I suspect, the most potent one, is that taking out the quantities is the best paying part of their practice, and therefore they would be very unwilling to give it up. The third reason which, indeed, was made the principal reason by many speakers, was that nobody could take out the quantities so well as the architect, because nobody knows so well about the plans. With our experience in Edinburgh of the exact and detailed schedules of our ordained surveyors, this reason will not weigh heavily.

Our own Scotch method I need not describe at length. There is a slight difference between the Edinburgh and Glasgow methods, but it is only slight. Practically, the method of procedure is the same in the two cities. Architects do not measure their own plans. There is a separate set of men—surveyors—men of high class, whose generally irreproachable character is at stake in the correctness or otherwise of these schedules.

The schedules are prepared at the commencement of the work, and the contract is founded upon them. Should there be any additions or deductions, these are regulated by the priced schedule, which is signed by the contractor as one of the conditions of the acceptance of his offer. The only difference, as far as I could understand, between the Glasgow system and the system prevailing here, is that the 1st Schedule, on which the contract is founded, is in Glasgow more of a tentative document than it is with us. With us the 1st Schedule is a very complete and exact document, and if no alterations were made in the building, it would show exactly what would be the final cost of it. But in Glasgow the 1st Schedule is not made so complete as with us, and the result is that the works are all measured up at completion, the 1st Schedule being more as a *price list*, from which the prices in the completed schedule are got. You will thus see that the difference between our usage and that of our brethren in the west, is one more of detail than of principle. We may, to all intents and purposes, therefore, talk of our Scotch system of contracting as one, and we have no reason whatever to be ashamed of it. It bears very favourable comparison with the systems pursued on the other side of the border, where there is no body of high class professional surveyors with a recog-

nised system of measurement as with us, but where architects measure their own plans with all the loss of dignity and danger of squabbles which such a system involves; where clients are punished to the tune of 2½ per cent., while all fair men will acknowledge that, or 1½ per cent., is ample remuneration. I say our Scotch system, with its fairness to all parties—clients, contractors, and architect alike—will bear very favourable comparison with the system pursued in England. We are credited, among our brethren in the south, with a fair amount of self-complacency. They aver of us that we are so charmed with our end of the island—what Sydney Smith called our knuckle end—with all its institutions and usages, that unless a man can eat porridge, and drink whisky, and take kindly to kilts and bagpipes he is nought, that in short all usages and customs here are perfect, and ought to be imitated by all the world. Our self-gratulation is unfortunately not likely to be lowered in connection with the subject more immediately in hand—the Scotch system of contracting, with schedules prepared by respectable surveyors with whom the architect has no monetary transactions whatever, has really nothing to do except consult professionally on the work in hand. This system is rapidly growing in London, is now in use by all the best men, and I have little doubt that in course of time it will extend to all the larger towns of England, where the population and business will justify the existence of a body of respectable surveyors. We have given England many things, and I am strongly of opinion that not many years hence there will be numbered among our gifts to our richer neighbour an entirely fair and equitable system of contracting for the erection of buildings.

The other main subject of discussion at the conference was that of "competitions." I do not purpose saying much on that subject. The subject is a knotty one. The Royal Institute of British Architects are anxious to formulate rules and regulations to guide all fair competitions. Such rules and regulations are, without doubt, desirable, but the difficulty is to get such rules observed. On the one hand you have the proprietors, promoters of the building, whatever it may be, delightfully ignorant of architects and architecture, with the one idea that if they set on foot a competition with or without prizes, numberless needy architects will enter the lists and produce designs for their consideration whatever the terms may be. On the other hand, you have our whole brotherhood all anxious enough for work. It seems to me in such circumstances there is great difficulty in the first place in formulating rules to guide competitions, and in the second place, in getting such rules observed. The men who naturally take the lead in making such rules are the elder members of our profession, whose position is established and who are beyond the necessity for competing—to whom, therefore, such rules are of comparatively little practical or personal importance. The observance of such rules, on the other hand, falls to those who compete, to those who have had no hand in the formation of the rules, and on whom, therefore, such rules sit very lightly. It is easy to see in such circumstances that laws may be made which will establish only one point, and that is the impotency of the law-makers.

Although the difficulty of the position is thus clearly apparent, I am glad to bear witness that the action of our central body is entirely in the right direction. The conference passed resolutions recommending the appointment of a professional assessor, whose award ought to govern the ultimate appointment of architect, unless insuperable objections should arise, and that the employment of the author of the best design should be considered an obligation of honour on the promoters.

THE WESTMINSTER PANORAMA.

IN York-street, Westminster, close to the St. James's Park Station of the District Railway, and the Royal Aquarium, a new panorama has been opened which, from the enterprise and skill shown by the proprietor and those who have assisted him, claims notice. The building in York-street, from the designs of Mr. R. W. Edis, F.S.A., has no architectural pretensions. There is a stone archway, relieved by Ionic pilasters at the sides, designed in a Renaissance style, and pronounced by a pedimental composition and some carving, which is the entrance to a spacious vestibule decorated in the same style with pilasters and a deep frieze of a pleasing tone of neutral green. Passing through this vestibule the visitor enters a corridor some 5ft. wide, lined with match boarding and painted of a dark chocolate colour, lighted by a few lamps with blue glass shades, the object of which is to prepare the vision for a full realisation of the scene presented. A rather sudden turn in this corridor, which is nearly dark in parts, leads to the foot of a spiral staircase constructed of teak, ascending to the circular platform from which the painting is viewed by the spectators. We may observe that the rotunda is a sixteen-sided polygon, and is nearly 130ft. in diameter, or about 5ft. larger in diameter than the old Colosseum in the Regent's Park, designed by Mr. Decimus Burton, but now pulled down. The platform is 30ft. diameter, which thus leaves between it and the painting, a distance of 50ft. all round, this annular space being occupied by the foreground of the picture. Every care appears to have been taken by Mr. Edis to render the building perfect for the illusive purpose in view, and we understand that gentleman, before planning it, examined many of the principal buildings of the kind on the Continent, so as to embody in the design the latest improvements. Of course the principal object in a panorama being to make the illusion to the eye as perfect as possible, and to make the picture and its illumination the all-important attraction, it would be not only unnecessary but injurious to make any display of the building. The whole structure comprises mainly the rotunda round which the picture is fixed, covered by a domical roof of iron ribs, zinc, and glass, a centre lantern, and a raised platform. The rotunda is built of brick, an iron stanchion being introduced at each angle formed by the sixteen sides. These stanchions are each 12in. by 9in., and were put up with ropes without scaffolding by eight Belgian workmen. The roof was constructed in the same simple, and in the most expeditious manner by these men. A tripod was erected in the centre, and by its means the plates were fixed, and the iron ribs of umbrella construction hoisted and secured without scaffolding. Lattice girders or principals of iron carry the main weight of roof. Below the roof, over the platform, but not extending to the picture, is a velarium of canvas to take off the glare of light and to throw it upon the picture all round. The construction of the platform and its surrounding area forms one mass of timber frame-work. The artificial foreground to the picture, occupying the space all round below the platform, is a rough-framed gallery of timber formed of raking bearers, supported by pillars, and planked to the different levels, contours, and slopes required to produce the optical delusion. It is some 10ft. high above the ground-level. This platform is covered by earth, and upon it is piled the heaps of earth and turf to represent mounds, and the natural contour of the battle-ground. Raised above this in the centre, the platform is also constructed of radiating timbers and boarded with teak. Nothing else was needed to complete the *deceptio visus* except to make the cylindrical picture lead the eye imperceptibly from the artificial ground to the horizon of the scene, and to produce the most effective means of lighting up the canvas.

Having said so much of the building, we may say a few words about the great picture itself, painted by M. Castellani, representing the "Campaign and Battle of Waterloo," which was previously exhibited in Brussels. The painter seems to have happily combined the realistic and tragic elements in his grand composition, which has been prepared after many years' study of the best available authorities. The country in which the memorable battle was fought has been depicted with consummate truthfulness, and exhibits a degree of technical skill and effectiveness which are essential to the illusory object in view. It needs a very close inspection to detect the transition between the artificial battleground strewed with warlike debris, and dead and wounded soldiers, and the work of the painter, the blending of colour and atmosphere has been so skilfully performed. The painting represents the positions of the French and allied armies under Napoleon, Wellington, and Blücher. Napoleon is seen on a knoll named Rossomme, with staff-officers a little to the right of the farmhouse of La Haye Sainte, while Wellington's position is distinctly visible in the horizon on a ridge of low hills, with a slope southward towards the French. The panorama takes in a very extensive field of view, and covers the entire ground of the battle. The great high road, with its rows of trees, from Charleroi to Brussels, intersects the scene, and passes close to the platform, cutting the view nearly due north and south. The positions and movements of the forces are clearly discerned through the haze and smoke of the battlefield. Marshal Ney, at the head of the skirmishers of the Guard, the English troops and artillery, the death of General Picton, and the French Guard, after the charge in the foreground, are incidents recorded with much force and dramatic power. The whole scene is admirably lighted; the cloudy and rather threatening sky through which and the dense smoke, the sun is endeavouring to pierce; the clouds of smoke here and there, and the painting of the atmosphere are rendered with masterly precision and effect, and one might imagine himself viewing the actual country, and a spectator of the thrilling battle. The uneven groundwork, the actual knolls and débris, the shattered trees, one falling across the foreground, the remnants of cannon, torn and shattered uniforms and firearms are arranged with skill, and well sustain the illusion. A less warlike subject would have been more instructive, and we hear the managers of the Westminster Panorama intend to make it a very entertaining and interesting exhibition; but those who can enjoy pictorial representations on an extensive scale will find the present scenery, and the manner it has been "put on the stage," highly creditable to the artists and the promoters.

REPORT OF THE METROPOLITAN BOARD OF WORKS.

YEAR by year, concurrently with the increase of the work of the Metropolitan Board of Works, the annual report is enlarged. That for the year ending on December 31st, 1880, has just been issued, and is a post octavo volume of 178 pages. The superintending architect states that during 1880, 191 plans for new streets were submitted, of which 119, representing a total length of about 33 miles, were sanctioned. Three plans of new theatres were submitted and approved, and nine applications for rooms to be used for dancing and music; of the latter, three were granted, three conditionally approved, and three refused. Under the Dangerous Structures Act, 3,061 complaints were received by the board, of which all but 200 proved on survey to be well founded. The number of structures requiring to be shored up or hoarded in, in consequence of their being in a very dangerous condition, had increased from 211 in 1879 to 354. The summary of district surveyors' returns for 1879, the last issued, shows that the new buildings numbered 10,710, and the additions and alterations 9,882, the gross fees received being £33,667 5s. 4d. Fees amounting to £1,883 17s. 3d. were remitted or lost, and office expenses were reported by district surveyors at £9,669 1s. 4d. Although attempts had been made to equalise the value of different districts, great inequalities still existed. The gross fees received during 1879 in 33 districts varied from £2 to £586, and in the remaining 32 districts they ranged from £607 to £3,669. The progress of metropolitan street improvements had been greatly delayed by a clause in the Act of 1877 by which the board was not empowered to take possession of more than fifteen houses occupied by the labouring class until they had provided sufficient accommodation elsewhere for the people to be displaced. The Home Secretary had declined to release the board from this obligation, and they have consequently introduced a clause in their Bill of the present session seeking relief. Owing to this cause, the Gray's Inn-road, Piccadilly to Bloomsbury, and Charing-cross to Tottenham Court-road, and the western portion of the Tooley-street improvements remain at a standstill, greatly to the injury of those owning or occupying premises on the proposed routes. The south side of Coventry-street had been cleared (a work since completed), the Deptford bridge approaches were being widened, and the Camberwell and Peckham improvements were in progress when the report was written. Some progress has been made in carrying out the schemes sanctioned by Parlia-

ment under the Artisans' and Labourers' Dwellings Improvement Act, although the board was severely hampered by the stipulations of the Acts. At the close of 1880, the position of matters under each scheme was: The building areas of the Whitechapel and Limehouse, the Bedfordbury, the Great Wild-street, the Old Pye-street, the Pear Tree-court, Clerkenwell, and the Whitecross-street schemes, have been let to the Peabody trustees, at 30 years' purchase of a rental of 3d. per square foot per annum, and on the first two of these areas new buildings were in course of erection by the trustees. The final award had been issued by the arbitrator in the schemes for High-street, Islington, St. George the Martyr, Goulston-street, Whitechapel, and Essex-road, Islington; negotiations were in progress in Bowman's-buildings, Marylebone, and Wells-street, Poplar, and schemes for Great Peter-street, Westminster, and Little Coram-street were being carried out by the Peabody trustees. No further measures will be undertaken by the board until some satisfactory amendment can be effected in the Artisans' Dwellings Acts. During the past year local improvements in various parts of the metropolis had been completed, the board paying one-half the expense, at a total cost of nearly £80,000, and others had been commenced or sanctioned which are estimated to cost a further £104,298. The parks and open spaces now under the control of the board comprise 1,676¾ acres, or rather more than 2½ square miles, and on their maintenance and improvements £11,686 5s. 2d. was expended, the heaviest items being at Finsbury-park, £3,370; the Embankment gardens, £1,720; Southwark-park, £1,575; and Hackney-commons, 1,040.

The fire brigade report shows that the system of providing movable stations, with a few men and light appliances, begun in 1879 at Ludgate-circus, had proved so useful that the system is being extended. Five stations were in use, and six more had been ordered. An important improvement was effected in 1880 by the establishment of six circuits of fire-alarms, with an aggregate of 40 call-points, which considerably reduced the distance to be run by persons giving alarms of fire, and led to earlier information being received at the fire-engine stations. Unfortunately, three-fourths of the alarms given were false, and thus a doubt was cast on all messages received in this manner. The return of fires shows a steady increase every year, the number for 1880 being the largest yet noted, 1871, but the proportion of serious to slight fires is 9 per cent., the lowest, with one exception, for fifteen years.

The Engineer mentions that during 1880 two new lines of relief sewer were commenced, one extending from Vauxhall-bridge to the high-level sewer at High-street, Clapham, the other being a branch from Vauxhall-bridge to a junction with the Effra sewer, near Kennington Church. These works, comprising a total length of 12,200ft., had been contracted for by Messrs. Williams, Son and Wallington, at £65,000, and are in progress. It is proposed to continue the series of relief sewers at once, with a line from Deptford-broadway to Lee-bridge, another from Rotherhithe New-road to Southwark-street, and new sewers at Camden-town, Kentish-town, and Holloway. The Wood-lane sewer, near Wormwood-scrubs, has been done under a contract taken by Messrs. Kellett and Bentley at £3,079 11s. During the past year contracts amounting to £4,551 were accepted for erecting engines and tanks in order to utilise the water obtained by the deep bore at Crossness pumping station, which has been carried to a depth of 1,064ft., and yields 40,000 gallons per day of good but hard water. Particulars are given of the proposals for rebuilding Battersea and Putney-bridges, and for repairing and altering several other metropolitan bridges, which have just received the sanction of the House of Commons. Reference is also made to the arbitration between the Board and the Thames Conservators as to the condition of the Thames, the result of which, it will be remembered, was that the allegations that shoals and banks were being formed near the outfalls of the main sewers, were reported not to be sustained. A table appended to the Engineer's report shows that during the year 31 miles 1,713ft. of local sewers, proposed by local boards and vestries, were approved by the Metropolitan Board, of which 119,374ft. run were for pipe-sewers, chiefly 12in. and 15in. diameter. An appendix to the report shows that the quinquennial valuation of the metropolis took place in 1880, and shows a total rateable annual value of £27,400,000, an increase of £4,300,000; the rate amounted to 6·32 in the £, the highest both absolutely and proportionately yet levied.

CERTIFICATED PLUMBERS IN NEW YORK.

THE bill for licensing plumbers, which has for some time been pending before the New York Legislature, is likely to become a law, and the American newspapers, both technical and secular, are discussing it with interest. The *Metal-Worker* denounces it as useless, and predicts that it will soon be observed only as a cloak for corrupt practices of various kinds. The bill requires that the names of all licensed plumbers shall be published once a year in the *City Record*, which the *Metal-Worker* regards simply as a printing "job"; while the provision that the Board of Health shall approve plans for plumbing before they can be executed it condemns on the ground that the members, even of the present Board, cannot be expected to judge of the merits or demerits of an intricate piece of work, and under a corrupt administration too much opportunity would be given for extorting money by the exercise of this discretion. The daily papers, on the contrary, hail the Bill as a means of deliverance from all sanitary ills, and denounce in unmeasured terms those who oppose its passage as enemies of their kind. "Probably," says the *American Architect*, "the most judicious attitude would be about midway between these two. While no legislation can do much to improve the workmanship of the careless and ignorant, there are some grosser faults which can be prevented, if the administration of the law is efficient and honest, and this is no small gain. Great as has been the outcry about the bad construction in New York, it is unquestionable that constructors as well as architects have a wholesome respect for the building law, and that for every case of criminally bad workmanship which is brought to light, a score are prevented by the inspector's warnings; and there seems to be no reason why a similar amelioration, in the average character of drainage work, should not be effected by analogous means."

ARCHITECTURAL ASSOCIATION.

THE fortnightly meeting of the Association was held on Friday evening, the President, Mr. Ernest C. Lee, in the chair. The following new members were elected: Messrs. A. Hemingway, G. Havill, F. P. Oakley, J. Butler Wilson, F. André Capper, J. Hingeston Buckeridge, W. R. A. G. Tucker, J. C. Hudson, W. Douglas Caräc, Mortimer Justin, R. M. Hamilton, Gerald C. Horsley, and W. T. Burr. Mr. F. E. Eales, hon. sec., proposed a vote of thanks to Mr. Horace Jones, City Architect, for allowing the members to inspect the works at the new central fruit and vegetable market. The final visit of the present session would be postponed on account of the Whitsuntide holidays from Saturday, June 4th, till the following week, the 11th, and an endeavour would be made to obtain permission to visit Greenwich Hospital, but particulars would be published in the professional journals. Mr. R. C. Page, senior hon. sec., read the "house-list" of officers for next session, and the name of the proposed president, Mr. Aston Webb, was received with loud applause. The President asked those who had promised subscriptions towards the Association Travelling Studentship to pay them in as soon as convenient, as the committee hoped to send out a student this summer. Mr. T. Graham Jackson, M.A., read a paper on "The Use of Marble and Similar Materials in English Architecture," which we shall give in an early issue. At its close a hearty vote of thanks was passed to the author, on the proposition of Messrs H. H. Stannus and S. F. Clarkson.

DR. WALDSTEIN ON GREEK SCULPTURE.

THE first of a course of six lectures on Greek sculpture was given at King's College, Somerset House, on Tuesday afternoon, by Dr. C. Waldstein. The lecturer stated that he did not propose so much to dwell on the artistic side of the subject as upon the intimate connection of Greek art with the actual life, thoughts, and feelings of the Greeks, and upon the successive changes which that art, as an expression of vital development, growth, and power, underwent in its several periods of birth, increase, perfection, and decline. A man could only be said to be fully known to us when we recognised his individuality in all of three ways—in what he said, what he did, and what he was like. In like manner, students would only grasp the broad results of their Classical studies as they regarded the people who were the subjects of investigation in the light of their words, events, and movements, or, in other terms, their philosophy, history, and archæology. All must be interwoven to produce a complete representation of the Greeks. Archæology could be studied from the descriptions of authors, from the fragments of monuments yet preserved, or from the actual remains identified by the descriptions—the only satisfactory mode. In this art of sculpture they could trace each stage of the struggle of the artistic spirit with the reluctant material, and his final victory over it. The artist dealt with an inorganic material, with the aim of representing living forms in such a manner as to cause the spectator to forget the illusion which he knew to be practised. In the first stage of this struggle the material obtruded itself on the spectator to the detriment of the illusion; in the second, an attempt was made to represent the physiological or actual forms of life; in the third, the effort aspired to manifest the physical life, the outward movement. In that lecture he must confine himself to the archaic period of the art, its childhood, which embraced all the period before Phidias, *c.* 400 B.C. It was very common to hear students dogmatically assert that because the early beginings of Greek art resembled the works of neighbouring nations that they derived all their skill from the Egyptians, the Syro-Phœnicians, or other Oriental sources. The progress of research had shown that very similar styles of rude geometric and waving ornament existed on the shores of the Baltic and in many far remote places, and while it was certain that the Greeks owed much to the influence of local surroundings, it appeared more scientific to affirm that the general similarity of archaic art was due not to intercommunication so much as to the likeness in the workings of the human mind, and was to be accounted for by the known fact that the drawings made by young children all over the world resembled each other although the work of cultured artists was easily classified. The lecturer showed enlarged drawings of heads of Athené, transcribed from early coins, and observed that these in their rude execution and clumsy conventional lines might be at first supposed to be akin to Egyptian sculpture, until we put a head from an Egyptian sarcophagus beside them, when a vital difference was apparent. The type, the minor details of form even, were alike; but the latter head, while more pleasing and reposeful, was the work of a self-satisfied man, the former busts expressed the strivings of a man after an ideal he felt he had not reached; imperfect, clumsy, ill-carved as they were, they showed germs of the art which was afterwards to blossom into the fullest beauty. Greek art, at its birth, was sunk almost as far below contemporary Oriental work as it afterwards towered above it. The earliest knowledge we possessed of this Greek art was derived from myths in which the constructors of the gigantic works at Argos, Tiryns, and Mycenæ, were magnified in the imagination of later writers into Cyclopians, and the originators of the arts of metal-working were personified as semi-deities. Dædalos seemed to have been a reformer in wood-carving, who introduced a more vivid mode of representing the human figure, and after-writers interpreted the traditions of his "living" statues to signify walking automata, instead of carved figures, imbued with a life that conquered the mere material. The poems of Homer represented another stage in our knowledge of archaic art. The period assigned for the actions described was cast back to a mythological period, but the descriptions of dress, armour, implements, were those of things contemporary with, and visible to, the writer, enlarged and transformed by his fancy to what he supposed to be becoming to the Homeric age. The lions of Mycenæ, the walls of Tiryns, even the golden and bronze plates on dwellings, had

been proved to have had, and still had, an actual existence; but the round shield of Achilles, with its five-fold plating and its sculptured scenes, was probably only visible to the mind of Homer. The next lecture will deal with the period of Phidias, and that and the two following ones will be given at King's College. The closing lectures will take place at the British Museum.

MIDDLE-CLASS HOUSE ARCHITECTURE.

A PAPER, reprinted from a contemporary, by Mr. Henry G. Brace, A.R.I.B.A., architect, under the above title, indicates a few important principles in house-planning, which may be read with advantage by those seeking to make our middle-class dwellings more convenient and economical. Mr. Brace's brief essay attempts to show how the useful may be made artistic without the expenditure generally lavished on mere ornament, and he illustrates his meaning by referring to a pair of semi-detached houses built from his designs, in Lordship-lane, S., with a small frontage. These villas consist of only two floors, without underground apartments—an arrangement which, no doubt, as the author observes, contributes much, not only to architectural effect in small houses, but to sanitary efficiency and economy of service. The piling up of stories on narrow front rooms is objectionable for obvious reasons, and underground living-rooms, common in London, and generally known as "breakfast-parlours," are certainly not the healthiest or driest apartments. Except in houses where two or three servants are kept, the second story of bedrooms is undesirable, as they are not within easy access of the mistress, and Mr. Brace interprets the commonsense of most people who live in such houses when he speaks of the daily economy of household labour resulting from a house on two floors. Few arrangements lead to such wear and tear as basement kitchens: the servants have to mount a flight of stairs at every call, and breakages and carpeting have to be added to the daily dusting and cleaning. By Mr. Brace's plan this inconvenience is obviated; the kitchen, with the scullery, larder, china-closet, and back entrance are conveniently placed in the rear projection, while the dining-room has a service-door close to the kitchen, larder, and china-closet. The author truly says: "It would hardly be an exaggeration to say that many a middle-class family which now keeps three servants in a house with three flights of stairs, might, in a house with only one flight to be traversed, do equally well with two."

The second feature claimed by Mr. Brace is a square hall, from which the three principal rooms—dining-room, drawing-room, and study—are entered, an important feature we have often insisted upon in the planning of compact residences. The staircase is placed in a recess on the outer side, which leaves a hall 10ft. square, and the stairs ascend from a few risers rounded at end, which project in the centre of hall. This arrangement is both economical and architectural; the staircase is not made an obtrusive feature from the entrance, and the recess affords the opportunity for effective treatment. But the author avoids also the ceiling and hole effect of most staircases, by making the hall open through the two floors, and exposing the sloping rafters at the side, thus giving an importance to this feature of the house it seldom has. The height of the hall, moreover, may be made conducive to light and ventilation, besides, as the author says, giving a free, spacious, look to the house. Fresh air can be admitted from the outside, and be warmed by a hot-water coil, and thus the hall forms a reservoir from which the principal rooms and bedrooms may be warmed. Mr. Brace admits the air through slanting slits in the door lintels. A third feature mentioned by the author is the grouping of the culinary and store accommodation near the serving door to the dining-room, now carried out in all good arrangements, though not seen so frequently in small villas as it ought to be. The plans and elevations of the semi-detached villas in Lordship-lane, which illustrate Mr. Brace's little pamphlet, show how far he has been successful in making the internal plan effective externally. The houses are of red brick, with tiled roofs, high-pitched, and each villa has a double gabled front, the entrance being slightly recessed between the main front and the side-projection, which is roofed under the slope of the main roof. Bay windows relieve the front. The architect has not been fettered by the details of Queen Anne or any other style, but has boldly endeavoured to produce a picturesqueness out of the simple elements at his disposal, and our inspection of houses built on this plan by the author leads us to think he has at least succeeded in showing how middle-class villas may be planned on sanitary and economical principles, and the *brochure*, giving the results of his experience, may be profitably consulted by the builder.

THE SCIENCE AND ART OF SANITARY PLUMBING.—II.

JOINTS AND PIPE-BENDING.

MR. S. STEVENS HELLYER delivered on Wednesday night, at the Society of Arts' Rooms, Adelphi, the second of a course of practical lectures on plumbing. On the walls were hung a large series of double-full-size working drawings and details, and many highly-finished specimens of wiped joints and bent pipes were shown on the platform and on a screen. The room was as before densely crowded, and great interest was manifested in the lecture, many pertinent, and one or two impertinent, questions being addressed to Mr. Hellyer, to elicit further information as to details. Joint-making had not yet, the lecturer observed, been performed by machinery with success, but remained a speciality of the skilled hand-worker. It might be called the Alpha and Omega of the plumber, the feature by which a good workman could be distinguished from the ill-taught and clumsy one. He proposed therefore that evening to go into the very rudiments of the operation for the benefit of the less initiated.

In preparing the ends of pipes to be connected by *wiped joints*, in a vertical or horizontal position, see, said the lecturer, that no "burr" is left on the edge of the inside pipe. While rasping off the outer edge of this pipe, a burr is formed on inner edge, and if this be not taken off with a shave-hook or pocket-knife, and smoothed, the roughness would catch any hair or other obstruction passing through a soil or waste-pipe. Well open the end of outer pipe to allow the inner one to enter about $\frac{1}{4}$ or $\frac{3}{8}$ of an inch, without contracting it in any way. Rasp off the outer edge of the outside pipe so as to get a greater thickness of solder upon the joint without increasing its external size. In "soiling" the ends of the pipes, soil over at the same time, or better still after the edges have been shaved, the inside of inner pipe, to prevent the solder running and adhering to the edge, brightened by rasping off the burr. To get a true ring round the pipe for the shaving-line, put the blade of a saw or a piece of planed wood against the end of the pipe; then take a pair of compasses (opened out to the width of the shaving required) and scribe a line round the pipe with the point of one of the legs, resting the other leg against the saw-blade as a guide. You will in this way get a truer shaving-line than if you scribed the line without the aid of the flat-surface board at the end of the pipe. In shaving the pipe, be careful not to dig the shave-hook down into the lead, especially at the outer edges, as it would weaken the pipe where there would be no thickness of solder to strengthen it again. All that is wanted is to take off the dulness of the lead for the solder to readily tin upon it. When joints are to be made to pipes already in position, the pipes should be tinned on the bench before they are put in their places, to prevent any foreign matter as brickdust, mortar, &c., getting between the solder and the pipes, and also to insure the end of each pipe being well tinned. In jointing, especially for soil, waste, or drain-pipes, the edge of inner-pipe should never be fixed against the current, for it would form a ledge for dirt or filth to accumulate upon. Now as to the solder. As it is generally bought ready for use, I need say nothing about the proportion of lead to tin. Solder for upright, branch and flange joints, and for sink and cistern wiping, wants to be a little finer than solder used for making underhand joints. When the solder is found to be too rich for making underhand joints, put a little soft jug lead into it, but do not put any pipe or cuttings into it, for such lead may not be pure. When the solder is just right for easy use, keep this solder-pot solely for making underhand joints to avoid any further bother. Then get another solder pot for general work, and as the tin wastes by constant heating, supply the solder pot for making underhand joints from the richer pot, feeding the latter from the new "casts" of solder. "Waste not, want not," would be a good motto to put round every solder-pot. Though the solder may not cost the user anything, it has cost money, and should not therefore be wasted by putting more solder on the joint than good work requires, or by not carefully picking up the splashed pieces, or by overheating. To "keep the pot always boiling" may be a good motto for cooks, but will not do for plumbers. In heating the solder over a coal or coke fire, keep a board over the pot to prevent the heat from flying off; but if the solder is being heated over a wood fire, put a large ladle over the top of the solder-pot with its mouth downwards, allowing it to sail over the top a little so as to catch the flame; turn it inwards to assist in heating the solder, but do not allow too fierce a flame to fall on the solder, or it will eat the tin away. "Time is money"; therefore, heat the solder as expeditiously as you can, and never overheat it, for by so doing you cause the solder to deteriorate. You ought to be able to tell the right test by taking out a ladleful and holding it near your face, or even by passing the back of your hand over it; a piece of wood is a very good indicator, for if a stick dipped into the solder smokes, the material is ready for use. In making an underhand joint, first pour the molten metal on the soiled parts of the pipe to get the pipes well warmed. Then pour a dribbling stream on the shaved parts of the pipes to be united, and well tin them by putting the solder round and round with the solder-cloth. Keep on pouring out the metal in one continuous stream round and round on the outer edges of the tinning, working at the same time the solder towards the centre of the joint, and bringing the solder from the bottom to the top. Manipulate in this way for a minute, and directly it is of one consistency wipe the joint, waxing the solder round and round to get the joint symmetrical. If you prefer to have an iron, see that it is well cleaned and just red-hot before using. Then, when you have a nice body on the proposed joint, rub the hot iron round and round it, and take it all off on the cloth, rub the hot iron on the solder, and work it up into a nice consistency upon the cloth, in the shape of a sausage roll; then quickly place the centre part of the solder against the underside of the pipes, and turn up the outer half on the off-side, bringing the hand back quickly to turn up the other half on the near side. This done, wipe the joint with all the dexterity you can command. This refers to underhand joints on small pipes. In making an underhand joint upon large pipes, there will be no difficulty in getting the solder to stay on the upper sides of the pipe; the difficulty will lie in getting it to adhere to the under sides, where it has a tendency to break off in lumps directly the pipes get hot. In making such a joint, keep moving the solder round and round the pipes, pouring the metal on the cloth as well as on the pipes to convey the solder to the underside of the joint in a molten state; this should be alternately done on both sides of the pipes during the process of making the joint, and the solder forming round the underside of the joint should be brought round on the upper side. When a good bulb of solder is formed on the pipes, the ladle should give place to the iron, and the joint should be wiped as quickly as possible. One secret of success in wiping such a joint is to keep the cloth following close to the iron. The outer edges, to make a nice, clean, joint, must be kept well heated with the iron. An *overcast* joint is made in the same way as a wiped joint; it is, in fact, a wiped joint overcast with the iron—*i.e.*, directly the joint is wiped, and while the solder on it is still hot, a hot iron is drawn up and down over its surface, forming it into a ribbed joint or giving it a number of facets. Overcasting a joint is time wasted, for although it may give additional strength, and prevent "weeping" if there be any great water pressure, a wiped joint is really all that is necessary. A wiped joint should call out greater skill from the plumber. Although the overcast joint was much used at the beginning of this century, it is never made in London now by good plumbers. In Scotland the joints are only made about half the length of English work. This effects a saving of solder, but causes an absence of beauty, while in funnel

pipes, a longer joint is stronger. An *upright* joint is one made on a vertical pipe or pipes. The ends of the pipes should be soiled and tinned upon the bend before the pipes are fixed in their places. The pipes are brought out 2in. or 3in. from the wall, or a small hole is cut round the sides and back of the pipe for the ladle and the hand to go round the pipes in making the joint. The edge of the outer pipe is well closed upon the inner one, to prevent the possibility of any solder running through the jointing to form a burr inside the pipes. In making a joint in such a position a good deal of solder will be wasted if means are not taken to catch the droppings, or falling pieces of solder. Plumbers often content themselves with placing pieces of board or slate round the pipe, or tie rags or a wisp of straw about it, and then, when the joint is made, they spend more time in picking up the solder than they did in making the joint. A proper solder-catcher can be very readily made, and applied to the pipe, and by its use not a particle of solder need be wasted. Cut circular collars, with a hole in centre to fit each, the size of pipe, and a slit through one side to pass the pipe through; they should be cut out of 5lb. 6lb. or 7lb. remnants of lead, and should be kept well soiled over, edges and all, to prevent the solder adhering to them. With a well-arranged set of collars, a man ought not to take more than a minute or two in selecting the right one, and fastening it on the pipe, about 2in. below the bottom edge of joint. To secure the collar in position, pull it tightly round the pipe, and turn the points one over the other, clipping it. Then sprinkle a little dust or sawdust from the floor to cover any opening between collar and pipe. An additional advantage of the arrangement is that the solder collecting in this disc keeps the pipes hot, thereby facilitating the making of the joint. To make an upright joint, unless the plumber is well skilled in pouring with the ladle upon his cloth, he wants a splashing stick to put the solder on the pipes. In making such a joint, splash the solder well upon the upper part of the jointing round and round, and keep pulling up the solder from time to time with the splashing-stick from the lower part of the jointing to the upper part, for the solder collecting in the dish will keep the lower part well heated. Splash on the solder rapidly, remembering that quickness is the soul of joint-wiping, and roughly form the joint with the splashing stick. Then take the iron in one hand and the solder cloth in the other, rub the iron over the solder, and put it into place with the cloth. Draw the hot iron right round the upper edge of the jointing at the back, following it closely with the cloth. Do the same at the bottom edge, and then change hands with the cloth and iron, and treat the front half in the same way, and the joint is made. While the iron is still hot, rest in two or three places upon the collected solder on the collar, pull away the melting solder into the ladle, and the rest of the collected solder will then come away in sections without waste or damage to pipe. When a man can make an underhand and an upright joint, he ought to have no difficulty in wiping a *branch joint;* but there are two things that the learner will do well to remember: (1) When the branch pipe is smaller than the main pipe the solder will rest readily upon the jointing, but when the pipes are of equal sizes the solder will have a tendency to fall off at the two opposite sides. In jointing such pipes, keep the catch-board close to the under side of the main pipe; for the falling solder will not only help to keep the pipe hot, but will also enable the plumber to dip his splashing-stick into it to supply the place of the falling solder from the sides. (2) As the lower part of the jointing will be kept well heated by the solder upon it, splash the solder well upon the upper part—*i.e.*, the branch pipe. In forming an opening in a lead soil or main waste-pipe to receive a branch-pipe, cut the hole in the main pipe about half the size of the branch-pipe, and then work up the sides with a bolt or hand dummy to form a socket upon the pipe, so that the branch-pipe may enter it about ⅛ of an inch, without coming into the bore of the main pipe to form any obstruction. The end of the branch-pipe should be tinned before the pipes are put together for wiping the joint. No branch-pipe should ever enter a main waste, soil, or drain-pipe at right angles. In lead-pipes, however slight the fall may be, the branch can always be "nosed" over a little at the jointing for the discharges. The old way of connecting branch pipes with the main ones by a *mitre* cannot be too severely condemned; it is possible its use arose because the mitred form of joint had been adopted in pump-making long before waste or soil-pipes were fixed. A mitred joint takes more time, more solder, and is more difficult to make than the branch joint just described. It is also wrong on principle, for the most careful plumber cannot leave the main pipe perfectly smooth, and the waste discharges from branches fixed on the upper part of this pipe would have to travel through this badly-fitted branch connection. The edges of branch or main pipe must form a collecting place for filth, and the solder, in making such a joint, would be more liable to work through the jointing to the inside of the pipe, than it would in the other form of branch connection. When soil-pipes are fixed in chases inside the house, there is no stronger way of fixing the pipes and connecting them together than by *block-joints*, which are easily wiped by a skilful plumber. In making a block joint, be very careful to round it off. Cut a circular piece of lead about 5in. larger in diameter than the diameter of the pipe; then cut a hole out of the centre of this "flange," a little larger than the outside diameter of the pipe. Soil over both sides and the edges of this flange; dry it over or by the fire, and shave the flange so as to get about 12in. of margin for soldering upon. Tin the shaved part of the flange, and put it over the end of the pipe, and "taft" over the pipe upon it in a round form so as to get a body of solder under as well as over the tafting. Never so taft over a pipe as to get a square edge next the pipe, for in so doing the pipe would not only be weakened by it, but you would not be able to get such a hold of solder upon it, and the joint will soon break. Open the pipe with a "turn-pin," to allow the end of the upper length to enter, without contracting it in the least, about ⅜in., and well tin the end of the upper length before putting the pipes together. See that the pipes are well fitted, to prevent the solder running through to the inside, and splash on the solder quickly, rub a well-cleaned hot iron round and round it, and wipe the joint dexterously. The flange should always be tinned before being put in its place. A *flange-joint* is made in a similar way to the block-joint just described. It is chiefly used on waste-pipes and small pipes where they pass through a floor. In fixing the pipe, working from the bottom upwards, the bottom end of the pipe is made to stand an inch or two above the level of the floor. A lead flange, as in the block-joint, is then put over the end of the pipe and a piece of board, about ¾in. thick, is placed on the flange for the blade of the saw to rest upon as a guide in cutting the pipe off to the requisite length for tafting. When the pipe is cut off, the board is removed and a turn-pin is driven down into the pipe, with one or two sharp strokes of the mallet, and the end of the pipe is then tafted back upon the flange. A *taft joint* is the simplest form of wiped joint. It is made by tafting back the end of the lower pipe for the solder to rest upon, and the joint is so simple to wipe that the poorest hand can make it. But the joint is very inferior in strength to the block or round joint, and where it is found it shows the want of skill in the plumber who made it. When a pipe is tafted back to get a sufficient base for wiping such a joint, the outer part of the taft becomes much reduced in substance, and by the time that it is shaved for the solder to adhere to it, there is little or no strength of lead left in the taft or base; consequently such a joint can never be very strong, and a look will suffice to show that it is not elegant. As to wiped joints generally, I may add that it costs no more for a skilful joint-maker to prepare a perfect joint than it does for an unskilful man to make an imperfect one. Nay, the latter is generally the costliest, for the excrescence of solder on it is wasted, its ugliness is offensive, and all unskilled labour consumes more time in execution than that which is skilled. *Copper-bit joints* are not in favour with London plumbers, but they are specially adapted for connecting small brass work, such as unions and nuts and linings, to lead pipes, as a copper-bit joint gives much more room for the nut to move up and down the lining than a wiped soldered joint, and, if well made, is also stronger for such connections. I would not, however, allow a copper-bit joint to be made on a soil-funnel of ventilating pipe, for though the union of the two pipes may be perfect, the jointing would not strengthen the pipes like a wiped soldered one. The copper bit would only bite a thin edge of piping, but the wiped soldered joint has a grip of about two inches on each pipe, and the body of strong soldering round such pipes keeps them in good rotundity. In soldering brass-work to lead, well tin the brass before making the joint. The plumber's mate should do all such tinnings at odd times. The "hatchet" form of copper bit is the best for plumbers' use. It should be kept well tinned and the soldering edges well feathered. The copper-bit *float* or *flow joint* is very easy to make. When the copper bit is well heated place one of the tinned edges against the tinned part of the brass-work, keeping the head of the bit as near the brass as practicable to assist in heating it; then push a strip of fine solder against the other tinned edge of the copper-bit, and the solder will flow round the pipe-base. When sufficient solder is formed on the top of the pipe, pull the copper bit slowly round the jointing, allowing the tinned feathered part of the bit to rest upon the pipe, and keeping the thin edge all the while against the brass-work. A *ribbon-joint* is also made with a copper bit and fine solder. This joint is more difficult to make, but is better than the flow-joint. A band of fine solder, about an inch wide and 3-16in. thick, is formed round the jointing; and so dexterously is it done by some plumbers that it is difficult to tell where the silver-coloured ring begins and ends, there being no mark of the copper-bit left upon the soldering. An *overcast ribbon joint* is simply a copper bit jointing, made as just described, and overcast with the copper bit, giving it small facets. When joint-makers fail in putting a true ribbon of solder round a connecting, they generally overcast it with a copper bit, to make good any unevenness, and if this be skilfully done, the work looks very neat, and is at the same time very strong. A *blowpipe joint*, when made, looks precisely like a copper-bit joint—the difference is in the mode of making. The one joint is made by the heat of a copper bit, the other by the heat of a flame, communicated by a blow-pipe. Though I condemned copper-bit jointing, I am in favour of a strong fine solder *astragal joint*. It has three times the strength of the other, while the astragals help to strengthen the work as well as adding ornament. Bacon noticed the neatness of such jointings, for he speaks of leaden pipes "bound with leaden bands."

I must now turn to the important subject of pipe-bending. The plumber cannot go far in fixing a pipe without coming to the necessity of bending it to suit localities, and upon the mode in which this is done will depend the wholesomeness or unwholesomeness of the pipe if it be used for soil or waste conveyance. With bad treatment and in unskilled hands, lead piping is very stubborn, and breaks rather than bends; but, in skilled hands it is very pliable, and turns in any direction. In olden times, and country plumbers still followed the rule, when plumbers wished to alter the course of a lead pipe, they used to cut and solder it, making an elbow joint on it. There are several objections to this plan. In making an elbow-joint, one pipe is made to enter the other at the mitre, so as to get an overlap and prevent the solder running through to the inside of pipe. Sometimes one pipe is left to stand up inside the other an ⅛in. or more, and the jointing is often made without consideration of the direction of the current through it. There is also the possibility of the solder running in through the connection or mitring, and forming spurs inside, and the appearance of this joint is not to be compared with a bent lead pipe. The bending of lead funnel-pipes, without cutting and soldering, commenced about 40 years ago; but for long afterwards only a very skilled plumber, here and there, succeeded in making a perfect bend. In bending the pipe, many so-called plumbers considerably reduce its strength, especially at the heel. As the strength and, therefore, safety of a stack of soil-pipes is only equal to its weakest part; when a 12lb. lead waste-pipe or an 8lb. lead soil-pipe is reduced, at the bends, to half its original strength, the whole length of pipe is depreciated accordingly. Unskilled plumbers also contract the tubing in the neck of the bend often to half the original

diameter. If a stack of 4in. pipe is reduced to 3in. at the bend, the whole of the stack might as usefully have been 3in., and the difference in cost saved to the householder. Yet all pipes might be bent so as to continue full-bore. In making an elbow-joint you have to cut a V shaped piece of lead, but in making a bend you need a similar V of tubing. The skilful plumber will provide for this, and knowing that he is working a pliable material, he will in bending the pipe dress the lead round from the neck where there is a surplus to the heel where there is a deficiency. In making a bend in any size of pipe above 3in., well heat the pipe by a flame from gas jet or from shavings put inside the pipe, or by pouring some hot metal or solder upon the part to be bent. The pipe should be heated as much as possible without melting. Then, if it is a long piping, stride over it, and press your hand (protected by a thick felt or cloth) upon the pipe where it is to be bent, and get your mate to pull up the end of the pipe, humouring the bending part as much as possible to keep it in circular form and prevent crippling. Lay the pipe down on one side, and with two or three sharp strokes of the dresser, dress the bulged part of the piping, from the side facing you, round towards the heel of the bend. Turn the pipe over on the other side, and dress the bulged part of the opposite side round to the heel. By this means you will thicken the lead where it had been weakened in bending it, and you will at the same time be giving room for the dummy to work inside the pipe. Take the dummy and put inside the pipe, and get your mate to knock up to the neck of the bend with the bulb of solder on the end of the dummy while you are dressing out the irregularities. Do not attempt too much at a time, for to make a good bend, and to make it quickly, several heats must be given. Some young plumbers ostentatiously overbend their pipes. No bend should be made at a greater angle than necessity demands. No bend is properly made in a lead pipe when the material is in any part reduced in strength. Some plumbers now use "bobbins" and "followers" for opening out pipes; but it is an unskilful method, quite unsuited to the material and certain to reduce its strength at the weaker parts. In making bends in small pipes, too small to admit the dummy, heat the pipe as hot as possible without bursting, and bend the pipe gently round, giving it as large a radius as circumstances will allow. Then lay the pipe down on its side, placing a thick piece of soft leather or felting, or two or three thicknesses of carpeting, under one of the bulged sides of the bend. Then, with your old cap or "felt" on the top side, to break the sharpness of the blows, dress the bulging sides back towards the foot of the bend. Turn the pipe over, and do the same with the other side. Bends can be made in strong lead pipes of small diameter in this way by skilled plumbers, without contracting the bore to any noticeable extent. In light lead pipes, it will be necessary to open out the pipe, contracted in the bending with an iron bolt. Service pipes should be carefully bent, to prevent the bore being reduced in any part, or the fitting will be robbed of its proper flush of water. In conclusion, the lecturer remarked that joint-making and pipe-bending, however important in themselves, were but the stepping-stones to sanitary knowledge, and announced that in addition to the medals offered by the National Health Society, he should present fifty copies of his book, "The Plumber and Sanitary Houses," with prizes in money, to such journeymen handworkers who should produce the best specimens of bent lead pipe, wiped soldered joints, and bossed-up lead breaks; and who shall in addition give rough sketches showing the best way of disconnecting soil-pipes and waste-pipes from drains, and of ventilating such pipes to prevent trap-siphonage. The lecture will be repeated this (Friday) evening, at the Society of Arts rooms, at 7.30 p.m.

TEAK TIMBER IN INDIA.

THERE has, according to Sir A. Phayre, been a considerable falling off in the export of teak timber within the last five years. In 1875-76, the value exported amounted to £432,389, and in 1879-80, to only £273,967. Teak timber exported is grown both in British territory and beyond it. The teak forests in British Burma are the property of Government, and are carefully conserved. No care appears to be taken of those in Independent Burma, or in Siam, and it is to be feared that the destruction now going on must in a few years render it impossible to find large-sized timber in those countries, in such positions as to be available for the market. In the districts of British Burma, which were annexed in 1826, similar waste was allowed. It was only in 1852, when experience had shown the absolute necessity of guarding against indiscriminate felling of trees, that the Marquis of Dalhousie issued orders for the formation of a forest department in the province. First under Dr. McClelland, and afterwards under the present Inspector-General of Forests in India, Dr. Brandis, successful measures were adopted for the conservancy of forests. This it was which led to the formation of a Forest Department for all India, which it is now acknowledged has been of vast benefit to the empire.

The growth of teak trees in British Burma is secured partly by planting in suitable localities, and by guarding against destructive agencies all young trees, whether planted or of natural growth. The principal destructive agencies are:—Fire, which in the dry season, unless prevented, frequently spreads over hundreds of square miles, and kills young trees; parasitical plants; and the method of clearing ground for cultivation on mountain slopes carried on by the hill tribes, who indiscriminately fell trees and burn them in one mass. The latter enemy to forest conservancy is, perhaps, the most difficult to deal with, as there is great danger of exciting the ill-will of the hill tribes by interference with what they have from time immemorial considered their right. Great caution thefore is necessary, and has been observed in carrying out measures necessary to check the destruction of trees by that means. Teak trees which have arrived at maturity, that is at the age of eighty to ninety years, are girdled two or three years before they are intended to be felled. The rise of the sap being thus intercepted, the trees die, and they become thoroughly seasoned while still standing. They are then capable of being floated down the streams and rivers without delay after having been felled. During the last five years there has been a material decrease in the yield of teak timber in the forests of British Burma. This will be seen from the following table of the actual quantity brought down during each year:—

	Tons.
1875-76	46,597
1876-77	46,431
1877-78	39,081
1878-79	22,763
1879-80	17,585

It must not be supposed that the diminution in the annual supply brought to market indicates a diminution in the actual number of mature, or full-sized teak trees existing in the forests. The reduction proceeds from various causes, and it may be confidently pronounced that the effect of the forest conservancy in British Burma has been to render available for public use a valuable natural product, while guarding against wasteful felling, which would, in a course of years, extinguish the supply for future generations. As regards the teak timber floated down the rivers into British Burma from the neighbouring countries, it will suffice to observe that the quantity is about four times that derived from forests in British territory. But, as already stated, as no conservancy is exercised in those countries, the supply, before many years, will probably be much reduced.

BOOKS RECEIVED.

A Practical Treatise on Mechanical Engineering, by Francis Campin, C.E. (London: Lockwood and Co.) is practically an abridgment of the author's larger work published some years since. All the matter has, however, been entirely re-written, and is quite up to date. With the sole exception that some of the chapters seem to have been abridged too much to allow the subjects treated being as intelligibly dealt with as might have been desirable, it is a sound and serviceable text-book.——*Lathe-work*, by P. N. Hasluck (London: Lockwood and Co.), is a passable manual of a most fascinating art, but not to be compared to similar treatises by Holtzapffel, Evans, Lukin, and others.——*Life of George Stephenson*, by Samuel Smiles, L.L.D. London: John Murray) is the centenary edition of a very interesting biography.——*The Illustrated Catalogue of the Paris Salon* (London: Hamilton, Adams, and Co.) is a very cheap four-shillings' worth. It contains about 380 fac-similes, after original drawings by the artists themselves, of subjects in this year's exhibition.——*The Gas and Water Companies Directory; Water Works Statistics*, 1881; *and Gas Works Statistics*, 1881—all edited and published by C. W. Hastings, London, are useful and handy works of reference.——*Mensuration made Easy; or the Decimal System for the Million*, by Charles Hoare (London: Effingham Wilson), is an attempt to bring home to the appreciation of the artisan and mechanic the merits of the decimal system—which, however, we fancy is not quite so near universal adoption as the author and other of its friends seem to fancy.——*A Life of the Rev. Rowland Hill*, by Edward Broome (London: Cassell, Peter, and Galpin) is the last volume of Cassell's monthly shilling library.

CHIPS.

Alterations are being carried out at Cromwell House, Beresford-street, Woolwich, to refit it for use as a boys' home, accommodating forty inmates. The contract has been taken by Mr. W. Tongue, of Plumstead.

A new organ, built at a cost of £850 by Messrs. Walker and Sons, was opened at St. James's Church, Camberwell, on Wednesday week.

During the excavations for drainage works now in progress at Caerleon, a paved roadway has been discovered some feet below the surface, the stones of which retained their original position. A well-shaped jar and Roman coins of the reign of Hadrian have also been found.

The new schools erected in connection with the Unitarian Church in Lodge-road, West Bromwich, were opened on Monday week, and the chapel, which has been renovated, was also re-opened. The schools have been erected at a cost of £600, by Mr. Fisher, of West Bromwich.

Under the patronage of the Queen, Prince and Princess Christian, and Prince Leopold, a Fine-Arts loan exhibition will be held at the Albert Institute, Windsor, in the month of July. It is intended that the exhibition shall comprise pictures (oil and water-colour), statuary, bronzes, tapestry, ivories, china, and other objects of interest.

The parish-church of All Saints, Wickham-market, East Suffolk, has been reopened after restoration and decoration. A new carved oak reredos, Decorated in style, has been erected; it contains four panels painted with figures of Apostles, prophets, martyrs, and the Church, three representatives in each panel. On the central mullion of the window above is a statue of our Lord. The new altar-table is of solid oak, and the new pulpit and reading-desk are also of carved oak. The walls have been decorated by Mr. Buckley, of the firm of Cox, Buckley and Co., of Southampton-street, Strand.

A new bridge which has been erected over the Ogwen River at Talybont, near Bangor, from the designs of Mr. Law, C.E., has been passed by the engineer as complete. The contractor was Mr. Owen Morris, Carnarvon. The present structure replaces one which fell soon after its erection, and is to form the subject of an action between the county and the contractor at the Chester summer assizes.

The foundation-stone of Selwyn College, Cambridge, was laid on Wednesday afternoon by the Earl of Powis, High Steward of the University.

Mr. Bonsor, a member of the Strand District Board of Works, has given notice of a motion to rescind the resolution passed last year refusing the offer of the Corporation to erect and maintain in perpetuity a refuge with two lamps on the west side of the Temple Bar Memorial, in unison with those on the east side of the structure. The motion will be proposed at the meeting of the Board to be held next Wednesday, and we hope rejected.

Ely Theological College was opened on Tuesday. Erected near to the Cathedral, it was founded by the present Bishop of Ely. The Lord Lieutenant of the county performed the ceremony of fixing the cross on the east gable of the chapel.

The City Lands Committee, which has been appointed for the purpose of inquiring into the expediency of removing the Mint from Tower Hill to a piece of land on the Embankment belonging to the Corporation of London, met last Friday. They appointed Mr. Shaw Lefevre, Chief Commissioner of Works, to be their chairman, and the Committee adjourned till June 13, when they will hear evidence. The investigation will, we hear, be of a very searching character.

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ILLUSTRATIONS.

A STUDY FOR A CHURCH.—CLOVERLEY HALL, SHROPSHIRE. —GLEN ANDRED, SUSSEX. — ST. MATTHEW'S CHURCH, BURNLEY.—HOUSE AT HARRINGTON-GARDENS.—DESIGNS FOR A CRICKET PAVILION.

OUR LITHOGRAPHIC ILLUSTRATIONS.

NATIONAL MEDAL DESIGN FOR A CHURCH.

THE study for a church, which we publish to-day, was exhibited last year at the Albert Hall Galleries, when a national bronze medal was awarded to its author, Mr. Arthur Marshall, of the Nottingham School of Art. The design is an attempt to adapt the Italian style to the plan of an English church, using such materials as are generally used in this country. The several internal divisions and departments are all emphasised externally, and the dome surmounts the crossing. The panels indicated on the south elevation over the aisle doors are in mosaic, the materials generally for the fabric itself being red brick and stone.

CLOVERLEY HALL, SHROPSHIRE, AND GLEN ANDRED, NEAR TUNBRIDGE WELLS, SUSSEX.

THESE two drawings came from the collection of the late Mr. Bruce J. Talbert. The first, or upper view, shows Cloverley Hall, Whitchurch, Shropshire, erected from the designs of Mr. W. Eden Nesfield, in 1862, for J. P. Heywood, Esq. It is built on a hill-side, and overlooks a lake in the most picturesque part of the county. The clever way in which the several levels of the house, necessitated by the slope of the site, have been managed by the designer, is remarked by Mr. Eastlake in his "History of the Gothic Revival," in which work this building is chosen as a notable example of Mr. Nesfield's skill. The main entrance is from a courtyard on the upper level. It consists of a spacious vestibule, panelled throughout in oak. Thence access is obtained under the music-gallery to the great hall, about 55ft. long and 28ft. high, the general plan of which, with its ample fireplace and large bay window, is not unlike that adopted in the old manor-house at Ockwells, in Berkshire. The walls are lined to a height of 17ft., with small oak-panels, the ceiling being trabeated and moulded in the same material. The bay window is of eight lights, divided horizontally by five transomes, and filled with stained glass, of an heraldic character, executed by Messrs. Heaton, Butler, and Bayne, who also painted the windows on the staircase. The fireplace is of stone, enriched with mouldings and crowned with a band of panels containing relievi representing nine of Æsop's fables carved by Forsyth. Above this, the oak-panelling, which reaches to the ceiling, is decorated with carved work, of a quaint and intricate pattern, somewhat of a Japanese character. From the great hall a short flight of steps, groined overhead, leads down to the lower hall, which serves as a garden entrance, and also communicates with the adjoining apartments. This hall is panelled with long amber-coloured tiles, and enriched with a frieze of the same material, representing birds, &c., painted on a white ground. A second flight of steps leads upwards from the great hall to the dining-room, drawing-room, and library. The ceilings of the latter rooms are executed in plaster, elaborately decorated in low relief. That over the dining-room is of a constructional type, revealing large beams and moulded joists, while a broad plaster frieze, representing harriers in full chase, is carried round the apartment. The fireplaces in these rooms—as indeed throughout the house—are richly carved and panelled. Of the exterior, our illustration will give a very fair general idea. The bricks are thinner than those ordinarily in use, and have thick mortar-joints like the old Tudor brickwork. The parapets, which are 3ft. high, are of wood covered with lead, which is beaten outwards at intervals in the form of large rose-shaped patterns, quaintly intersecting each other. Above this parapet, on the main front, rise lofty dormers, bearing in their gables sculptured representations of the seasons, carved by Forsyth from designs by Mr. A. Moore. The windows throughout the house are large and boldly treated with stone mullions and square heads.

ST. MATTHEW'S CHURCH, BURNLEY.

THIS church was consecrated a little more than a year ago. The north aisle, octagonal vestry, and tower over the western bay of chancel have still to be added. The cost has been about £8,000. Sittings are provided for over 500 worshippers. The nave is 80ft. long by 24ft. 6in. and the chancel 40ft. by 22in. The chancel is lined with chiselled stone. The screens and stalls are executed in Dantzic oak. The floors are covered with Godwin's tiles. The parapet and steps to chancel and sacrarium, are in marble and alabaster, and the pulpit is in iron and brass, with oak rail.

HARRINGTON GARDENS.

THIS interesting row of houses is from the designs of Messrs. Ernest George and Peto, architects, but we, unfortunately, have no further particulars.

"BUILDING NEWS" DESIGNING CLUB.—A CRICKET PAVILION.

A DESIGN for a building of this character forms a seasonable subject for illustration, and we are to-day enabled to publish the selected design submitted in our "Building News" Designing Club Competition, the author being "Jack."

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

BIRMINGHAM AND MIDLAND INSTITUTE.—The programme of the excursions of the Archæological Section of this Institute has been published. The first excursion took place on Wednesday last, and the places visited were Leicester, Bradgate Park, and Ashby-de-la-Zouch. On arriving at Leicester the visitors were received by local antiquarians, who showed them the various objects of interest in the town. On Saturday, June 25, there will be a half-day excursion to Kinver, Stourton Castle, and Prestwood; and on the last Saturday in July the members will visit Chaddesley Corbett, Harvington Hall, &c. The principal excursion of the year will be one extending over two days—August 5 and 6—the places visited being Cirencester, Malmesbury Abbey, Tetbury, and district. The last excursion will take place on September 3, when the members will proceed to Pooley Hall and Polesworth.

The foundation-stone of St. Nicholas Club, for working men, was laid at Brighton on Thursday, the 26th May. The building is of red brick, and on the ground-floor are mission and reading-rooms, and above it the club-room. Messrs. George Lynn and Sons are the builders, and the cost of erection will be about £800.

The new buildings of St. Clement Danes Schools in Stanhope-street, Clare-market, were opened on Friday week. They have been built from the designs and under the superintendence of Mr. C. W. Reeves, A.R.I.B.A., of Guilford-street, Russell-square, and accommodate 183 infants and 147 girls on the ground-floor, and 163 boys on the first-floor; the cost has been £3,400.

COMPETITIONS.

GLASS SELLERS' COMPANY.—The Court of the Worshipful Company of Glass Sellers have given notice that they are prepared to award a sum not exceeding £110 in prizes, for essays on the "Past and Present Position of the Glass Trade," as follows:—£50 for an essay on the "Glass Trade in all its Branches;" £20 for an essay on the "Trade in Crown, Sheet, Plate, Rolled, and Cathedral Glass;" £20 for an essay on "Flint and Pressed Glass;" and £20 for an essay on "Bottle Glass." Competitors will be expected to consider the present state of the trade, as compared with its condition in foreign countries. The Court, however, are not desirous of inducing the writers to prepare historical notices of the trade, and they would prefer that the writers should deal with historical matters only so far as they bear upon the present state of the British glass trade. The essays must be sent in not later than the 31st January next, to the honorary clerk, at the office, 58, Gracechurch-street, E.C., from whom further particulars can be obtained.

NEWTON HEATH, MANCHESTER.—The new church of St. Anne is about to be erected from the designs of Mr. A. W. Smith, of Manchester and Liverpool, whose plans were selected in a limited competition.

The foundation-stone of a new parish-room and church Sunday-school was laid at Beccles on Wednesday week. Mr. F. A. Woodroffe and H. Hopson are the contractors for the building, which will be of red brick, with black bands, will be Gothic in style, and will measure 50ft. by 20ft.

A new organ was opened in the parish-church of Bourton-in-the-Water on Sunday week. Mr. Alfred Monk, of Camden-town, London, was the builder.

The cemetery lodge at Chelmsford is about to be rebuilt in Kentish ragstone, from plans by Mr. F. Chancellor, of London and Chelmsford; the estimated cost is £400.

A new font has been dedicated at St. Stephen's Church, Cheltenham, as a memorial of the late Countess of Loudoun. Messrs. Middleton and Son were the architects.

The survey-committee of Worcester town council last week decided to recommend the council to increase the salary of the city surveyor from £400 to £600 per annum.

A new line of railway is being made to Barrow-in-Furness, by Bardsea and Conishead Priory. Mr. Stevenson is the engineer, and Mr. Gradwell the contractor.

A new organ, built by Messrs. Whiteley, of Chester, at a cost of £300, was opened on Thursday week at Northgate-street Congregational Church, Chester.

The 28 foundation-stones of new parish rooms and schools for St. Michael's, Lewes, were laid on Ascension Day. The stones, with the exception of the largest, form a string-course, and were laid by 27 ladies. The buildings will cost £500. Mr. Philip Currey is the architect, and Mr. Edward Pullinger the builder.

The Settle rural sanitary authority accepted on Tuesday week plans and estimates for works of water supply at Bentham, as prepared by Mr. Edwin Frith, of Bakewell. The estimated cost is £3,000.

At a special vestry meeting held at Rye, Sussex, on Tuesday week, plans prepared by Mr. G. E. Street, R.A., for the restoration of the parish-church in sections, were exhibited and formally adopted, subject to a faculty being obtained for the work.

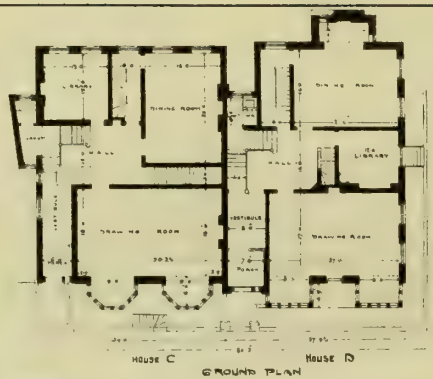
The important freehold building estate, known as Bagley's Market Garden, situate at Land's End (lately advertised in our columns) comprising a detached residence with grounds, outbuildings, cottages, and 38 acres, 31 poles of land, was sold by auction by Messrs. Philip D. Tuckett and Co., at the Mart, on Tuesday last, for £32,500.

The extension of the works of the North Essex Portland Cement Company, which has just been completed at Saffron Walden under the supervision of Mr. Welman, of Poole, was formally opened on Thursday, the 12th ult.

At the meeting of the Auckland Burial Board last Thursday, Mr. Pritchett, of Darlington, the author of the first premiated design for the new cemetery, attended, and received instructions to prepare the working drawings and specifications with a view to getting in tenders as soon as possible.

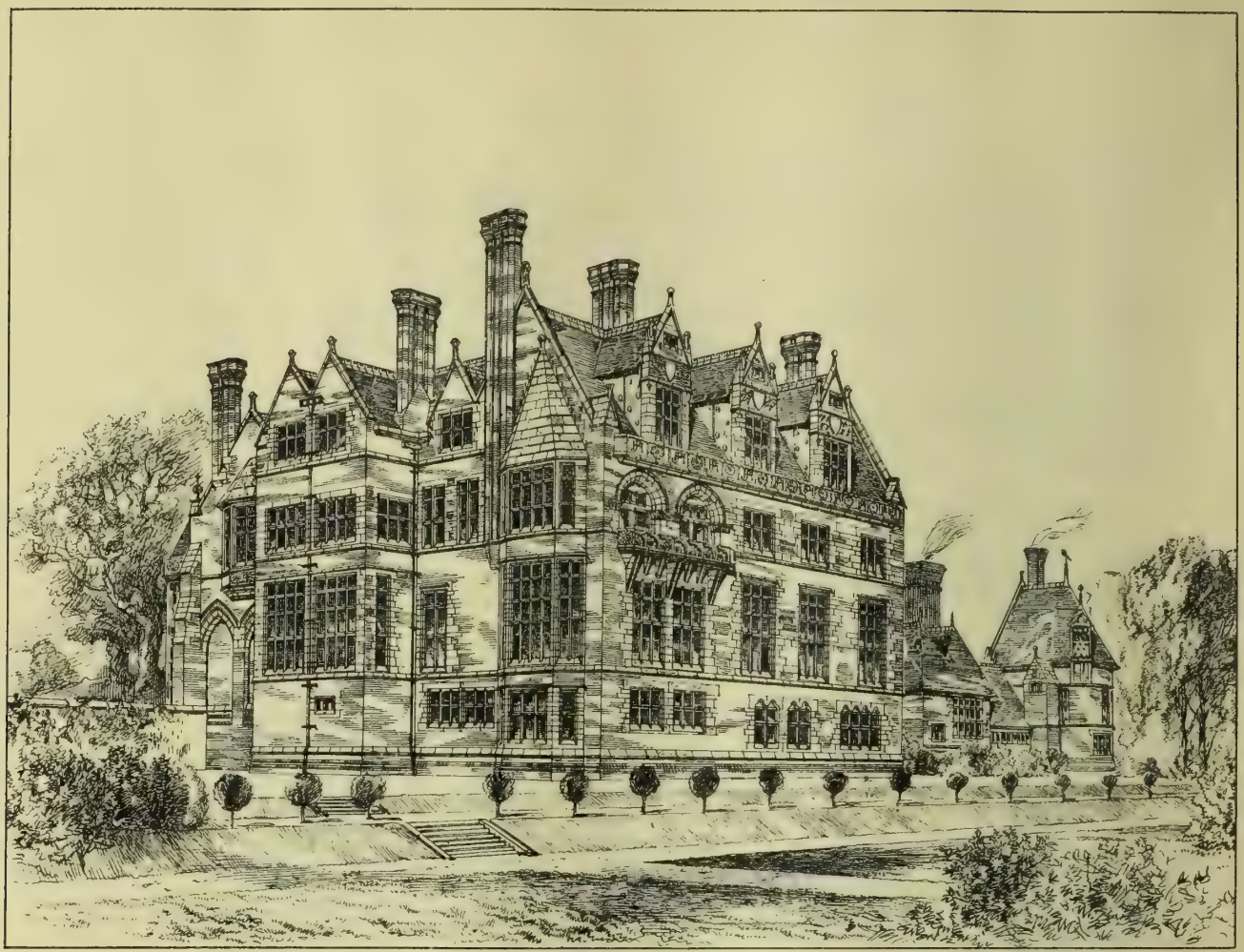
HARRINGTON GARDENS.

ERNEST GEORGE & PETO, Archts



GROUND PLAN

Photo Lithographed & Printed by James Akerman, 6, Queen Square, W C



GLOVERLEY HALL, SHROPSHIRE.

W Eden Nesfield Arch[t]

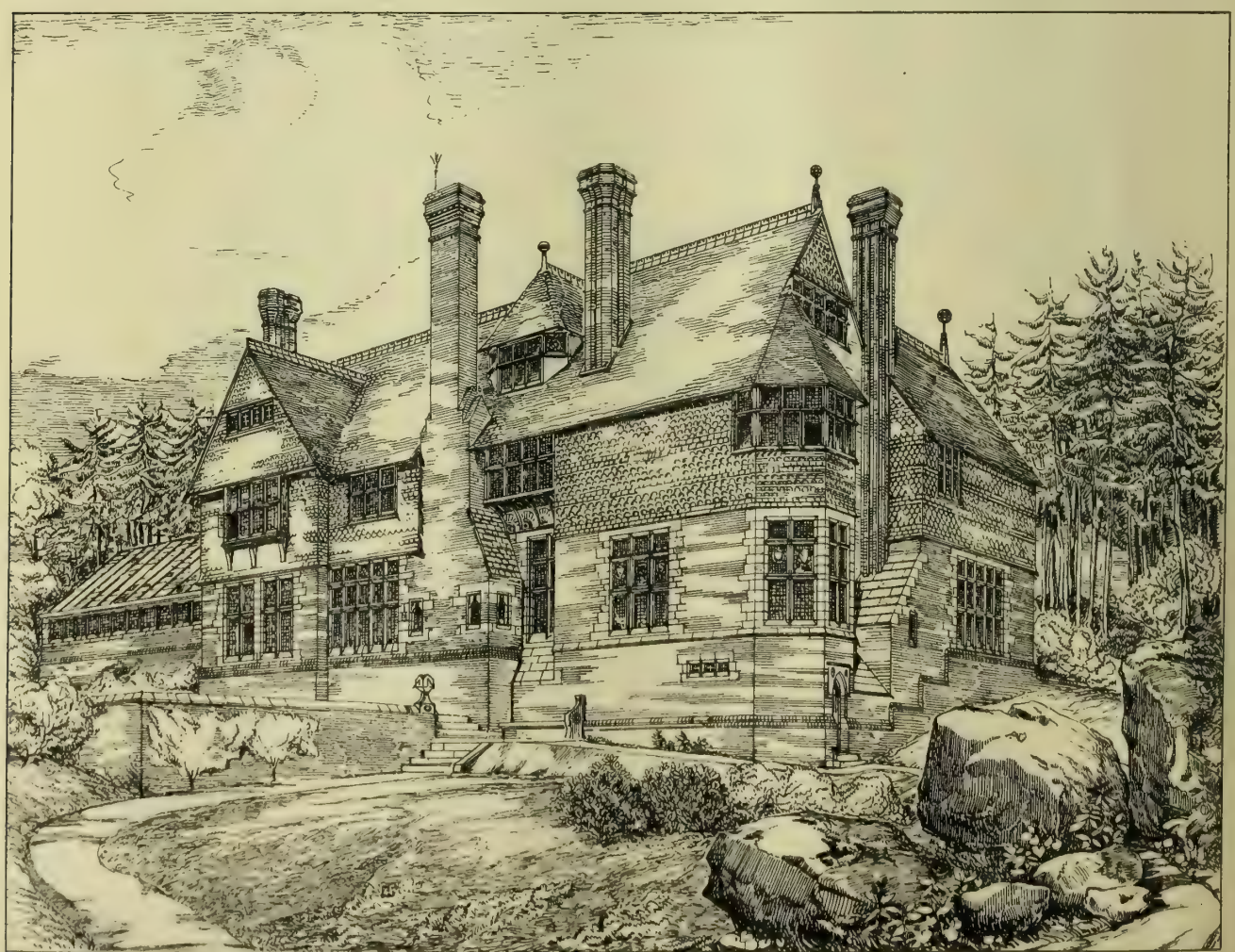
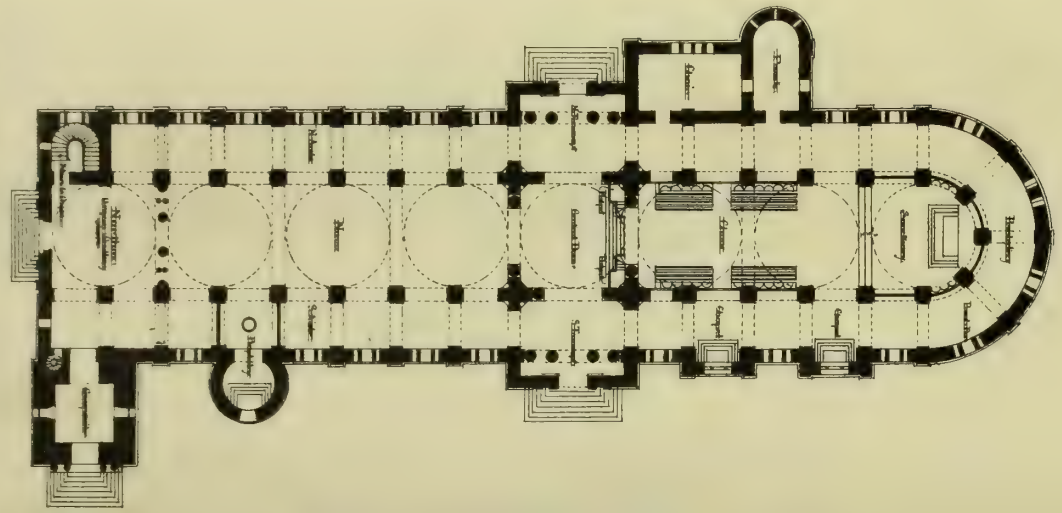
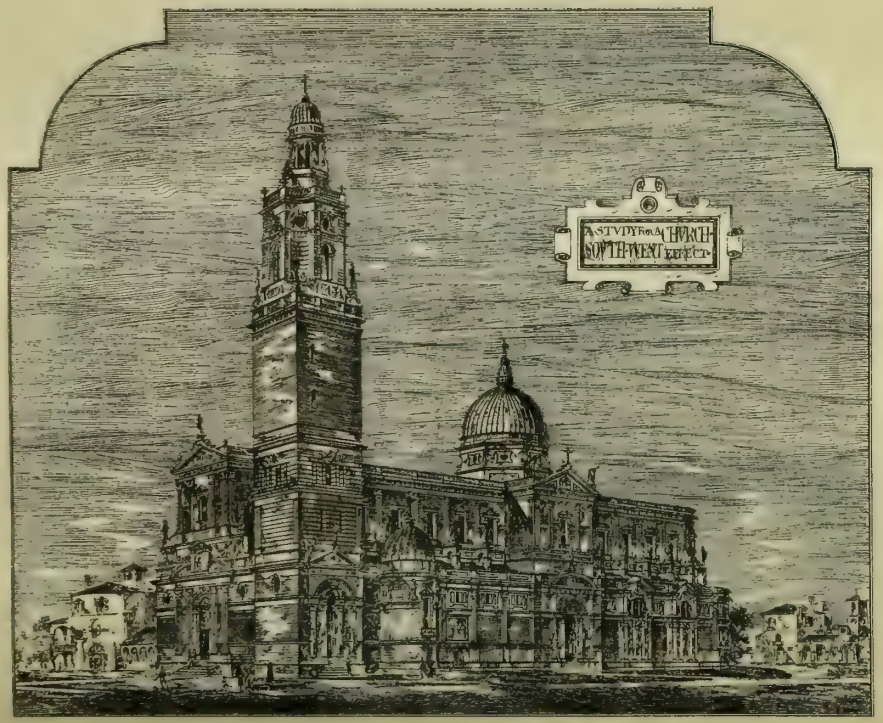


Photo-Lithographed & Printed by James Akerman, 6 Queen Square W C

"CLEN ANDRED", SUSSEX.

R Norman Shaw Arch[t]





A STUDY FOR A CHURCH
WEST ELEVATION AND PLAN

NATIONAL MEDAL AWARDED
TO ARTHUR MARSHALL NOTTINGHAM

A STUDY FOR A CHURCH
SOUTH ELEVATION

Decorative Panels above small doors
in Nave Mosaic

Photo Lithographed & Printed by James Akerman, 6 Queen Square, W.C.

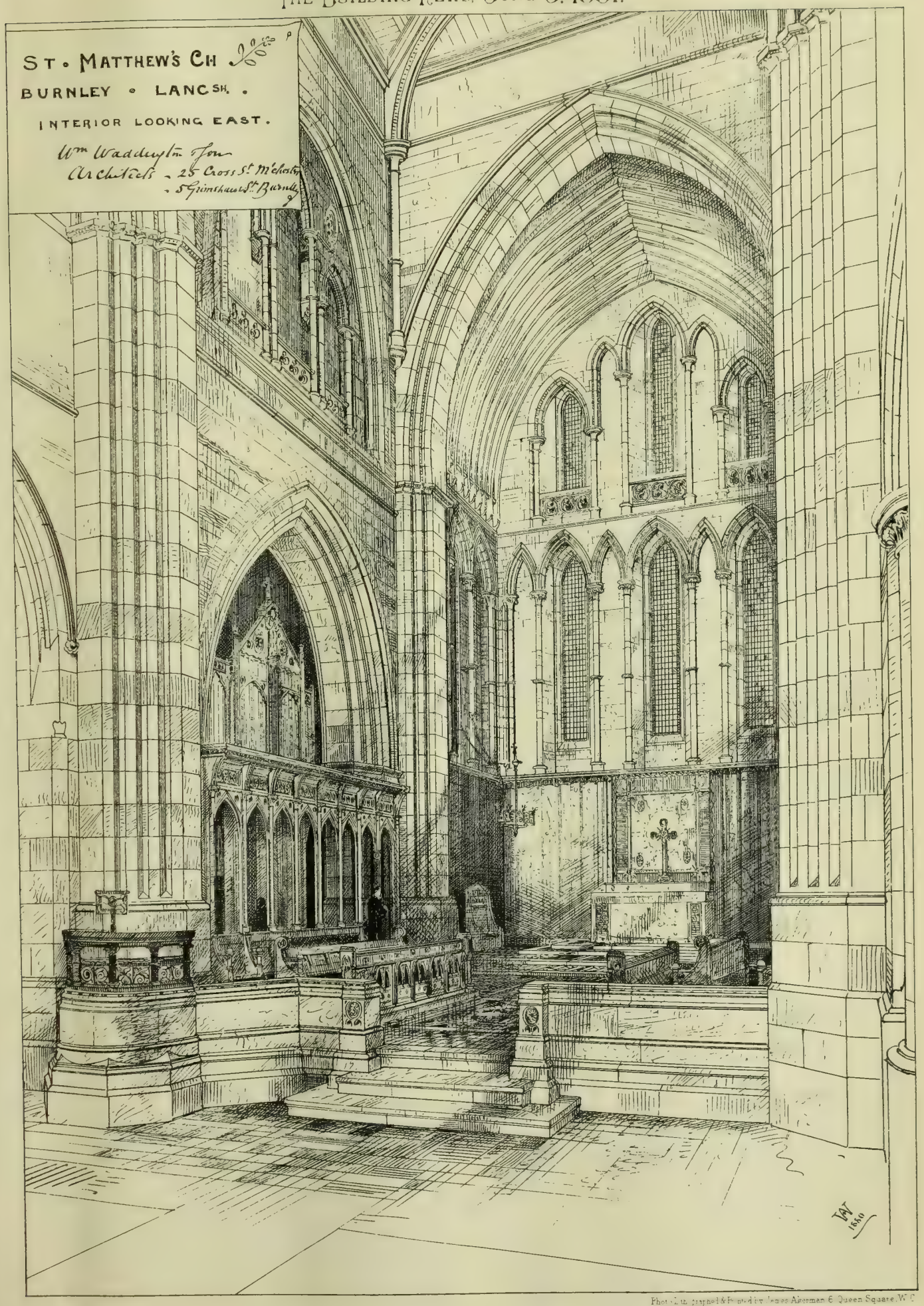
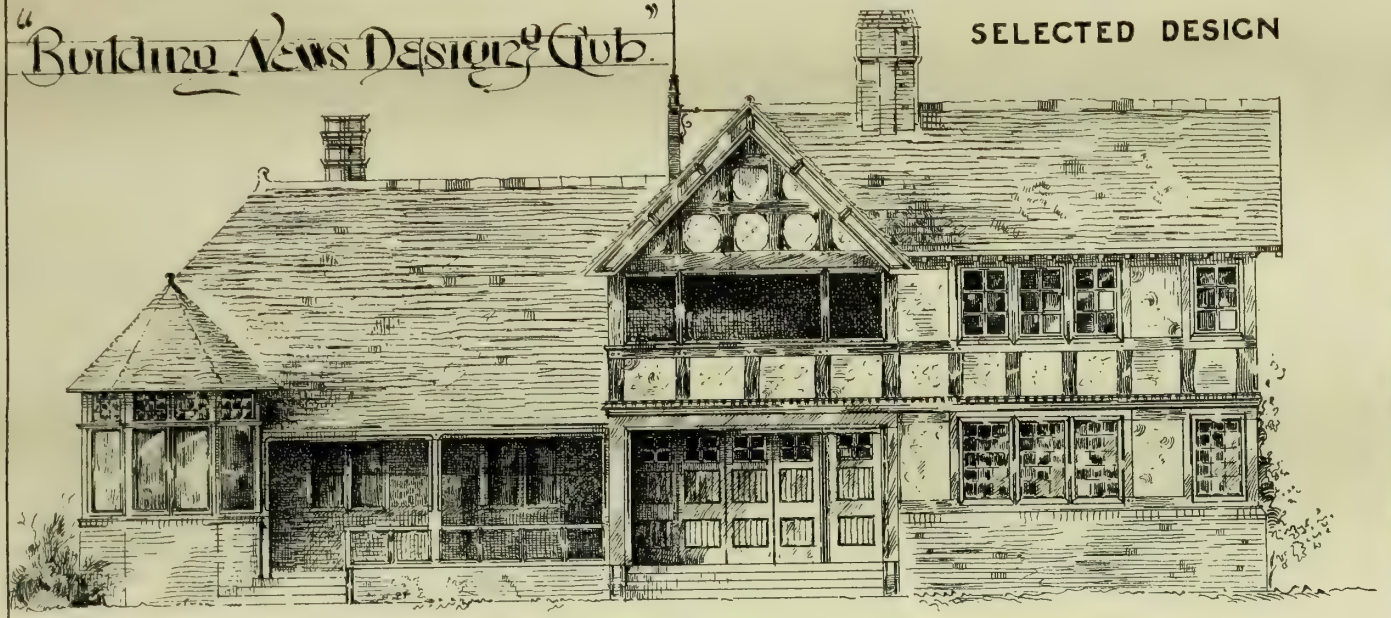


Photo-Lith. Stapleton & Pinder, by James Akerman, 6 Queen Square, W.C.

"Building News Designs" Club.

SELECTED DESIGN

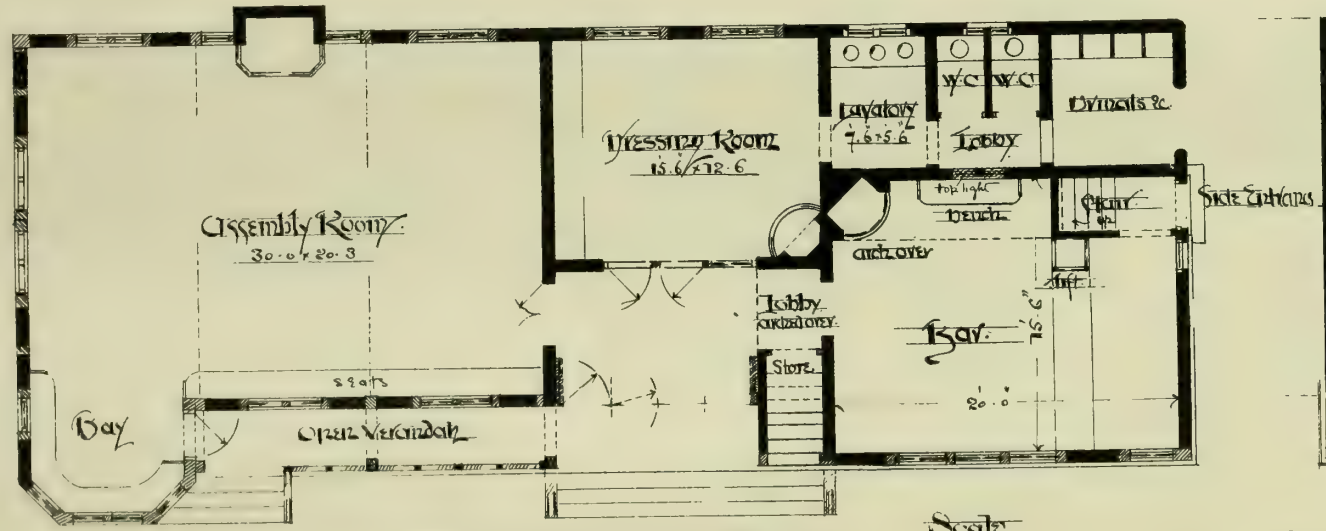
A Cricket Pavilion



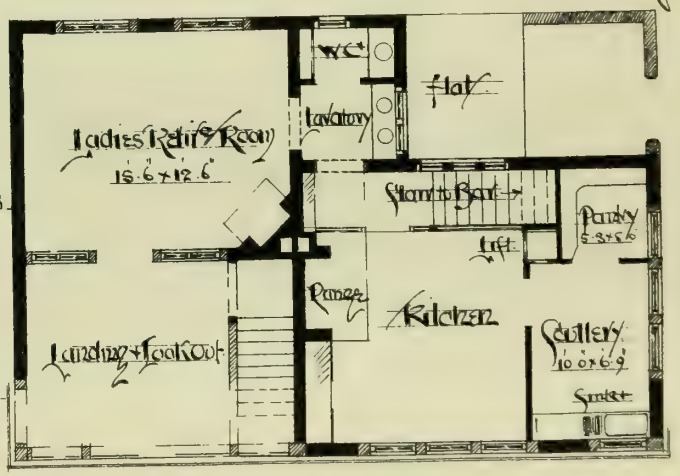
Front Elevation.

Sketch View

"Jack"



Ground floor Plan.



Scale 0 5 10 20 25 30 feet.

First floor Plan.

Photo Lithographed & Printed by James Akerman, 6, Queen Square W.C

Building Intelligence.

BITTERLEY.—The parish-church of Bitterley was reopened after restoration on Tuesday week. It was first built in all probability not later than in the latter half of the 13th century. It had become in a ruinous condition, but was repaired to some extent in 1850, when a transept was added. In 1874 the present rector added a chancel. On that occasion the architect was Mr. Haycock, of Shrewsbury, and the builder was Mr. Grosvenor, of Ludlow. Still much had to be done, and at length a Building Committee was formed. Mr. Nicholson, of Hereford, was appointed the architect, and Mr. Lewis, of Church Stretton, had the building contract at a cost of upwards of £1,300. During the work of restoration the north wall has been entirely re-built, the north aisle and large arch have been removed, and the floor lowered 2ft. in order to bring it to its original shape. The seats are now made open, as are also the windows in the bell-tower. The pulpit has been lowered, and an additional reading-desk provided. The square tower has been entirely rebuilt from the foundation, with a spire and roof covered with oak shingles. The Norman arch between the tower and nave has been restored. A new roof to the nave, and ceiled with pine, has been added. A large porch, in keeping with the other parts of the structure, has been also built.

DARWEN. — The foundation-stone of new schools for the parish of St. James was laid on Saturday, the 21st ultimo. The building will be in the Gothic style, and will have two lofty turrets on the main ridge, each finished with wrought-iron finial. Playgrounds are provided at each end of the building for boys and girls respectively, part of each playground being covered in for the use of scholars in inclement weather. The site measures 260ft. by 48ft., and the school will be built in the centre, and comprise mixed school, 60ft. by 42ft.; infants' room, 36ft. by 28ft. (with cellar under); two class-rooms, each 16ft. by 11ft., one 22ft. by 20ft. 6in., and another 22ft. by 14ft. 8in., besides cloak-rooms and porches. Cloak-rooms are placed in close proximity to both playgrounds and main entrances. The building throughout will be heated with hot-water apparatus fixed in cellar. The works are being carried out by local contractors from the plans, and under the supervision of Mr. W. Perry, architect, of Market-street, Darwen, and Lord-street Chambers, Southport.

DURHAM.—The church of St. Margaret, Crossgate, Durham, has been reopened after restoration. The fabric dates from early Norman times, the greater portion of the edifice having been built about the year 1100. An enlargement took place about 90 years afterwards, and also in the 15th century. Of the original Norman edifice, the nave and chancel still remain. The work now performed has been the rebuilding of the north aisle, which is twice its former width; also the erection of a new north porch, the replacing of the vestry by a larger and loftier one; the placing of a spacious organ chamber between the vestry and the north aisle, with a lobby to the vestry; new windows on the south side of the nave and chancels; and a five-light Perpendicular east window has replaced the modern Norman window of the old building. The altar, which is new, and of solid oak, stands against a stone retable, above which is an oak reredos of carved and panelled work. The contractor for the restoration works was Mr. George Bailes, builder, Durham, the architect being Mr. C. Hodgson Fowler, F.S.A., of Durham. The enlargements have provided 121 additional seats, and the cost of the work is about £3,000.—The Post Office Buildings Company (Limited), are, at present, erecting a large block of buildings in the rear of the New Post Office, Sadler-street, Durham, under the supervision of Mr. C. Hodgson Fowler, F.S.A., architect, of this city. The sole contract, which amounts to £2,800, has been let to Messrs. Geo. Gradon and Son, and the following are the sub-contractors:—Mr. W. Wardropper, mason; Mr. Jas. Laidler, plumber and iron-founder; Mr. Wm. Blakey, slater; Mr. Thos. Nesbitt, plasterer; and Mr. G. Smurthwaite, painter, and glazier. The premises consist of two blocks of warehouses, facing one another, with an open yard between; and across the end, connecting the two buildings, is a caretaker's cottage of four rooms, with yards and outbuildings. Underneath the whole of these buildings is a single large cellar, open from end to end, 201ft. in length, 18ft. in width, and 8ft. high, arched over at the top in brickwork, which is intended for the storage of wines, spirits, and other bonded goods. The upper floor of warehouses is approached by a staircase at the ends, with galleries round the outside, so that each ware-room may be let separately if required. The north block is now almost completed, and good progress is being made with that on the south side. The whole of the buildings are being erected from the designs of Mr. H. T. Gradon, architect, of Durham.

EAST GREENWICH.—The new Roman Catholic Church of St. Joseph, Pelton-road, was opened by Cardinal Manning on Wednesday week. The church is in the Decorated Gothic style, and consits of a nave 63ft. by 27ft., lighted by clerestories, and having north and south aisles, each 10ft. wide, terminating in eastern chapels; the chancel is 25ft. wide, and has an octagonal east end, it opens on north into a Lady chapel, and on south into St. Joseph's chapel. A triforium leads from chancel into a tribune for choir erected over the sacristies. The height of nave-roof from floor is 63ft., and that of aisles 20ft. The church seats 600 persons, and has cost up to present time £4,400, but pulpit, altar rail, stations, and a tower at north-west angle of site have not as yet been provided. Mr. Henry John Hansom, of Battersea, is the architect; Mr. W. Smith, Eldon-works, Kennington, the builder; and Mr. Cunnington the clerk of works.

FOUR ELMS.—On Monday the church of St. Paul, Four Elms, Kent, which is peculiarly rich in memorial windows, &c., was consecrated. The building, which is early 13th-century in style, consists of nave, transepts, and chancel. On the north side of the latter are the vestry and organ-chamber, and at the west end of the church is a semicircular recessed baptistery. The principal entrance is at the S.W., and is protected by an open timber porch, and there is another in the south transept. The walls are of Portland cement concrete, faced externally with Limpsfield stone, and internally with Bath stone, relieved by bands of Tonbridge sandstone. The dressings are of Box-ground stone. The open-timbered roof, which is of pitch-pine, all the rafters and timbers left in their natural state, and the boarding between being stained dark walnut, is covered with tiles, and is surmounted by an oak flèche containing the bell. The seats and fittings throughout are also stained walnut and varnished. The east end is square, and contains a window of five lancet lights, filled with a representation on the principal field of the "Ascension," under which are five groups—"The Agony," "Bearing the Cross," "The Crucifixion," "The Resurrection," and "Noli me tangere." The subjects occupy the entire area without canopies. The windows on either side of sanctuary contain our Lord as "The Bread of Life" and "The True Vine," and two other windows in chancel, "The Good Shepherd" and "The Light of the World." All these have fields of foliated ornament. The south transept or St. Paul window of three lights contains "The Stoning of Stephen," "Conversion of St. Paul," and "Preaching at Athens." These all have canopies. The baptistery contains seven lights—two "The Passage of the Red Sea," two "Noah entering the Ark," and the centre three "Christ Blessing Little Children." The floor of chancel is in rich tiles and mosaic, by Messrs. W. B. Simpson and Sons. The font, which is of Caen stone, was executed by Mr. Bradford, of Kennington. The pulpit is in character with the font, and was executed by the builders. The rails, &c., to pulpit-steps are of handsome hammered and polished brass, and together with the pendant and standard-lamps, brackets, &c., were executed by Messrs. Faraday and Sons, of Berners-street, W. The heating apparatus is by Messrs. J. L. Bacon and Co. The builders were Messrs. Punnett and Sons, of Tonbridge, and the whole of the work has been carried out from the designs and under the superintendence of Mr. Edwin T. Hall, A.R.I.B.A., of 57, Moorgate-street, London.

GATLEY-IN-ETCHELLS.—A new church of St. James the Apostle, at Gatley-in-Etchells, near Stockport, is now fast approaching completion, and is expected to be consecrated on St. James's Day. The structure, which is of Early Gothic design, from the drawings of Messrs. Medland and Henry Taylor, architects, of Manchester, consists of a nave, the western end of which, being narrowed, forms a kind of narthex or octagonal-shaped baptistery, and chancel, with organ-chamber and vestry on the south side. Provision has been made for 250 sittings, all of which are free and unappropriated; this number, however, will be materially increased by the proposed addition hereafter of a south aisle. Since the original plans were drawn the inhabitants have determined upon the addition of a tower to the building, which is now in the course of erection. The cost of the structure is between £2,000 and £3,000.

GLASGOW.—The new Franciscan Church, which has been in course of erection for a little over a year, was opened on Wednesday last, 1st June, in the presence of Cardinal Manning. This church has been designed and carried out under the immediate superintendence of Messrs. Pugin and Pugin, of Westminster. It is in the Early Decorated style, but very severe in treatment, and quite in harmony with the austere rules of the Franciscan Order. Mr. John Devlin, of Glasgow, was the contractor, and Brother Patrick, a member of the order, has acted in a most efficient manner as Clerk of Works.

HEREFORD.—New works for Messrs. Davies and Co., soda-water makers, have been erected at Hereford. The buildings cover nearly half-an-acre of ground, forming three sides of a square. The warehouse and stables are on either side of the square, and the soda-water factory is built in the centre. The factory, including the office, measures 100ft. in length, 20ft. in width, and is lofty in proportion; and, in addition to the ordinary one, there is a supplemental roof of varnished wood, whose purpose it is to prevent any impure matter falling into the waters. The machinery is by Hayward, Tyler, and Co., of London. The construction of the new buildings, as well as the re-construction of those lately occupied by Messrs. Davis and Co., was intrusted to Mr. W. W. Robinson, architect, Hereford, the whole of the work being carried out from his designs and under his supervision.

HOLBECK UNION.—Some time since the Local Government Board approved of plans for a new infirmary and two new wings to be added to the main building which forms the old workhouse. The old infirmary will be pulled down, and the new infirmary will stand on that side of the workhouse having its principal frontage to Beeston-road. It will be over 300ft. long and 20ft. wide internally, two stories high, and will be lighted by about 60 windows on each side. The material used in its construction will be chiefly pressed brick, with stone dressings. An architectural feature will be a series of towers carried above the ordinary level of the roof on the Beeston-road elevation of the building; but with that exception there will be very little outlay upon ornamentation. There will be accommodation provided for about 100 patients. The two new wings will be placed one at each end of the existing workhouse, the frontage of which will be much improved by the addition. The plans have been prepared by, and the buildings will be erected under the superintendence of, Mr. William Hill, Park-square, architect to the board; Mr. William Iredale being clerk of works. The estimated cost of the buildings is about £9,000, and it is expected that they will be completed by April next. The foundation-stone of the main buildings was laid last week.

HULL.—The foundation-stone of the new Church of St. Philip's, Hull, was laid on Monday. The church will be placed with its axis north and south (instead of east and west, as usual). The plan shows a nave of 66ft. long, by 27ft. 6in. wide; a west aisle 16ft. 6in. wide, and a chancel 31ft. long by 23ft. 3in. wide. The church will be of lofty proportions, the ridge of the nave-roof being 58ft. and that of the chancel 50ft. above the floor. The building will be faced externally with red stock bricks, with stone dressings, and roofed with green slates. The interior will be plastered, but the arches and string-courses will be of red brick. Accommodation will be provided for 450 per-

sons. The architects are Messrs. Botterill, Son, and Bilson, of 23, Parliament-street, Hull, and the whole of the works are being executed by Mr. R. Sargeant, of Wright-street, Hull, at a cost of £3,488.

LIVERPOOL. — A new Union Presbyterian Church was opened at Liverpool Presbytery on Wednesday. The building, the plans of which have been prepared by Mr. David Walker, architect, of this city, consists of a wide nave divided by iron columns into aisles, the total internal dimensions being 75 feet in length by 58 feet in width. On the north-west front a tower, with a saddle-back roof, and open lucerne lights at the bell-stage, rises to a height of 90 feet, and on the south side an octagonal-ended staircase flanks the main gable, which is filled with two large three-light windows. The nave will seat 700 and the gallery 204 worshippers, with provision for extension, if required, by the erection of side gallaries for an additional 200 sittings. Three large class-rooms, vestries, and staircases are at the rear of the church, and spacious entrance porches are provided on the south front, with heating apparatus and other conveniences in the basement. A large lecture-hall, with retiring-rooms attached, capable of holding 500 people, has been erected over the ground-floor class-rooms in the rear, the roof being open to the ridge. The style of the building is Early Geometric Gothic, and the material used in the structure is almost entirely brick, from New Ferry Brickworks, with moulded bricks for all the doors, windows, and other features. The work has been completed, at a cost of about £4,300, by Mr. Wallace, Mr. Carver acting as clerk of the works.

MOUNT STUART, ROTHSAY.—Considerable progress is being made in the rebuilding of Mount Stuart, the principal residence of the Marquis of Bute, which, with the exception of small portions of the wings, was destroyed by fire a few years since. The new mansion is being erected on the old foundations, and will be Gothic in style. It will be five stories in height, including attics, and measures 260ft. in length from end of conservatory to end of chapel, and 130ft. in extreme breadth. On the ground floor are the grand hall, great drawing-room, small drawing-room, libraries, central hall, dining-room, and conservatory. The central hall is 130ft. by 60ft., the great drawing-room 60ft. by 23ft., and dining-room 46ft. by 23ft., in the principal apartments the height from floor to floor is 21ft. 6in., while the grand staircase is 34ft. square. The first floor is devoted to Lord and Lady Bute's rooms and family bedrooms, while in the basement and upper floors is the servants' accommodation. The stone used for the whole of the exterior and part of the interior is red sandstone from the Corsehill quarries, Annan, and for the backing up of inside walls a stone quarried on the estate is used. In the grand hall the columns and bases are of marble, with alabaster arches. The estimated cost of the entire house will be not less than £200,000. Mr. R. Rowland Anderson, of the firm of Anderson and Browne, Edinburgh, is the architect, and the the sole contractors are Messrs. Watt and Wilson, of Glasgow. They began building operations a year ago, and since that time have employed over 300 men at Mount Stuart. At the present time the foundations are all laid, and the basement and principal floors (5ft. in thickness) have, so far as mason's work is concerned, been completed, and a beginning is made with the first floor. The work will not be finished for three more years.

PLYMOUTH.—New board-schools in Palace-court were opened by the Mayor of Plymouth on Tuesday. They are specially planned for the adoption of the dual desk of Messrs. Colman and Glendenning, Norwich, and are the first set of schools of this kind in the Western Counties. The schools are in three departments, each consisting of a principal schoolroom and four class-rooms; accommodation is provided on ground-floor for 288 girls and 257 infants, and on the first floor for 247 boys. The sizes of the chief rooms are: girls' room, 68ft. by 22ft.; boys', 49ft. 6in. by 22ft. 6in.; infants', 30ft. by 28ft. The class-rooms range in size from 22ft. by 20ft., to 16ft. square. Mr. H. J. Small was the architect, and Messrs. Lapthorne and Good are the contractors. The total cost has been £8,027, equal to £7 18s. per head, of which £2 13s. is due to purchase of site, which covered 12,000 square feet, and cost 4s. 2d. per foot.

ROCHDALE.—A new club-house is in course of erection at Smallbridge, near Rochdale, for the Egerton Club. The building was commenced a week ago; the sole contractor is Mr. T. Crabtree, Rochdale. The materials used are pressed red bricks, with Yorkshire stone dressings. The street at back is 11ft. lower than that at front, therefore, a good basement story is obtained. In the basement is a keeper's house, a kitchen, and cellarage for wine and beer; a hoist runs from basement up through bar to assembly-room. The several rooms are heated by hot-water, the boiler being in the cellar. The interior wood work is of pitch-pine varnished. The cost, without furnishing, will be £1,500. The work is being carried out under the superintendence of the architect, Mr. James Cheetham, of Rochdale, and a Late Gothic style has been chosen for the elevations.

ST. EWE.—The parish-church at St. Ewe, near Mevagissy, contains, it is believed, the finest and most interesting old rood-screen in Cornwall. It is made wholly of oak, exquisitely carved, groined upon its eastern as well as its western side, and has a wide rood-loft on its top. Between 40 and 50 years ago it was in part renovated by the late Mr. Gendall, of the Cathedral Yard, Exeter. The church itself is being carefully restored from the designs of Mr. James Piers St. Aubyn. Advantage of this has been taken to care for the old screen. Under the direction of the architect it is now being restored and lengthened. The task of restoring it has been entrusted to Mr. Harry Hems, of Exeter. St Ewe Church is one of the few old churches in the west country which can boast of a spire.

WEDMORE.—On Wednesday the church of St. Mary, Wedmore, which has undergone complete restoration, was reopened. The exterior of the edifice was formerly covered with rough-cast, and the proportions of the interior were marred by the presence of pews, together with a heavy gallery. These have been done away with. The church, which is a fine specimen of Early Perpendicular work, consists of a central tower, chancel, nave, aisles, transepts, and chantries north and south, and also a Lady chapel, which is an addition of a later date. The whole has been renovated both inside and outside, and during the progress of the work several interesting discoveries were made. In the porch two windows and a doorway have been opened up, having previously been blocked up with old tracery. A very interesting fresco painting was discovered when the framing supporting the sounding-board of the pulpit was removed, representing St. Christopher carrying the child Christ across the river. This has been completely and effectually restored. Mr. E. B. Ferry, of Spring-gardens, was the architect; and Messrs. Merrick and Son, of Glastonbury, were the builders employed. The total cost of the work was between £2,000 and £3,000.

CHIPS.

Advertisers and others who do business through those old and well-known agents, Messrs. Bates, Hendy and Co., may be glad to be reminded that they have just removed to 37, Walbrook, E.C.

Mr. Pritchett, of Darlington, has been appointed surveyor to the Duke of Cleveland's building estate, the late surveyor having left the town.

On Thursday, May 26, the new organ erected at Whitefield's Tabernacle, Tottenham Court-road, was opened. The cost of the organ is nearly £600, and it was built by Messrs. Bishop and Son, from the designs of Mr. Alfred Burr, architect, under whose superintendence the late improvements to the building have been made. A new oak platform, pulpit, and organ-gallery now form a prominent feature in the old Tabernacle.

An exhibition of modern etchings is on view at the West George-street galleries, Glasgow. Amongst the artists represented are examples by Herkomer, J. C. Hook, Seymour Haden, Samuel Palmer, L'Hermitte, Rajon, Millet, Gaillard, and Gravesande; Mr. Whistler is also amongst those exhibiting, his works being dismissed by the *Glasgow News* as "spectral abortions" and "the only blots" in the exhibition.

The judging at the art and industrial exhibition now being held in St. Andrew's Hall, Plymouth, took place on Saturday afternoon, and after the art pottery awards had been made, the Rev. J. B. Hughes, of Staverton, delivered a lecture on "Pottery." The exhibition has thus far been a great success.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

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RECEIVED.—J. and E. G.—J. C. and Co.—J. W.—W. T. B.—F. A.—B. and B.—G. H. E.—C. T.—M. and Co.—B. and Co.—F. W. R. and Co.

R. J. (Why not, if the client is willing?)—B. (Yes, to be published by Batsford almost immediately.)—J. G. (Please send.)—R. D. W. (All drawings are returned.

"BUILDING NEWS" DESIGNING CLUB.

DRAWINGS RECEIVED.—Domus, Walter H. Hubert.

Correspondence.

SANITARY PLUMBING AND PLUMBER'S WORK.—"WHAT IS A PLUMBER?"

To the Editor of the BUILDING NEWS.

SIR,—It is with great regret that I read Mr. Davies' letter in your last issue, and from the tone of it I feel convinced that he is one of those so-called friends who flatter, when a little plain speaking on their part would prove true friendship, even, if by so doing, they cause a pang of pain.

He also does not appear to know his own mind, for in one week he publishes two distinct doctrines; one is, that "as to sanitation we plumbers, unless we like, have nothing at all to do with it"; and in one of your contemporaries complains "he was astonished to hear Mr. Hellyer express an opinion that no man should be allowed to carry out sanitary plumbing without being certificated." He also goes on and tries to prove that certificates are valueless "because the examinations are simply a series of theoretical questions that may be learned from a book." Now, if book-learning is of so little value, why does Mr. Davies take the trouble to write and try to teach others by that means? and then does not follow his own advice, but gives his own ideas and ways of doing work instead

of "our forefathers." What a strange assertion to make, "that, in the majority of cases, non-practical men are unworthy of a certificate." Quite right so far; but don't throw obstacles in the way to keep them from learning how to make themselves worthy if they should feel so disposed, and is it some heinous crime that "those who are worthy of it will not work by the hour"? Does he want to compel every man to keep his nose to the grindstone all his life if he can raise himself to a superior position by making use of the faculties God has given him? Would he work for tenpence per hour if he could get a guinea a day? Mr. Davies must be a confirmed joker; he cannot be in earnest.

"Who are the examiners?" If Mr. Davies can write shorthand, Pitman's system, he lays himself open to the thought that he cannot read it afterwards, or else he would have found these words of Mr. Ernest Turner's: "The examinations should be conducted by a committee of practical plumbers." If he did not take notes himself, he will find the words printed in more papers than one which reported the proceedings; so he has no excuse for that interrogation.

I quite agree with Mr. Davies that "a plumber, who calls or styles himself a sanitary engineer, is all nonsense." I believe in calling things by their right names, and a sanitary plumber a sanitary plumber, and not arrogate another title because it has a higher sound, though of no more importance. And another reason is, I feel prouder of my simple unassuming title than I should of the other, which is taken up now by so many of the X Y Z sort. There are a number of gentlemen (sanitary engineers) to whom I do not allude in the least, but look up to with respect, because they spend time and money in search of science, that I cannot afford; but I do maintain that it is of the utmost importance that any plumber, having charge of a sanitary work, should thoroughly understand it; what our forefathers did must not always be our guide. I give them the praise which is their due, for we see plenty of their external work, which is good now; at the same time, London is much different now to what it was a few years ago; and science, in which Mr. Davies evidently believes, has taught us where their sanitation is at fault. Would he like to go back to the time when a w.c. was only a piece of stone carved to a certain shape, which was supposed to be the best one in the house? There are examples of them about now if he would like to copy them, and if he likes to stick to the old "dogs' ears" by all means let him do so; but he is doing a great injury to the craft, and to those members who follow his advice. No doubt the trade societies are doing much work in the way of technical education, and I am very pleased to hear it, only I think they must be hiding their light under a bushel, for this is the first intimation I have had of it, and I sincerely hope that they may go on with it; but am afraid, if they follow our friend's teachings, they will be a long time before their influence is felt. There are plenty of good men in the society who can teach us how to do work better than our forefathers, and it is to be hoped they will come to the fore.

Amongst the rest, I should like to see Mr. Davies, for he evidently possesses a certain amount of skill in description, and, but for his prejudice, would, no doubt, do a great deal of good. The health of the community depends upon us to an enormous extent, for it is of no use calling in Mr. Latham or Mr. Turner to one house if Mr. X. Y. Z. is trusted with the sanitary arrangements next door, and that is the man whose want of skill is visited upon us, and gets us an evil name by undertaking work for which he has not had the least study or training, and only steals or pirates our title which, unfortunately for those who employ him, does not carry the requisite knowledge: hence the value of a certificate to a thorough tradesman.

Mr. Hellyer is the first man, to my knowledge, who has stood forward on a public platform to speak to us plumbers on these principles, and our thanks are due to him for his efforts in the cause, which must eventually bear fruit to our advantage.

I conclude with the same remark as our old friend Mr. Stalder made when there were expressions of disapproval made at the first lecture: "Don't do that—let's hear him."—I am, &c.,

WRIGHT CLARKE.

64, Holden-street, Shaftesbury-park.

SIR,—Thanks for your insertion of my letter of last week. I must, however, intrude once more on your valuable space. As a matter of duty to my brother-tradesmen, and especially on behalf of the "A. S. P.," I made it my business to attend the second lecture of Mr. Hellyer on the above subject, and found he was, in some measure, prepared to make his lecture more practical by having some "wiped joints" for exhibition.

Mr. Hellyer must really pardon me; but when he calls into question the inefficiency of provincial plumbers, I must suggest that no better work is turned out than that by Messrs. Wallace and Connell, Glasgow; Bennett Bros., Liverpool; Ross and Murray, Dublin, and some others I might mention.

Now for Mr. Hellyer's practice. In describing to his listeners the joints that he had for objects, and the manner of making them, he forgot that, like children learning A B C as preparatory to reading, the plumber must be taught to prepare a joint before making it; this he told them, but forgot to mention two of the most important points. He will, perhaps, rectify this in his next lecture.

Now, as regards the "A. S. P.," whom I especially represent, I wonder that Mr. Hellyer after, in his last lecture, deprecating its members' abilities, should employ Mr. R. Midland (one of the Society's prime movers) to make his sample joints.

When asked who made these joints, why could he not candidly answer the question, instead of attacking one of of the members of a rival firm—viz., Mr. John Smeaton?

For the satisfaction of the members of the trade, I may say, after an inspection of the large joint (about which there was some discussion), that it was not a rolled joint, as many supposed.

Want of time precludes my saying any more at present; but if you will grant me space in your future issues, I will endeavour to give you further analyses of these lectures as they occur. —I am, &c., P. J. DAVIES, M.A.S.P.

SIR,—I have read what seems to me the rather hypercritical remarks under this heading, which appear on p. 626, from Mr. T. P. Davies. He falls foul of Mr. Hellyer for not properly explaining "what is a plumber?"—but it is rather curious to notice his neglect to fill up the hiatus himself.

If we were to carry out the proverb that "example is better than precept," as in Mr. Davies' case, then plumbers ought first to become certified civil engineers, and then forsaking engineering, turn their attention to plumbing. The practical result of this, however, would be to produce kid-glove plumbing dandies who would turn up their noses at all the "dirty work" connected with plumbing,* and leave the really useful handicraftsmen to be got from elsewhere.

I need not say more upon this point, but leave Mr. Davies to explain if he chooses. And as for Mr. Hellyer, seeing his lecture on May 17th was only the opening one of a series, there was no necessity for him firing off all his powder in the first volley.

There is one curious idea strikes me in connection with Mr. Davies' letter—viz., this, that seeing the wonderful quantity of certificates and accomplishments he confesses to, how comes it that his name, works, and teachings, are so unknown to the readers of your journal, and not only to the ordinary readers, but also to myself, who, as a practical plumber having an interest in sanitary work, and ideas always, for many years back, kept an eye open for the advent of anything bearing upon the progress of sanitary knowledge?

As to Mr. Davies' assertion or notion that "sanitary engineer" is "a title to be discarded by all plumbers, and used only by such men as Mr. Baldwin Latham and Mr. Ernest Turner." I beg to disagree with him. I happen to be a practical plumber, and having once adopted the title—often it had been ascribed to me by the public—I have no intention of disusing it. Mr. Baldwin Latham is a gentleman whom I highly esteem as an engineer, and so do I esteem Mr. Turner as an architect, and both especially from the particular attention they have devoted to improve sanitation; but, to meet the public wants, an opening has been made for men, who are neither "C.E.'s" nor "F.R.I.B.A.'s," to use the title of "Sanitary Engineer," and *for usefulness to the public* there are no better men qualified to rightly assume the title than first-class plumbers who know both the theory and practice of plumbing, including house drainage. If the plumber is ignorant of the latter (as so many plumbers are, who yet may be good lead-workers) then he has no business to style himself a "sanitary engineer."*

Such "sanitary engineers" as I refer to, including myself, would have no difficulty, if called upon by the "Board of Trade," or by Tom, Dick, or Harry, out of it, "to repair a leaden pipe." After the late severe frost, and when, to please our customers, we ought to have been able to cut up each plumber into half-a-dozen, I found it no more "dirty work" to handle the soldering cloth in the forenoon, than to write out a sanitary report in the afternoon.—I am, &c.,

W. P. BUCHAN, Practical Plumber and S.E.

ARCHITECTURE AT THE ROYAL ACADEMY.

SIR,—One of your recent correspondents on the above very rightly says, that through the preponderence of pen-and-ink drawings, this gallery lacks interest. It is undoubtedly one of the poorest exhibitions since the commencement at the Academy. Your correspondent, "H. M.," states that a preference is given to the drawings executed personally by the architects. If this is so, it is to be regretted: architects are not necessarily artists, nor can many afford the time for making artistic drawings without sacrificing other duties. What matters it whether the architect personally makes the drawing or not? What is looked for at the Royal Academy is work of the highest class, and he who sends it is most entitled to preference. When we remember the beautiful coloured drawings exhibited from time to time by the late Sir Gilbert Scott, and a little further back the drawings of the late Mr. Tom Allom, and then these drawings which some of our leading architects are content to be represented by, and which, though valuable for illustrative purposes, are no more worthy of the Royal Academy than so many framed illustrations from the architectural journals would be, the comparison is melancholy. Let the very old story of blue skies and misleading drawings be buried: it never was more than an invention to frighten committees against more formidable rivals, and never succeeded. A naturally and artistically coloured drawing never suffered from such a drawing as is usually described. Architects have at the Royal Academy an opportunity of showing their work to the nation: let them take advantage of the privilege, and put it in its best form.

If drawings such as Mr. Herbert Gribble usually contributes, have been rejected, to hang a score or two of these etchings which are nearly all alike, there is just cause for complaint.—I am, &c., F. W.

SIR,—With reference to the letter signed "An Old Tee-Square" in your impression of the 27th inst., kindly allow a friend of Mr. T. E. Collcutt's to say for him—during his absence in America—that no drawing of his was this year sent to the Royal Academy, and therefore none was rejected. —I am, &c, SET SQUARE.

RUINOUS AND DANGEROUS BUILDINGS.—DANKS V. WEST BROMWICH IMPROVEMENT COMMISSIONERS.

SIR,—Your report of the judgment in this appeal in the Court of Queen's Bench is incorrect, and as it is a most important matter, affecting the terms of the notice served by nearly all surveyors to urban authorities with respect to ruinous and dangerous buildings, I must ask you to correct the report in your next issue. Two questions were submitted to the Court. 1. Was the notice good which was served by me upon the appellant, under the 10th and 11th Vict. c. 34, Sec. 75, to "take down, secure, or repair" a building which I considered dangerous, or ought the notice to have specifically stated whether the appellant was to take it down, or to secure it, or to repair it. 2. Did the

* M.D.'s have often work to do that is both "dirty" and dangerous; but that does not prevent them doing it.

* I quite agree with the idea that parties styling themselves "Sanitary Engineers," who have neither the necessary professional nor practical knowledge implied, are simply sanitary *quacks*, no matter how large the brass plate upon the door may be.

magistrates, acting as they believed under decided cases, properly refuse to hear evidence tendered by the appellant, as to the condition of the building complained of?

You report that the Court held that the notice should have stated whether the appellant had to take down, or to secure, or to repair the building, and therefore the case was sent back to the magistrates to be reheard, whereas the Court gave judgment for the respondents on the 1st point, and for the appellant on the 2nd, and held the notice to be good in the form it was given, but sent the case back to be reheard, and determined by the magistrates on the 2nd point—*i.e.*, the improper rejection of evidence.

Thanking you for the correction,—I am, &c.,

JOHN T. EAYRS,
Surveyor to the West Bromwich Improvement Commissioners.

Surveyor's Office, Town Hall, West Bromwich, May 31st, 1881.

HOUSE WARRANTY.

SIR,—The article upon this subject, at page 567, deals with a matter that is of the highest importance to all Englishmen. The existing law, as you explain it, seems to be anything but creditable to England. The seller of an ounce of coffee mixed with chicory, which can do little harm to either it or its user, may be punished according to law; but he who sells or lets an unhealthy and disease-breeding house gets off scot free, no matter how much misery and death may result.

There is surely something decidedly wrong in such a state of affairs, and the blame lies at the door of the law-makers. To tell the purchaser or tenant that he ought to have examined the house properly before he bought or took it, is merely shifting the blame of a robbery from the robber to the ignorant resetter. The action or inaction of the law, in this case of house warranty, implies that faulty and disease- and death-causing houses may exist, and may be put up for sale; there is something unseemly in that, however, and such a condition of affairs is a disgrace to the law. It ought to be the law that such houses ought not to exist, or if they existed that they ought not to be allowed to be inhabited until they were put right.

By its present action or bearing, the law seems to me to make itself accessory to the disease and death which may be brought on by inhabiting bad houses. It has first neglected to look after the proprietor or builder, and then it actually protects the vendor! And all this too in the most Christian country in the world. How the gods of ancient Rome must split their sides with laughter.

In regard to houses (and, in fact, all buildings where people congregate) they ought not to be allowed to be occupied, not merely in the interest of the tenant, but also in the interest of the public in all the tenant's relations with the public; and one especial point I would refer to is the danger to the tenant's friends from their visiting his house—*e.g.*, supposing that Lord Coleridge should visit a friend's house which, unknown to his friend, was faulty, how would he feel towards the proprietor or builder if he caught fever in it?

We are all liable to such risks far more than we ought to be. Money makes life kick the beam every day. The sooner, for the general good, this is rectified the better. In Scotland, in some respects, the law, as to the healthy condition of the house, seems to be more favourable to the tenant than in England; as I understand the tenant may remove until the house is sorted, and charge expenses against the landlord; and I believe such expenses, in some houses examined by me, have been got. In the case of Granger v. Scottish Heritable Security Company (Limited), which is published in the March 2, 1881, issue of the *Scottish Law Reporter*, the tenant left the house and refused to go back after it was sorted, as it took a long time to sort, and he gained his case.

The Lord Justice Clerk, in concurring, said:—"Because the sanitary condition of such houses is a question of the deepest importance."

It would be to the interest of all good builders and proprietors, who desire to see good houses, that better supervision should be exercised over buildings when being erected. This would tend to put a stop to the cheap stuck-up jobs of the jerry builders, and so allow fair prices to be given and got for good work.—I am, &c.,

W. P. BUCHAN.

21, Renfrew-street, Glasgow, May 30.

CHIPPING NORTON CEMETERY COMPETITION.

SIR,—Mr. Saunders having, in your last number, stated that all the competitors in this trumpery matter were aware that detail drawings were to be made before the premium would be paid; I beg leave to state that I, for one of those who were foolish enough to send in designs, was aware of nothing of the kind, nor do the conditions (advertised in your issue of Feb. 4th) name anything whatever beyond "competitive plans," and "complete specifications," and "estimate of the cost." The Town Council appear to have been clever enough to get their drawings by competition for very considerably less than they would have to pay had they instructed the first man they came to and spared all the rest their trouble. The reason Mr. Bruton "did not compete" was, no doubt, that he was less prepared to be a dupe, and had more respect for himself and his labour than, Sir, yours, &c., ONE OF THOSE WHO DID.

BUILDERS AS ARCHITECTS.

SIR,—Under this heading "M." deplores that a firm of builders have designed a West-end mansion themselves, and are carrying out the work. As a set off, may I add that the contract for building the Newtown Church, at Exeter (illustrated in your issue for March 4th) has just been let to the Diocesan Surveyor of that city! What *are* we coming to? Builders become architects, and architects builders! As our well-meaning friends Messrs. Moody and Sankey used to sing:—"What will the harvest be?"—I am, &c.,

MUM.

SIR,—Referring to your last week's issue, does your correspondent "M." really think that one of our old building firms (granted, of course, that he refers to some firm of standing) is not in a position to make as well designed elevations, and better arranged plans, than the vast majority of the members of his profession? And does he intend it to be inferred that the employer gets better value for his money, and is left in a happier frame of mind after the accounts are paid, when he has employed an architect? I cannot, of course, say whether the employer would "abuse" his architect should he endeavour to carry out his own design; but I suspect the latter would think twice before exposing himself in the way he undoubtedly would!—I am, &c., P. C.

THE EXHIBITION AT THE ALBERT HALL.

SIR,—It would have been well if "Fair Play" had made an examination of the drawing in question before he wrote his remarks. I know the church perfectly well, and the peculiar canting of the eastern bays of nave; but this peculiarity does not account for the error in the perspective pointed out—rather the contrary.—I am, &c.,

THE CRITIC.

CHIPS.

The corner-stone for a new Masonic hall for Meltham, near Dewsbury, was laid on Wednesday week. The building will cost £800, and is being erected from plans by Bro. W. Teale. The contracts are all let to local tradesmen, the principal one, that for masonry, having been taken by Messrs. Wood and Mellor.

An inquiry was held at Sedgley on Tuesday week, before Capt. R. C. T. Hildyard, R.E., an inspector of the Local Government Board, into an application from the Sedgley local board for sanction to borrow £1,300 for providing public offices, to be built at High Holborn, Sedgley, from the designs of Mr. Brevitt.

The new free library at Richmond, Surrey, is to be opened by the Countess Russell on Saturday, the 18th inst.

Additions and alterations are now being made to the Catholic church at Estadale, Invernesshire, for the Right Hon. Lord Lovat, from the designs of Messrs. Pugin, of Westminster. Mr. Boulton, sculptor, Cheltenham, has an altar in hand for the same church. This is also from the designs of Messrs. Pugin.

On Monday, Edward Howell, builder, of Cogan Pill, was committed for trial by the Cardiff magistrates, on a charge of forgery.

The new church of St. Francis Xavier at Carfin, N.B., has been commenced. The architects are Messrs. Pugin and Pugin, of Westminster.

Intercommunication.

QUESTIONS.

[6520.]—**Cubing.**—How are approximate estimates made by "cubing out"? Are there standard prices per cube foot for different kinds of walls? How are these prices arrived at? Any information will much oblige.—YOUNG ARCHITECT.

[6521.]—**Queen Anne's Bounty.**—Is any commission allowed to, or charge made, by a nominee under Queen Anne's bounty for the erection of a rectory?—J. BELL.

[6522.]—**Bronze in London.**—Does bronze stand atmospheric influences in London? If so, why have the figures and the lions upon the Holborn Viaduct been painted green during the past week?—HARRY HEMS.

[6523.]—**Warehouse Construction.**—In building a warehouse of five or six floors, with outer walls of stone for storing provisions, we shall feel obliged to know the relative merits of floors in cement, supported by iron, and floors in wood, and their relative cost.—S.

[6524.]—**Damp Wall.**—A wall, brick and a half thick, S.W. aspect, is constantly damp in wet weather. Has been built six years, and is pointed with Portland cement. Can anything be done to stop the percolation of water through the bricks? Would a substitution of cement for plaster inside and a chemical application outside be effectual, or is there a less expensive method?—M.

[6525.]—**Clays, &c.**—I would feel much obliged for any information regarding a work on clays suitable for the coarser kinds of pottery and for brick and tile manufacture. Also for information regarding the production of bricks, &c., from one available sort of clay in variable shades of colour. I would also feel much obliged if any correspondent would give me the names of the leading makers of brick and roofing tile machines.—S. F. C.

[6526.]—**Plumbers' Work.**—I sometimes have to specify "cleaned wiped joints," and I believe how to wipe a joint properly is one of the tests of a good plumber. Will Mr. P. J. Davies, or some other practical plumber, kindly describe the process and explain the difficulty?—F. STONE.

[6527.]—**Charge for Sketches.**—A friend of mine called on me and told me he intended to build a pair of semi-detached houses to cost about £2,000, and he suggested that I should make him a sketch-plan in order that he would see if that class of house would let. I made him in all probably two or three rough pencil sketch-plans and elevations, but nothing has come of them. What ought I to charge for them each? I do not want to charge too much, as the sketches were only rough. An answer will oblige—A YOUNG BEGINNER.

[6528.]—**Levelling.**—Would any of your practical readers give me information on the following point: On commencing operations in levelling for a section, Baker, in his book on "Surveying," says that the staff should be placed "on the bench-mark" (say, a mile-stone, 3ft. in height). Would not this have the effect of making the surface line of section 3ft. too high at the starting point when plotted? Or does it mean to convey that the staff should be placed in the position of the bench-mark, instead of on it? An answer to this question will be thankfully received by—TWEEDIE.

[6529.]—**Road-Making.**—Would any reader, cognisant in such matters, kindly inform me the best method of constructing a good ordinary gravel road, with footpaths, for the laying out of a building estate, viz.—*a*, the nature and preparation of its foundation; *b*, thickness of and kind of material best adapted for the covering; *c*, the position, fall, and size of main sewer, say, for a 40ft. road; *d*, the method of carrying off the surface-water, and if this is in any way connected at all with the main sewer; *e*, the distance apart of gratings or gulleys, and method of connecting same with either sewer or surface drains; and last, but not least, the price per cubic yard or otherwise—1st of the road alone, and 2nd of the road, together with sewer and drainage. The mention of any good book on the subject will also be thankfully received by—TWEEDIE.

[6530.]—**Ink Stains on Marble.**—Will any reader kindly inform me the way to remove ink-stains from marble?—ARCHITECTUS.

[6531.]—**Party-Wall.**—I am making plans for a house, and intend carrying my wall above that of my neighbour's, whose eaves hang 18in. over my client's property. Can I cut off his eaves, and make him, at his own expense, form a gutter?—JUNIOR.

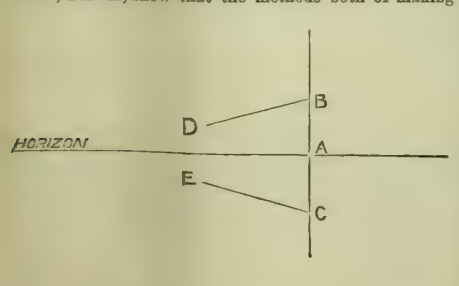
REPLIES.

[6442, 3, 4, 5, and 6.]—**South Africa.**—I have much pleasure in inclosing a cutting from the *Port Elizabeth Advertiser*, commenting on the articles in your issues of the 4th and 18th of March on "Engineering in South Africa." I have been in practice here two years, and during that time have been surprised and sorry to see so many young men who have held good positions as architects' assistants in England continually arriving by almost every steamer, only to find, when too late, that there is no chance of their getting employment, and I have no doubt that it is owing to erroneous statements such as appeared in the articles in question that induces them to emigrate to a colony which can find no room for them. I have frequently had as many as three in a week apply to me for a situation as draughtsman, and have known them at last, after fruitless attempts to get employment in their own sphere, obliged to take a situation as clerk or storeman in some establishment, or, as they have lately been doing, going to the front. In South Africa there are few rising towns where a young architect can have a chance of making a start. The principal buildings are in this town, Cape Town, and about three other towns, in which places the established architects have a moderate amount of work, and on account of the number of applications, situations in their offices are not very remunerative. I fully coincide with the opinion of the editor of the *Advertiser* in the articles, and should advise any young man not to be gulled by such statements

unless (as the writer implies) he wishes to come out to study botany or other foreign subjects; for I feel certain, from the remarks in the articles, the writer knows little of the civilised portion of South Africa. Hoping you will find room in your valuable paper for the insertion of the inclosed cutting, I remain, dear Sir, yours very truly, WILLIAM H. MILES, architect, Port Elizabeth, C. of G. H., May 5, 1881.

"Our attention has been directed to a couple of articles in the BUILDING NEWS of the 4th and 18th March on 'Engineering in South Africa.' The first deals chiefly with the Cape Railways, which the writer says have, with the exception of one, all been constructed on the 'departmental system,' which system, he adds, has not been considered on the whole a success, though 'much of the work done under the "department" is sound and good, and many of the engineers employed were possessed of ability and experience; but, unfortunately, their results were leavened by those who had no such qualities.' So far the writer is no doubt correct. It is the second article, dealing with 'South Africa as a field for young members of the profession' that we desire more particularly to notice here, in order to show how it is so many persons are induced to come out to the Colony, finding, to their utter disgust and disappointment on their arrival, that they have been completely 'sold,' and that there is not the opening or demand for their abilities they have been led to believe there was from information derived and accepted in good faith from such sources as we are at present alluding to, and from which we make a few excerpts. To substantiate the foregoing, there are at the present time three architects and surveyors in Port Elizabeth, only recently arrived from England, who would be glad to find employment in any sphere of labour, as in their own particular profession there is none. Referring principally to Government appointments in article number two, some very useful hints are given with regard to the instruments to be purchased, &c., and how spare time would best be occupied in the pursuit of some 'non-professional subject, such as astronomy or botany,' for, the writer adds, 'unless a man has some sound resources within himself, he will often find time hang intolerably heavily upon his hands, especially in up-country places, and the *ennui* thus produced is too often disposed of by Cape brandy.' The writer is evidently a man who has had some experience in the Colony, and, we judge, occupied a 'Government appointment'; but we are certainly surprised to read that 'there is room in abundance for private practice, which is growing every day, and is now in the hands of unlicensed adventurers.' and that, 'except in the Government service, there are few, very few, qualified architects. But there are several who, year after year, expend thousands on buildings, the most hideous that ignorance and vulgarity can conceive.' The most charitable construction we can put on such an assertion is that the writer must have left the Colony some years since, or else spent the greater part of his time in some small up-country town, studying a 'favourite non-professional subject' to cast off *ennui*. He certainly never could have paid Port Elizabeth, 'The Liverpool of South Africa,' a visit, for everyone will admit that 'ignorance and vulgarity' do not exhibit themselves in the modern buildings of this town. It is something new also to learn that 'any young engineer with ordinary qualifications could easily pass with a little rubbing up,' the necessary examination enabling him to become a Government surveyor. We were under the impression that the 'exam.' was an exceedingly 'stiff' one, and more than one C E. at present practising in the colony has only passed after days and nights of close application. We would fain write at greater length on the subject, but think we have said sufficient to prove how very difficult it is for young men in England to obtain any really reliable information with regard to employment in the colony, and we deem it our duty to contradict such misleading statements as appear in the articles in question. In South Africa, as in any other part of the world, there is a struggle for existence, and unless a young man is prepared to work—aye, and work hard—he had better remain in England, but as to there being '*abundance*' of employment for architects or any one, excepting mechanics and servants, we strongly deny."

[6475.] — **Advantages of Centrolineads.** — The answers to the question on this subject, which appeared in the BUILDING NEWS of April 15th, have drifted into a discussion on setting the instrument. This is but natural, since the only question that there can really be concerning it is whether its advantages compensate one for the trouble this setting gives. As the instrument is commonly made and used, this may possibly be doubtful, but an acquaintance with the principles which underlie it will, I think, show that the methods both of making



and using it may be improved. I speak from experience, for I made and set two centrolineads some three years ago which, without re-setting, have served me for making some fifteen or more drawings. The principles I speak of would take too long to explain here. They may be deduced by anyone who will take the trouble from Euclid III. props. 22 and 27, but applying these principles I suggest the following as the easiest and most practical method (for vanishing points that are not very far distant indeed) of setting a centrolineed once and for ever, with practically perfect scientific accuracy. The only inaccuracy is in the fractions of degrees in the angles, due to my desire to avoid decimals. Set the two arms that work on the pegs at an angle of 151° with one another, and the third arm so that the drawing edge bisects that angle. Then, in any drawing for which the centrolineed is required in consequence of the vanishing-point being outside the paper or table, find the so-called quarter vanishing point (really a quarter of the distance to the vanishing-point), and set off that distance on the centre line of the picture above the horizontal line, and also below as AB and AC. At B and C make the angles ABD and ACE, each 75½°, then the pegs on which the centrolineed is to work may be placed anywhere on the lines BD and CE, provided they are equidistant from the horizontal line (or from BC, which is the same thing, but more easily marked off). For vanishing-points which are so distant that BD and CE are by this method inconveniently far apart, the following dimensions may be substituted for the above—angle in arms of centrolineed 165½, AB and AC each ⅛ the distance to vanishing-point, and angles ABD and ACE each 82¾. The above dimensions are arbitrarily chosen from an indefinite number, which might be calculated because they give the simple ¼ and ⅛ distances. Many dimensions might be found making AB and AC unequal, and altering the arrangement of the drawing arm of the instrument; but though they would be frequently useful, the method of finding the positions of the pegs would be more complicated. The former will be found the most useful of the two, but if two instruments be kept set as above, one or other will, I think, be found to meet every case. For very close vanishing-points, the following dimensions might, perhaps, be useful:—Angle in arms, 141°; AB and AC, ⅛ distance, and angles ABD and ACE, each 70½°. It is hardly necessary to suggest that notes should be written on the instruments of the proportional distances AB and AC, and of the angles ABD and ACE, to which they apply. As to the centrolineads themselves, anyone may make his own by screwing three straight edges together, and find them much cheaper, stiffer, and more useful than the bought ones, more useful in two ways, first, the arms which work on the pegs may be made long enough to allow the instrument to work quite to the top and bottom of high drawings, which ordinary centrolineads will not do; and, secondly, there being no adjusting screw to get in the way, the instrument may be worked right and left by simply turning it over.—F. T. B.

[6489.]—**Examination in Building Line and Architecture.**—"W. M." is fond of inference. He says, "probably he" (meaning myself) "is a chip of the same block." Again, he is wrong, as I have never been connected with building except in my capacity of architect's pupil, assistant, and master. I have inspected works and workshops and believe if I had been with a builder for a short time, it would have been none the worse for me. Am aware that the R.I.B.A. would not elect as member any man who styled himself builder and architect; in my opinion it would be improper to do so, though there is nothing disgraceful in a man so styling himself as "W. M." says there is. The gentleman I referred to as being a candidate for associateship at the R.I.B.A. has since been elected; he stated plainly the facts I mentioned on his form of application, from whence I drew them, also knowing him personally have good reason to believe he has ceased having anything to do with the building trade. In a letter signed by "M." in last week's issue on "Builders as Architects," it is said "why should builders encroach in this impudent manner on the province of architects? How an architect would be abused if he attempted as a builder to carry out his own design!" Perhaps "M." has not heard that both engineers and architects have had to carry out their own designs, and all architects have to be prepared for such an emergency in the case of a contractor's bankruptcy according to the usual bankruptcy clause. The work is certainly often relet, but the architect has to be prepared to carry out the completion of the works, and has sometimes to do so. The reasons why builders have works given entirely into their hands are—1, want of taste, wisdom or knowledge on the part of the employer; 2, the employer believes the builder to be the best practical man, and not wanting any ornament, thinks he can dispense with the services of an architect; 3, the employer's experience of discreditable architects whom he has previously employed; 4, the ignorance of architects themselves, who often manage to have their works completed through the assistance and knowledge of the builders employed, after which they often turn on them with abuse and backbiting; 5, disgraceful conduct on the part of the builders who obtain the work. Mr. D. O. Boyd, in a letter to you April 29, said "the profession of an architect probably exhibits a greater disparity of culture among its members than is to be found among any other." It is certain that if the discreditable architects could be turned out of the profession, builders, except in the provinces, would never be employed in the double capacity of builder and architect. What "W. M." fails to see is that a man after starting in one business may leave it for a kindred business which he prefers, and that his former work may benefit him. Many of our best artists and practical men have done so at one period of their lives. I have no wish to advise "Builder and Architect" to unite what are now two businesses, but if he should prefer one to leave the other. I have heard of an architect who was formerly a ploughman; certainly to commence as a builder is better training. I have seen a circular of a builder and architect who also called himself an undertaker, the idea struck me as a fine piece of irony.—HUGH MCLACHLAN.

[6489.]—**Examination in Building Line and Architecture.**—The business of a builder and the profession of an architect should, in the interests of the public, be conducted by separate individuals; but it would be of great advantage to the rising members of the profession to have a better knowledge of the "building line" than their present artistic fancies dictate. I know of one eminent professor of architecture who from choice spent some time working at the bench, &c., in one of our best builder's establishments, and Mr. Godwin has not too soon hit the right nail on the head by his proposed scientific bursary. And, as "W. M." seems to consider the social standing of an architect would suffer by the introduction of a young man from the bench, I would remind him that "Manners maketh the man," and such a one could not conduct himself with less propriety than is done by attacking your esteemed correspondent, Mr. Hugh McLachlan, in such an ungenerous and unpolite way.—ARCHITECT.

[6502.] — **External Plaster Coves.** — Portland cement is the best material for any external plaster work, as it is the most durable, sets quickly, and will take a large proportion of sand, its only objection for the purpose that I know of is its colour. In Laxton's "Price Book" you will find useful information on the subject. It is there stated that for plaster, Portland cement "will carry 9 of sand to 1 of cement," though in my opinion it is not advisable to use more than half that quantity of sand. Blue lias lime is stated by two authorities to be a good material. "Laxton says "for external plasterers' work it has been used with the most satisfactory results, but here again its slow setting tells against it." This is explained by the workmen not knowing when to leave it alone, and so, though cheap in itself, they add so much labour as practically to make it too expensive. Medina and Parian are also suitable: the latter is expensive but may be mixed with Dorking or blue lias lime. All the cements named are quick-setting, and Dorking lime sets quicker than blue lias, so that by mixing them with Parian the setting of the latter would be retarded. Blue lias lime and Medina cement should have three of sand to one of lime, Parian cement equal proportions. For colouring material use coloured sands or ground glass, stone or brick. Red brick well ground will give the pink colour desired, the exact proportion being ascertained by experiment; the bricks should be of fine quality, old tiles and flower-pots might be ground up for the same purpose. Sands and ochres might be used to obtain yellow or brown colours, ground Bath stone, &c., for a cream colour. It is not advisable to use chalk, chalk lime, or ordinary plaster, as they would be washed out by rain. A white colour would be difficult to obtain: it would soon get dirty, and personally I should not admire it as it would be out of place. Read article on "Decorative Plaster" in BUILDING NEWS, Nov. 5, 1875; also paper by Mr. Rowland Plumbe, F.R.I.B.A., before the Architectural Association on the same subject between 1870 and 1872 inclusive, unfortunately have not the means ready to ascertain the exact date.—HUGH MCLACHLAN.

[6511.]—**Canada.**—If your correspondent would communicate with me I might be able to give him some information that would be of service to him.—C. BENNET, 32, Cadogan-street, Glasgow.

[6511.]—**Canada.**—I shall be on my way for a holiday trip through Canada and the United States by the time these lines are in print. If "Glasgow" will wait a few weeks he shall read in these pages my impressions, written upon the spot.—HARRY HEMS.

[6513.]—**Air and Light.**—If A. has had an old building with ancient lights on his site previous to the erection of the present building, which has only been built seven years, he could claim his right, but otherwise B. can build as he likes, as A. must have enjoyed an uninterrupted access of light for a period of 20 years to claim protection to his windows. If "M." refers back to the BUILDING NEWS of April 29th, a similar question is answered.—WALTER J. N. TOMLINSON.

[6513.]—**Air and Light.**—A. cannot prevent B., as A. has not acquired "ancient lights." — BANISTER FLETCHER.

[6513.]—**Air and Light.**—As A.'s freehold house has not enjoyed a prescriptive right to light over B.'s land, A. cannot prevent B. building beyond a certain height.—G. H. G.

[6518.]—**Local Surveyors' Powers** —If the other plots of building land are independent, the sanitary surveyor has no right to ask to see the plans intended for them till they are about to be built upon. As regards the plans of a building submitted, the surveyor has power to reject any plans, though such power ought to be exercised with moderation.—G. H. G.

[6519.]—**Appraiser's Licence.**—This is a question which has been repeatedly answered. There are many surveyors who measure and value work without an appraiser's licence; legally whenever the valuation is required for arbitration, the licence is necessary.—G. H. G.

CHIPS.

The Glamorganshire Workmen's Cottage Company have adopted plans prepared by their architects, Messrs. James, Seward, and Thomas, of Cardiff, for the erection of 67 cottages on their estate at Upper Grangetown, Cardiff.

The foundation-stone of a new Primitive Methodist chapel and schools will be laid in Station-street, Newport, Mon., on Whit-Monday. The buildings will replace older ones on the same site, and will cost £2,000. Accommodation will be provided for 550 persons in the chapel, and for 350 scholars in school and class-rooms. The architects are Messrs. Habershon and Fawkner, of Newport.

The new Presbytery attached to the Church of the English Martyrs, Great Prescot-street, Tower Hill, is now in course of erection. It is being carried out from the designs of Messrs. Pugin and Pugin, of Westminster. Messrs. Kelly and Son are the contractors.

A new police-station, with lock-up cells, is about to be built at Llanelly, from the plans of Mr. T. George, of Carmarthen, county surveyor for Carmarthenshire.

Mr. Thomas Stevenson, C.E., of Edinburgh, who was appointed by the Board of Supervision to report on the rival schemes proposed for the water supply to Carnoustie—that from the Brax and that from the Krombie—has issued his report in favour of the former plan, but recommends that the works be supplemented by those taking water from the Monikie-burn. The Public Works Loan Commissioners have accordingly granted a loan of £6,000 for the execution of the works.

A new church and convent has just been commenced at Dumfries, from the designs of Messrs. Pugin and Pugin, of Westminster. Mr. John Devlin, of Glasgow, is the contractor.

PARLIAMENTARY NOTES.

LINCOLN'S INN-FIELDS.—Sir E. Wilmot, last week, asked the First Commissioner of Works whether any arrangements were in progress, and, if so, what arrangements, for opening the enclosure in Lincoln's Inn-fields as a recreation ground for the public. Mr. Shaw-Lefevre: I believe that a proposal has been made to open Lincoln's Inn-fields to the public, but I am afraid it has not made much progress owing to the legal difficulties raised by the householders in the neighbourhood. The question is one which concerns the Metropolitan Board of Works more than the Office of Works.

NEW MUSEUM AND LIBRARY IN DUBLIN.—Mr. Dawson asked the Vice-President of the Council last week whether, before deciding on any plans for the building of the new Science and Art Museum and National Library in Dublin, the Corporation of Dublin would be consulted; and whether in the construction of the National Library regard would be had to the improved mode of construction which separated the public reading-rooms from those in which the books were stored. Mr. Mundella: There has been no delay since the matter came into our hands, except what we have experienced from the City of Dublin itself. In consequence of local opposition, we have been thrown back upon the Kildare-street site, for which, in concert with the Board of Works, we are making arrangements to secure plans by public competition. I have no doubt an opportunity will be given for the exhibition of the competing plans, and their criticism by the corporation and the public at large. The hon. member for Carlow may rest assured that the Government will do what they can to secure the best arrangements in the library. They are as anxious to push this matter forward as hon. members themselves can be.

GUILDFORD, KINGSTON, AND LONDON RAILWAY.—On Monday the Select Committee on this Bill decided that the amended preamble was proved, and expressed themselves satisfied with the agreement between the Company and the South-Western Company. The amended Bill states that from Fulham to Surbiton the line shall be constructed by the promoters of the original scheme, but from Surbiton to Guildford the railway will be constructed by the South-Western Company. There will be some deviations, the principal of which is that the branches to Little Bookham and Ashstead have both been abandoned in favour of a line which will cross Great Bookham Common and join the South-Western and London, Brighton, and South Coast railways at Leatherhead. The conditions as to the bridge at Putney sought to be imposed by the Metropolitan Board of Works, viz., that the bridge shall be as nearly as possible parallel with new Putney bridge, that, like that bridge, it shall consist of five in place of nine arches, and that there shall be free passage across it for foot passengers, have been accepted by the Company. The total length of the proposed line is 33 miles, the estimated cost of constructing which is £1,298,304, being an average per mile of £40,734.

PREVENTION OF FLOODS.—The Duke of Somerset on Tuesday asked the President of the Council whether the Government would direct the Ordnance Survey to deal first with those Midland Counties now most liable to be flooded. The Marquis of Salisbury asked whether the Government would take some steps to stimulate the 6-inch survey. The Duke of Marlborough inquired whether the Thames would not be included in the Bill, because otherwise great injustice would be done. Earl Spencer expressed great regret that the Bill was not making progress in the House of Commons. It was not the fault of the Government, however, there being no less than eleven motions on the subject. Some of the motions were altogether obstructive. He would endeavour to ascertain whether the suggestion of the noble Duke (Somerset) could be carried into effect; but he understood there might be some difficulty in changing the plans laid down for the Ordnance Survey, which were formulated as far as 1890. He would also make inquiry on the subject referred to by the noble Marquis.

A SOUTH-WESTERN RAILWAY BILL.—A select committee of the House of Commons have passed an Omnibus Bill of the London and South-Western Railway, which, among other powers, authorises the widening of Waterloo station on the western side, the enlargement of Vauxhall station, and the making certain alterations in their lines near Nine-elms. Powers are also granted to enable the company to lay down an additional line of rails between Wimbledon station and Clapham Junction, with the object of erecting another station midway between these two places at a point known as Dunse-hill.

A new church of St. Saviour is about to be built at Woolcott-park, Bristol, from the plans of Mr. John Bevan, of Bristol.

STAINED GLASS.

ELY CATHEDRAL.—A stained-glass window was, on Tuesday week, unveiled with military ceremony in the cathedral. It forms a memorial to the late Hon. O. Duncombe, Colonel of Militia, and is placed in the south aisle of nave. The subjects are arranged in three divisions, that at the top being the Anointing of Saul, the central one the Raising of Samuel by the Witch of Endor, and that at the base the Death of Saul. The work has been carried out by Messrs. Clayton and Bell, of Regent-street, London.

LEGAL INTELLIGENCE.

A MISTAKE OF FACT.—THE MIDLAND LAND AND INVESTMENT CORPORATION (LIMITED) V. PETO.—This was an action to recover back £14,000, alleged to have been paid under a mistake of fact. It appeared that one Godbold having obtained possession of a plot of ground in Chancery-lane, entered into an agreement with the defendant by which the latter was to build upon it an extensive set of chambers for £77,660, according to certain plans and specifications already prepared; by the agreement, the defendant was not to deviate from the plans or to do extra work without the authority in writing of the architect, nor to do any extra work without the previous written consent of the plaintiffs, who were about to advance money to the amount of 70 per cent. upon the contract price of the works executed for the completion of the contract, under a contemporaneous tripartite agreement between themselves, Godbold, and the defendant. The plaintiffs, it was said, supposed that the original plans were being carried out, and they paid upon that footing; whereas, in fact, new plans were prepared and the buildings were erected, it was stated, for a considerably less sum than was contemplated, whereupon the plaintiffs declared there had been omissions and variations from the original contract, which had reduced the price of the work done, so that the defendant was entitled only to a reduced payment, and they brought this action to recover £14,000 paid, as they maintained, under a mistake of fact, the mistake being that the architect's certificates had been given upon the original plans and contract price, and not upon the actual value of the work based upon the bill of quantities. The defendants contended that the contract was for a lump sum of £77,660, and that the new plans, which were, moreover, sanctioned by the plaintiffs, resulted not in a decrease, but in an increase of work. At the trial before Mr. Justice Denman, at Warwick, the jury were discharged, and the learned Judge ultimately gave judgment for the defendant. The plaintiffs appealed. Lords Justices Bramwell, Brett, and Cotton, on Tuesday, in the Court of Appeal, affirmed the judgment of Mr. Justice Denman, and held that no money had been paid under such mistake of fact as to entitle the plaintiffs to recover it back from the defendant.

SLANDERING A BUILDER.—LACK V. D'EPINEUIL.—This was an action tried at Guildhall on Wednesday to recover damages for alleged slander and malicious prosecution. The plaintiff is a builder and house-decorator, carrying on business at Lavender-hill, in Surrey, and the defendant, Count d'Epineuil, resides at the Red-house, Ashford, near Staines. In June, 1880, the defendant, wishing to have certain repairs done to his house at Ashford, advertised for tenders, and at the end of July the plaintiff agreed to do the repairs for some £150. He was paid £15 a week, on the certificates of the architect employed by the defendant, until, at the end of September, he told the latter that he was unable to complete the work at the contract price. Count d'Epineuil then agreed to pay him an extra £25. At the beginning of October the defendant further undertook to pay for the paint or other materials to be used by the defendant, and on the 19th of October a number of things were removed by the plaintiff from the defendant's house, among which, as the latter had then supposed, was a quantity of paint for which he had paid. The plaintiff, at the request of the defendant, called at his office at 40, Chancery-lane, on the 21st, when the slander, imputing that the plaintiff had been guilty of a felony, was alleged to have been uttered. Almost immediately afterwards the defendant applied to a magistrate and obtained a warrant for the apprehension of the plaintiff on a charge of having stolen the paint, and he was in fact arrested on the evening of the 28th. He was brought before a magistrate, General Brownrigg, on the following day, and remanded until Monday, November 1. General Brownrigg, believing that the plaintiff, who was only spoken of to him as being a contractor, would have no difficulty in finding two householders who would give bail for him in £100 each, and also none in himself finding it for £100, called upon him to do this; but he, being quite unable to obtain it, had to be taken to the House of Detention at Clerkenwell. His case was to have come on for hearing before the justices at Sunbury on November 1, and he had then been released on his own recognisances in £20, as, owing to the pressure of business, it could not be disposed of on that day. The Justices heard it on November 8, 1880, and dismissed the charge. The defendant's case was that, though he had been mistaken, he had acted *bonâ fide* and without malice in the matter, and that he had had reasonable and probable cause for charging the plaintiff with having removed his paint. The hearing of this trial lasted the greater part of two days, and the case was settled at the conclusion of the opening speech of the counsel for the defence, a verdict being taken for the plaintiff, by consent, for £50.

WATER SUPPLY AND SANITARY MATTERS.

WHITCHURCH, SALOP.—An inquiry was held at the town hall, Whitchurch, before Mr. J. Thornhill Harrison, C.E., one of the inspectors of the Local Government Board, into an application of the Whitchurch local board for sanction to borrow £11,000 for works of sewerage, water supply, and street improvements, and for providing slaughter-houses. Mr. Wyatt, the engineer to the board, explained the plans he had prepared, and showed that the sewage would be taken to Hadley's farm and there treated; the water supply was to be drawn by pumping from a reservoir to be formed at Fenn's-beck, two and a half miles from the town; the water was very hard but potable. The inspector suggested that it would be better to get a supply from the new red sandstone formation if possible, and recommended that in place of a settling tank a self-acting flush tank be provided at the sewage works.

TAUNTON.—A system of works of water supply is being constructed for the town council of Taunton at a total cost of about £29,000, and the result has been satisfactory. The work was originally carried out under the supervision of Mr. Easton, C.E., but more recently under that of the borough surveyor, Mr. J. H. Smith. The new supply is drawn from a well on Leigh-hill, and a tunnel 1,130ft. in length, and 5ft. 6in. by 4ft. in diameter, is about to be constructed from the bore-hole to the Taunton side of the hill, whence it will be conveyed to a new reservoir. For the tunnel, which will be constructed of flint-stone, the tender of Mr. Crokam has been accepted at £1,118.

BORTH, NEAR ABERYSTWITH.—On Thursday week, the chairman of the Aberystwith rural sanitary authority formally opened the works of water supply just provided for the village of Borth. From springs on neighbouring farms the water is conveyed by gravitation to a reservoir having a capacity of 50,000 gallons. From thence, 1,650 yards of 6in. cast-iron pipes, and 260 yards of 4in. pipes, take the water into the village. The service is to be extended to the village of Glanywern. Mr. J. E. Thomas, of Aberystwith, was the engineer, and Messrs. Edwards and Co., the contractors, except for the pipes, which were supplied by Mr. Spittle, of Newport, Mon. The cost has been £860.

CHIPS.

A new coffee-tavern at East-gate, Exeter, was opened on Monday by Bishop Temple. The tavern and the adjacent arcade buildings have been erected by Messrs. Stephens and Son, from the designs of Mr. James Crocker, of Queen-street, Exeter. The tavern is faced with Culm Davy red bricks, with Beer stone dressings and white diapering. The carving was executed by Mr. Harry Algar, of Plymouth, and the total cost of the tavern has been £2,500.

A new organ, built by Mr. Alfred Monk, of Camden Town, was opened at Margaretting Church, near Chelmsford, on Sunday week.

Two new stained-glass windows have been placed in the north aisle of Matlock parish-church. The one is a representation of "Christ, the Good Shepherd," the other of "Christ, the Light of the World," the latter being a reproduction of Holman Hunt's well-known picture. They have been executed by Messrs. Powell and Co., of Whitefriars, London.

The Dewsbury and Heckmondwike waterworks board have adopted plans by Messrs. Bateman, Hill, and Bateman, of Manchester, for taking down and reconstructing the viaduct across Smallden Clough, near Smallden-bridge railway station.

At the annual general assembly of the Free Church of Scotland, the following grants to new and enlarged churches were reported by the Church Extension Building Fund Committee:—Dowanvale Church, Partick, £1,375; Dalry, Edinburgh, £1,250; Queen's Cross, Aberdeen, £1,000; South Leith, £1,000; Bellshill, £750; West Church, Stirling, £700; Altnaharra, £200; Kilmalcolm, £150; Arasaig, £137 10s.; Struan, £50; and Beauly (additional), £30; total, £6,642 10s.

Our Office Table.

A MEETING in connection with the Association of Municipal and Sanitary Engineers was held on Saturday at Barnsley, Mr. A. W. Morant, of Leeds, borough engineer, president of the society, in the chair. Mr. Cross was reappointed secretary. Mr. Taylor, Barnsley, read a short paper, briefly noticing the population and the coal, linen, and other industries of the town, giving details in connection with the sewage scheme and health statistics. The sewerage is on the separate system. The maintenance of sewers in an efficient condition was a matter requiring constant vigilance, in consequence of the continual subsidence of the land through the working of the coal measures. He then noticed the size of the sewage farm, 78½ acres, and said that the effluent from it was now equal to a moderately clear drinking water. A very short discussion, in which the use of destructors was approved, followed, and afterwards the members visited the sewage farm and other places.

THE Leeds Fine Art Exhibition which opens on Monday will be one of decided merit. The oil-paintings, of which there are about 500, have already been all hung in the upper gallery, and rapid progress is being made in placing nearly an equal number of water-colours in the lower room. Whilst about a thousand pictures have thus been accepted, nearly seven hundred have had to be declined. The superintendence of hanging the pictures has been wisely intrusted to Mr. Wm. Hughes and Mr. C. B. Birch, A.R.A. The collection includes a large and powerful work, "Wind Swept," by Hubert Herkomer, as well as a smaller painting and four etchings by the same artist; also specimens of the talent of Ernest Parton, F. W. Lawson, T. J. Banks, H. Sykes, J. Smart, R.S.A., J. D. Watson, Richard Waller (a portrait of himself), A. Grimshaw, C. J. Lewis, D. Farquharson, and many others.

IT is a common custom to place coins in the foundation of a new building, but hitherto we are not aware of these being embedded in the "foundation" of a ship. From a discovery made the other day in one of the Orkney Islands this would appear, however, to have been a custom at one time in Spain. Seventeen years ago a Spanish schooner was wrecked at St. Catherine's, Stronsay, and since that time the keel and stern-post have remained embedded in the sand. During the recent spring tides, however, the wreck was dragged out with considerable labour, and the men are expecting to make good wages for their venture from the sale of the copper bolts and stern fittings. When the stern-post was separated from the keel, a copper coin, rolled up in tarred canvas, was found carefully embedded in the joint. The coin bore the date 1818, was in excellent preservation, and had evidently been placed there when the vessel was built.

THE second annual meeting of the Manchester Ruskin Society was held last week. The report stated that the exceptional severity of the weather and the many engagements of the members had been hindrances to the arrangement of meetings and classes in connection with the Society; but it had been found that a useful sphere of influence could be entered by using existing agencies in literary and debating societies, and several papers on the teachings of Mr. Ruskin had been read by the members of the Society at such gatherings. Much useful work had been done by correspondence. The Committee were justified in believing that the interest of many people in Mr. Ruskin's teachings had been stimulated by this means. The membership of the Society showed but a slight increase. There were many indications that in the immediate future their best course would be to work through existing agencies, and to endeavour to infuse the spirit of Mr. Ruskin's teachings into them; rather than for the present to strike out on any new and independent path.

THE patent double-meshed lime-screen, made by Mr. James Gregory, of the Portland Works, Lincoln, is one of those useful little inventions which make less noise but save much more money than others of more pretentious character. Any builder who once uses it will, we think, be pleased with it. The screen is double-meshed, giving two kinds of mortar. The angle of the mesh is so arranged that a perfect breaking up of the material is secured, and, with the larger screening surface, a saving in time and material is effected. The screens are in use by the Great Northern Railway Co., and many large contractors in the Midlands.

ACCORDING to the American *Industrial World*, to make brick masonry impervious to water, there may be employed two washes or solutions for covering the surface, the one, Castile soap and water, the other, alum and water, the proportions being three fourths of a pound of soap to a gallon of water and a pound of alum to four gallons of water, both being well dissolved. The wall must be perfectly clean and dry, and the air at least 50° F. The soap-wash should be laid on boiling, with a flat brush, and so as to form no froth. After remaining 24 hours to become hard, the alum-wash is applied in the same manner, but at the temperature of 60 to 70° After another 24 hours a second soap-wash is to be put on, this being repeated until the walls are impervious.

MR. WILLIAM PATERSON, C.E., whose name for many years has been identified with all the leading engineering undertakings in the north of Scotland, died at his residence at Larkfield, Inverness, on Sunday evening. In 1836 he assisted in the laying out of a line in Ireland, and two years later he was engaged on the Slamannan Railway. In 1845 he surveyed the projected line between Inverness and Perth, and when that scheme assumed practical form, along with Mr. Joseph Mitchell he was engaged, from 1854 until 1865, in carrying out the works of what is now known as the Highland Railway. Along with Mr. Mitchell, deceased was also surveyor of the Highland Roads and Bridges and Fishery Harbours in the North from 1839 to 1857. Prior to the passing of the present Roads Acts, he was Road Surveyor for Inverness-shire. His last work of any note was the survey, along with his brother, Mr. Murdo Paterson, of the Keith and Buckie Railway, the Bill for which was the other day preferred by the Parliamentary Committee to that promoted by the Great North of Scotland Company. Mr. Paterson has died in his 68th year.

THE sixth public annual meeting of the Sunday Society was held in the Freemasons' Hall, last Saturday (May 28), when there was a large and enthusiastic audience. Mr. Thomas Burt, M.P., the new president, was introduced to the meeting by the Earl of Dunraven. Mr. Burt delivered a long and able address in support of the opening of museums on Sundays, and the meeting was also addressed by the Earl of Dunraven, Mr. Mark Judge (hon sec.), Mr. C. H. Hopwood, Q.C., M.P., the Earl of Dalhousie, Mr. Philip H. Rathbone, J.P., of Liverpool, Mr. George Howard, M.P., the Hon. J. C. Dundas, M.P., and Mr. J. C. Wakefield, J.P., of Glasgow. The resolutions, which were passed with only one dissentient, expressed the Society's high appreciation of the Earl of Dunraven's leadership in the House of Lords, and requested Mr. George Howard to give notice of motion in the House of Commons for next Session, a duty which Mr. Howard expressed his readiness to undertake. The annual report, which was approved, stated the income during 1880 to have been £686, and the balance in hand on Dec. 31st last, £26 19s. On Sunday last a third visit was made by a party of the members of the Society to Apsley House, and the *Graphic* Gallery was also open to the members. It will be again open to them next Sunday, and on the two following Sundays the Society will issue tickets to the members of Workmen's Clubs who desire to visit the *Graphic* Gallery.

THE last coping-stone of the new Eddystone Lighthouse was unexpectedly laid on Wednesday by the Duke of Edinburgh, who is on an official visit of inspection of the Coastguard stations. At the Eddystone the Royal party were received by Mr. Douglas, chief engineer. They and Commander Le Strange landed on the rock and went through the old lighthouse. Thence they repaired to the new lighthouse, which has now been built to its intended height. Just as the Royal party arrived, the workmen were about to place the last stone to the cornice of the tower. This operation was immediately stopped in order that the Duke might perform the ceremony himself. After distributing the cement, his Royal Highness placed the stone in position, and, amid cheers, declared it to be well and truly laid. The Duke, as Master of the Trinity Board, laid the foundation-stone on the 19th of August, 1879.

THE work of restoration is still in progress at St. Albans, both at the western and eastern end of the fabric of the old abbey. At the extreme east the stone mullions and tracery are just finished for the large window of painted glass which is about to be presented to the Lady Chapel by the Corporation of London. The western front—the work of the Abbots De Cella and Trumpington—which has long been in an unsatisfactory and almost dangerous state, is being rapidly "restored" by Sir Edmund Beckett, who has obtained a faculty for that purpose. The *Times* understands "that the Early English entrance porches are to be preserved intact, or at all events to be restored stone by stone; but the great Perpendicular west window, the work of Abbot Wheathampstead, is about to give place to a new window of a decorated pattern, the cost of which will be borne by Sir Edmund Beckett, who has already inserted new windows at the western end of the northern and southern aisles."

ACCORDING to the last return of the Registrar General, the enumerated population of London, subject to slight revision, was 3,814,571 on the 3rd April last In 1871 the population was 3,254,260; the increase, therefore, in ten years is 560,311, a total not far from the total of Liverpool. The decennial rate of increase has been 17 per cent., whereas in 1861-71 it was 16 per cent., and in 1851-61 it was nearly 19 per cent. In an article on the extension of London, the *Times* says—speaking of the suburbs—"On the confines of the whole mass, we make our way with difficulty through a region of unfinished terraces, unfinished roads, brickfields, and all the ugliness that tells of the builder's advance, and calls down on him the wrath of Mr. Ruskin. The believer in the macadam formation of our roads will here see for himself that broken crockery and the refuse of the dust contractor are the components of many a London suburban thoroughfare. This is the order in which the metropolitan area and its population expand. It is perhaps pardonable if the sight now and then begets a fierce longing for a paternal despotism that would exile all builders and contractors for a term of years, or at least provide for the survival only of the fittest."

MR. THOS. P. CHAPMAN has submitted to our notice one of the first impressions of the George Stephenson Centenary Medal, designed, executed and registered by him to commemorate the centenary of the birth of the founder of the railway locomotive system. Celebrations of the day are to be held at the Crystal Palace and Newcastle-on-Tyne, besides many other local festivals in the provinces, and on the Continent, at Vienna, Turin, Liége and Amiens. The medal, which is a good one, is issued in connection with the George Stephenson Centenary Festival Committee, and is sold at sixpence, in pure white metal.

CHICAGO has found the results of her system of factory inspection so beneficial that she is now applying it to tenement houses. Six inspectors are now making a critical inspection of the tenements, and will continue it until the 7,000 tenements which, according to the *Chicago Times*, there are in the city, will have been examined. The *Times* says that the work has now been reduced to a system, and complete records are kept of all work done. These records consist of date, location, ward, district, name of owner or agent, description of building, number of rooms, number of families, with the number of persons in each, sanitary condition of the building, action taken in abating nuisances found, and explanatory remarks. Each inspector is provided with blanks, which he fills out at the close of each day's work. His report describes the condition of the plumbing, drainage, the local sanitary condition, and notes any violations of the city ordinances. In case anything is found about premises which is detrimental to health, a notice is served on the owner or agent, who is required to comply with the ordinances of the city relating to the abatement of nuisances. The new building ordinance of Chicago provides that "Any builder, or any architect, or contractor having charge of a building, who shall permit any building to be constructed in violation of the ordinance shall be liable to the penalties imposed by Sec. 1,140, which provides a penalty of not less than 10dols nor more than 100dols. for each offence."

AN American journal gives the following as a good filler for porous hard woods:—Use

boiled oil and corn starch stirred into a very thick paste. Add a little Japan and reduce with turpentine. Add no colour for light ash. For dark ash and chestnut, use a little raw sienna; for walnut, burnt umber and a slight amount of Venetian red; for bay wood, burnt sienna. In no case use more colour than is required to overcome the white appearance of the starch unless you wish to stain the wood. This filler is worked with brush and rags in the usual manner. Let it dry 48 hours, or until it is in condition to rub down with No. 0 sand-paper, without much gumming up, and if an extra fine finish is desired, fill again with the same materials, using less oil, but more of japan and turpentine. The second coat will not shrink, it being supported by the first coat. When the second coat is hard, the wood is ready for finishing up in any desired style or to any degree of nicety by following up the usual methods. This formula is not intended for rosewood, and will not be satisfactory if used therefor.

CHIPS.

A new co-operative store was opened at Berry-brow, near Huddersfield, on Saturday week. The premises are built of ashlar, and cost £1,700. Mr. Thomas Wood, of Huddersfield, was the architect, and the contractors were: Masonry, Mr. Allen Stocks, Berry-brow; joinery, Mr. J. Smith, Meltham; plumbing, Mr. W. Shaw, Berry-brow; and slating, Messrs. Goodwin and Sons.

A new police-court is being built in Bank-street, Hythe, near Folkestone. The facing materials are red bricks and Kentish ragstone, and Mr. Scott, of Hythe, is the contractor.

A new Presbytery is in course of erection at Cleland, near Motherwell, N. B. Messrs. Pugin, of Westminster, are the architects.

A stained-glass memorial window has been placed this week in Christ (Congregational) Church, Sneyd-park, Bristol. It is placed in the west front of the church, and contains 18 subjects taken from the Old and New Testaments. The window was designed and executed by Mr. Thomas W. Camm, of Camm Brothers, Smethwick, near Birmingham.

The grand hotel, Plymouth Hoe, has now been completed, by an extension equal to an addition of one-third. The new block is of four floors, and contains a smoke-room, 24ft. by 22ft., 18 bed and sitting-rooms, each 22ft. by 12ft., and in the basement is a laundry. Mr. Pethick, of Plymouth, was the contractor.

Lamplough's Pyretic Saline is refreshing, most agreeable, and the preventive of FEVERS, BILIOUSNESS, SMALL POX, SKIN DISEASES, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill. *Use no substitute* —[ADVT.]

Holloway's Pills are suitable alike for the peer and the peasant; the soldier, sailor, and emigrant may rely on them as the means of banishing sickness in all climates, and under all circumstances. They readily check bilious and feverish attacks, and prevent inflammation of the brain, liver, lungs, and kidneys.—[ADVT.]

MEETINGS FOR THE ENSUING WEEK.

TUESDAY.—Royal Institution, "Thomas Carlyle." By Prof. H. Morley. 3 p.m.
King's College, Strand. "Greek Sculpture." Lecture No. 2. By Dr. C. Waldstein. 3.15 p.m.

FRIDAY.—Architectural Association. "Colour Decoration as Applied to Architecture, from a Painter's Point of View." By R. Corbett. Election of Officers for 1881-2. 7.30 p.m.
Royal Institution. "Origin and Identity of Spectra." By Prof. Dewar, M.A., F.R.S. 9 p.m.

SATURDAY.—Architectural Association's Visit. 3 p.m.
Visit by St. Paul's Ecclesiological Society to St. Peter's Church, Berkhampstead, at 3 p.m., where a paper will be read by Rev. Canon Owen Davys, and at 5 p.m., to Northchurch. Train from Euston, 1.55 p.m.

Trade News.

WAGES MOVEMENTS.

YOUGHAL.—The boys attending the moulders in the Youghal brick-fields struck on Saturday for an advance of wages from 8s. to 10s. Trade is slack, and prices have fallen, so it is probable that the strike will be unsuccessful.

Doulting Freestone and Ham Hill Stone of best quality. Prices, delivered at any part of the United Kingdom, given on application to
CHARLES TRASK,
Norton-sub-Hamdon, Ilminster, Somerset.
—[ADVT.]

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General Repairs and Alterations Executed. Experienced Workmen always in readiness, and sent to any part of the country.—[ADVT.]

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BOX GROUND,
THE BEST FOR ALL EXTERNAL USE.
CORSHAM DOWN
CANNOT BE SURPASSED IN BEAUTY OF APPEARANCE FOR INTERIOR WORK.
PICTOR & SONS, BOX, WILTS.
(See trade advt. on p. XXV.) [ADVT.

TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender—it adds to the value of the information.

ALDENHAM.—For additions to a house at Aldenham, Herts, for Mr. C. T. Part. Mr. R. Nevill, F.S.A., 12, South-square, Gray's Inn, architect:—
Longmire and Burge (accepted) ... £1,613 0 0

BEXLEY.—For the erection of the new church at Bexley, Kent (exclusive of tower and spire). Mr. George Low, architect. Quantities by Messrs. Jonstone and Paine:—
Naylar and Son, Rochester (accepted) £4,769 0 0

CARDIFF.—For completing the free library and school of art buildings, for the town council (the original contractor having failed). Messrs. James, Seward and James, architects:—

Shepton, S.	£6,400	0	0
Davies and Cousins	6,250	0	0
Jones Bros.	6,200	0	0
Burton, C.	6,010	0	0
Lock, F. S., Cardiff (accepted) ...	5,994	0	0

COVENTRY.—For the erection of warehouse in Hales-street, Coventry, for Messrs. Matterson, Huxley and Watson. Mr. Herbert W. Chattaway, architect:—

Ensor, D., Coventry...	£2,320	0	0
Marriott, J., Coventry	1,950	0	0
Garlick, C., Coventry	1,898	0	0
Worwood, J., Coventry	1,847	0	0
Hallam and Co., Coventry... ...	1,825	0	0
Mayo, T., Coventry	1,766	0	0
Haywood, C. Junr., Coventry ...	1,680	0	0
Bacon and Son, Foleshill (accepted)	1,563	17	0

CROYDON.—For the erection of four cottages, St. James-road, Croydon. Messrs. H. Bran and Burnett, 14, Nicholas-lane, Cannon-street, E.C., surveyors:—

Sharpe and Mills	£1,010	0	0
Balaam Bros.	900	0	0
Chafen, S.	875	0	0
Crisp and Tomlin (accepted) ...	853	0	0

DEPTFORD.—For the construction of a new sewer from the Broadway, Deptford, to Lee-bridge, for the Metropolitan Board of Works. Sir Joseph W. Bazalgette, engineer to the board:—
Mowlem and Co. (accepted) ... £27,396 0 0

FINCHLEY.—For the erection and completion of a house in Cyprus-road, Church End, Finchley, for Mr. Alfred D. Cheney. Mr. John T. Henson, Gresham Chambers, Nottingham, architect:—

Larke, W. G. and Son	£1,090	0	0
Cooper, H., Finchley (accepted) ...	998	0	0
Gould and Brand	985	0	0

FOREST HILL.—For completing semi-detached villas, being Nos. 1, 2, 3, 4, 5, 6, and 7, Vaughan Villas, Devonshire-road, for Messrs. G. J. Coldham and V. Brettell. Messrs. Ebbetts and Cobb, architects and surveyors, Savoy House, 115, Strand, W. C.:—

Brown	£1,940	0	0
Newland	1,930	0	0
Holt	1,800	0	0
Nixon	1,797	0	0
Steel Bros.	1,720	0	0
Sanders	1,520	0	0
King	1,500	0	0
Williamson	1,380	0	0

GREAT PARNDON, ESSEX.—For alterations and repairs to Passmoor House, Great Parndon. Messrs. Gordon and Lowther, London, architects:—

Brown, Parndon	£1,352	0	0
Nicholls, Harlow	1,238	0	0
Dye, London	1,108	0	0
Taylor & Parfitt, London (accepted)	1,089	0	0
Sortwell, Harlow (withdrawn) ...	859	0	0

GREAT YARMOUTH.—For house, Gorleston, for Mr. J. Bately. Mr. J. W. Cockrill, Glencoe House, Gorleston, architect:—

Harbert, Great Yarmouth	£1,335	5	0
Springall, Great Yarmouth	1,000	0	0
Bray, Great Yarmouth	975	0	0
Howes, T., Great Yarmouth* ...	929	0	0
Blyth, S. W., Gorleston	924	0	0

*Accepted.

HIRWAIN.—For the erection of the Tabernacle Congregational Chapel:—
Morgan, J., Aberdare (accepted).

HONOR OAK.—For construction of roads and sewers on the Honor Oak estate:—

Marshall, J. G. B., Brighton ...	£3,333	0	0
Tyler, R., West Kensington Park	3,270	0	0
McKenzie and Co., Moorgate-st.	2,946	0	0
Acock, G., Cannon-street, E.C. ...	2,783	0	0
Dyer, J., Camberwell	2,773	0	0
Harris, W., Camberwell	2,743	0	0
Walker, A., Holloway	2,738	0	0
Woodham, H., Catford	2,618	0	0
Woodham, W. J., Penge	2,570	0	0
Nowell and Robson, Kensington*	2,320	0	0
Neal, G., Wandsworth Common...	2,300	0	0
Taylor, F. and Co., Pimlico ...	1,970	0	0

*Accepted.

IPSWICH.—For furniture and fittings at the new offices of the School Board, Post Office-buildings, King-street. Mr. Brightwen Binyon, architect:—

Bennett, J. B. and F....	£316	10	0
Fish, F. and Son, Ipswich	296	10	0
Durrant, J.	281	15	0

(Revised tenders were obtained when that of Messrs. Bennett was accepted at £240.)

ISLINGTON, N.—For the enlargement of a school in Thornhill-road, Islington, by 200 places, for the London School Board. Mr. E. R. Robson, F.S.A., architect to the Board:—

Lawrence, E.	£1,842	0	0
Grover, J.	1,782	0	0
Pritchard, G. S.	1,729	0	0
Williams, G. S. S. and Son ...	1,720	0	0
Wall Bros., Dale-road, Kentish Town (accepted)	1,699	0	0

[(*a*) cost of school buildings only, £1,396 10s.; (*b*) extra depth of excavations, £32 10s.; (*c*) works to present school (including additional cloak accommodation, &c.), £270; total, £1,699. Cost per head of (*a*), £6 19s. 1d.; total cost per head, £8 9s. 10d.]

LEWISHAM, S.E.—For works of kerbing and channelling, for the ensuing year, to be carried out for the Lewisham district board of works:—
Henson's Street Paving Co. (accepted) £665 0 0

[Lowest tender received, the highest being that of Nowell and Robson, £1,102.]

LONDON.—For the sinking of cylinders and other works preparatory to the deepening of the foundations of Waterloo-bridge, for the Metropolitan Board of Works. Sir J. W. Bazalgette, engineer to the board:—
Webster, W. (accepted on scheduled list of prices).
Estimated cost, £1,000.

MID KENT.—For constructing a sewer at Snodland, for the Malling rural sanitary authority:—
Marchant, H., Tonbridge (accepted) £108 0 0

NORBURY MANOR.—For completing houses on the Norbury Manor estate, for Messrs. Carter. Mr. E. P. Loftus Brock and Mr. R. C. Murray, joint architects to the estate:—

Julian, E. and Co.	£4,028	0	0
Mattock Bros...	3,896	0	0
Niblett	3,757	0	0
Howe and White	3,550	0	0
Syme and Duncan	3,100	0	0
Peacock Bros....	2,929	0	0
Allen and Hurden (accepted) ...	2,550	0	0

NORTHAW.—For Northaw Church, Barnet, Herts, to be built with tower, external face of Ancaster rubble and seating, &c., of oak. Messrs. Kirk and Sons, Sleaford, architects. Quantities by Mr. G. Hackford, 6, Queen Anne's-gate, Westminster:—

Martin and Wells, Aldershot ...	£18,412	0	0
Scales and Morris, Hertford ...	13,612	0	0
Wade, W., St. Neot's	13,500	0	0
Hunt, T., Ware	12,590	0	0
Rudd and Son, Grantham ...	12,100	0	0
Goddard & Sons, Farnham, Surrey	12,060	0	0
Miskin, St. Albans...	11,956	0	0
Hampton, W., Hoddesdon, Herts	11,838	0	0
Williams, T., 6, Harrington-sq., London	11,774	0	0
Jones, W. C. and Co., Gloucester	11,750	0	0
Rayment and Son, Hertford ...	11,212	5	2
Bates, Stevenage	10,717	18	0
Bentley, Waltham Abbey ...	9,930	0	0
Gibson, G., Southall, Middlesex	9,929	0	0

PECKHAM, S. E.—For the erection of a school to provide accommodation for 1,100 children in Lyndhurst-grove, Peckham, for the London School Board. Mr. E. R. Robson, F.S.A., architect to the Board:—

Marsland, J....	£10,985	0	0
Higgs and Hill	10,980	0	0
Atherton and Latta	10,847	0	0
Lathey Bros....	10,709	0	0
Jerrard, S. J.	10,543	0	0
Kirk and Randall	10,517	0	0
Nightingale, B. E.	10,481	0	0
Shepherd, W.	10,354	0	0
Grover, J.	10,240	0	0
Tongue, W., Plumstead (accepted)	9,992	0	0

[Cost of site (area 27,475 square feet), £4,213; (*a*) cost of school buildings only (including closets), £7,611; (*b*) cost of tar pavement and playground, £245; (*c*) cost of boundary-walls and gates, £614; (*d*) cost of teachers' rooms, £300; (*e*) cost of schoolkeeper's house, £350. Special expenditure chargeable to the site—(*f*) extra depth of foundations, &c., £250; (*g*) lowering site to level of roadway, £460; (*h*) lowering railway embankment, £162; total, £9,992. Cost per head of (*a*), £6 18s. 4d.; total cost per head, £9 1s. 8d.]

RHONDDA VALLEY.—For making a new road from Porth to Ynystir, for the Ystradyfodwg board of health:
Green, J., Ferndale (accepted) ... £350 16 10
[Six tenders received.]

RIPLEY, DERBYSHIRE.—For the execution of drainage and other works at the southern sewage farm, for the local board of Ripley, Derbyshire:—

Hallam, R., Codnor	£2,152 15 3½
Beardsley and Pounder, Ilkeston ...	524 14 6
Breedon and Spencer, Wessington	491 0 0
Hawley, J., Ilkeston	486 10 0
Cope, J., Ripley	466 0 0
Wain, J., Ripley	360 3 6
Ween, Rogers and Wynyard, Whittington (accepted)	242 19 11
Engineer's estimate	450 0 0

SOUTHWARK.—For alterations to premises, Southwark-street, for Mr. James Sinclair. Mr. Douglas Young, surveyor:—

Castle, W. and H. (accepted).

SOUTHWARK.—For reinstating premises after fire Southwark-street, for Messrs. Easton and Anderson, Mr. F. Chambers, architect:—

Castle, W. and H. (accepted).

SOUTHESK.—For the erection of the new Southesk Viaduct, on the Arbroath and Montrose Railway (in place of the one designed by the late Sir Thos. Bouch, condemned by Col. Yolland, of the Board of Trade). Mr. Galbraith, C.E., London engineer:—

Arrol, W., and Sons, Glasgow (accepted).

SOUTHWARK, S.E.—For erecting three teachers' rooms and providing cloak accommodation for the three departments of the school in Orange-street, Borough, for the London School Board. Mr. E. R. Robson, F.S.A., architect to the Board:—

McCormick and Son	£813 0 0
Pritchard, W. H.	779 0 0
Nightingale, B. E.	774 0 0
Julian, T. E. & Co., Marshall-st. S.E.*	675 0 0

*Accepted.

SOWERBY, NEAR HALIFAX.—For providing accommodation for twenty-two head of cattle, stabling for two horses, and appurtenances at Hathershelf farm. Accepted lowest tenders:—

Mason and bricklayer:—Wilkinson, W., Mytholmroyd.
Carpenter and joiner:—Murgatroyd, J. & S., Luddenden.
Plumber and glazier:—Stafford, J., Sowerby-bridge.
Slater, &c.:—Robinson, J., Luddenden Foot.

SUNNINGHILL.—For Sunninghill Schools. Messrs. Morris and Stallwood, Reading, architects. Quantities supplied:—

Kirk and Randall	£2,098 0 0
Pilgrim and Son	2,055 15 0
Norris, W. H.	1,963 0 0
Reavell, G.	1,911 16 0
Jones and Co.	1,907 0 0
Strong Bros.	1,903 10 0
Kingerlee	1,893 0 0
Woodbridge	1,879 0 0
Bottrill	1,858 14 0
Foreman	1,851 0 0
Partlo	1,851 0 0
Williams	1,805 0 0
Reavell, W. P.	1,795 0 0
Pither	1,789 9 9
Simonds	1,773 0 0
Watson, Ascot	1,685 10 0

THORNTON HEATH.—For five houses on Norbury Manor estate, Thornton Heath End:—

Howe and White	£2,120 0 0
Mattock Bros.	1,849 0 0
Syme and Duncan	1,776 0 0
Niblett	1,760 0 0
Peacock Bros.	1,530 0 0
Allen and Hurden (accepted) ...	1,500 0 0

UPPER TOOTING.—For road-making and sewerage work on the Pack Hill Rise estate, Upper Tooting, for the London and Suburban Land Co. Mr. Gritten, surveyor. Quantities supplied by Mr. A. M. Greig:—

Rigby	£2,760 0 0
Neal	2,559 0 0
Jackson	2,350 0 0
Aldred	2,290 0 0
Ford and Co. (accepted)	2,175 0 0

WANTAGE, BERKS.—For reseating the Wesleyan chapel:—

Wheeler, J., Wantage (accepted).

WESTMINSTER.—For alterations at the Lord Clyde, Rochester-row, S.W., for Mr. Wake. Mr. H. I. Newton, 27, Great George-street, Westminster, architect. Quantities supplied:—

Vears and Co.	£952 0 0
Richards	929 0 0
Pickersgill	839 0 0
Gill	727 0 0
Beale	712 0 0
Walker	689 0 0
Stiling (accepted)	570 0 0

WESTMINSTER.—For alterations and redecorations to the Royal Standard public-house and music hall, Victoria-street, S.W., for Mr. Wake. Mr. H. I. Newton, 27, Great George-street, Westminster, architect:—

Burman	£697 0 0
Creaton	553 0 0
Richards	550 0 0
Vears and Co.	447 0 0
Godden (accepted)	387 0 0
Howlett	350 0 0

WESTMINSTER.—For rebuilding No 42, Tufton-street, Westminster. Messrs. Isaacs and Florence, architects. Quantities supplied by Mr. L. C. Riddett:—

Bamford	£1,220 0 0
Scrivener and Co.	1,048 0 0
Tyerman	1,037 0 0
Boyce	1,008 0 0
Wire	994 0 0
Stimpson and Co. (accepted) ...	977 0 0

WESTMINSTER.—For rebuilding the premises, Nos. 20 and 21, Villiers-street, Strand, for Messrs. Corazza Gatti. Mr. A. J. Bolton, architect:—

Heath	£5,036 0 0
Williams, G. S. S. and Son ...	4,9 0 0 0
Laing and Son	4,885 0 0
Marks	4,880 0 0
Clemence, J.	4,595 0 0
Gaisford, G.	4,456 0 0
Hook and Oldrey	4,227 0 0

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UNIVERSITY COLLEGE, LONDON. The PROFESSORSHIP of ARCHITECTURE will be VACANT at the close of the Session. Applications for the appointment will be received on or before JUNE 20th.
TALFOURD ELY, M.A., Secretary.

GLASS TRADE.—The Worshipful Company of Glass Sellers of London OFFER PRIZES for practical ESSAYS on the past and present position of the Glass Trade.—Full particulars and list of prizes can be obtained of the Clerk, Capt R. H. EVANS, 8, Gracechurch street, E.C.

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A GERMAN ARCHITECT, practical, 13 years' experience, well up in construction, detail, &c. desires ANY ENGAGEMENT. Good references.—Address, by letter, NIEWELS, Essen Rhinprussia, Roland-st. 3.

ASSISTANT (Architect and Surveyor's) DISENGAGED; 14 years' experience. Details, Quantities, Surveying, Superintendence of works.—J., 146, Belgravegate, Leicester.

ASSISTANT (Architect and Surveyor's General) wants RE-ENGAGEMENT at once. Thoroughly experienced. Quantities, Measuring up, Superintendence, &c.—ALPHA, 39, Market-place, Leicester.

ASSISTANT (Architect's), desires a RE-ENGAGEMENT. Working and detail drawings, surveying, perspective, &c. Excellent references. Terms £2 5s. per week.—X., Newsagents, 52A, Southgate road, N.

ASSISTANT (Engineer, Architect, and Surveyor's) desires RE-ENGAGEMENT; 7 years' practical experience. Age 25. Good surveyor, leveller, and draughtsman; references.—B., 9, Thorsby-street, Sneaton, Nottingham.

ASSISTANT (Architect and Surveyor's) desires an ENGAGEMENT in a London office. Excellent references given. Salary secondary consideration.—Address, S., Brown's Advertising Office, 4, Little George-street, Westminster Abbey.

ENGAGEMENT REQUIRED AS Junior Assistant or Improver. Just completed articles. Salary not so much an object as improvement.—F. W. S., Burlton Lodge, Barnes, S.W.

IMPROVER (Architect and Surveyor's). A young man, aged 20, desires a SITUATION in a good office; 6 years' experience; first-class reference.—M. WEBB, 23, Grantley-street, Grantham.

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NO SALARY.—TO ARCHITECTS. —A Clergyman's son, good draughtsman; four years' experience. General and working drawings, perspective, surveying. Would give services for board and residence with employer. Highest references.—SPERO, Messrs. Farrant and Frost, Stationers, Merthyr Tydvil.

WANTED, by an Architect and Surveyor in the Country, a Competent ASSISTANT. State fully qualifications, references, and terms, to ARCHITECT, "The Times" Inquiry Office, Blackfriars, E.C.

APPRENTICE, BUILDER'S — A youth of 17 desires a SITUATION as Indoor Apprentice in the country. Premium to be moderate.—THOS. RUSSELL, 48, Essex-street, Strand, W.C.

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BELLHANGER, Crank and Electric, Gas and speaking-tube fitter (practical). JOB WANTED carcase preferred; 8½d. or piece; own tools.—A. P., 11, Claystreet, W.

BRICKLAYERS (good) WANTED. 9d. per hour to skilled hands.—Apply to MANAGER, at Neasden Contract Works, Metropolitan Railway, St. John's-wood Extension.

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BRICKLAYER (good jobbing) Wants EMPLOYMENT; constancy preferred; first-rate references.—JONES, 70, Kirkwood-road, Nunhead.

BUILDER'S CLERK and TIME-KEEPER. Must be well up in Bookkeeping and Office Work, and make himself generally useful.—State age, reference, and salary required to G. W., Victoria Wharf, Warton-road, Stratford, E.

CARPENTER'S ASSISTANT or IMPROVER.—WANTED, a SITUATION; have got tools.—T. S. J., 4, William-street, Manchester-square.

CARPENTER and JOINER WANTS EMPLOYMENT; good mechanic.—Address, T. B., 14, Great Suffolk street, Borough.

CARPENTER and JOINER.—Young Man WANTS JOB; wages moderate.—C. S., 6, Barnham-street, Tooley-street, S.E.

CLERK OF WORKS WANTED, to Superintend Erection of Hull Borough Asylum.—Apply, by letter, to SMITH and BRODRICK, Architects, Cogan Chambers, Hull, before noon JUNE 6th, stating salary required, age, and previous engagements.

ENCAUSTIC and PLAIN TILE FIXING WANTED. Town or country. Day or piece. Good reference.—WILLIAM EDDEN, 63, East-street, Manchester-square, W.

FOREMAN, PAINTERS & DECORATORS, WANTS RE-ENGAGEMENT. Used to first-class work; sober and industrious. Aged 38; unexceptionable references given.—A. B., 29, Oakley-crescent, Chelsea, S.W.

GAS, Bells, Hot-water Stoves.— SITUATION WANTED; experienced; references.—H. B., 30, Tufton-street, Westminster.

GAS, Bells, Hot-water, and General Hand.—SITUATION WANTED.—W. R., 10, Leighton-road, Kentish Town, N.W.

GAS FITTERS, &c.—SITUATION WANTED by Youth, age 18; well up in jobbing.—23, Circus-street, Marylebone-road.

GAS, Bells, Locks, &c.—WANTED by a Young Man, age 20, EMPLOYMENT in the above branches.—Address, IRONMONGER, Bridge-street, Newbury.

GAS FITTER, Dipper, Burnisher and Lacquerer, and General Jobbing Hand.—SITUATION WANTED by a Young Man.—Address, J. CARTER, 38, Aldred-road, Kennington Park.

IMPROVER (22), just completed his articles, desires a BERTH in a London Architect's office. Salary secondary object.—JOHN, care of Mr. Taylor, South View, Alsager, Stoke-on-Trent.

PAPERHANGER (first-class) WANTS RE-ENGAGEMENT. Willing to fill up time in decorations. Good references given. Town or country.—W. G., 6, Read's-place, Manor-street, Chelsea.

PAPERHANGER (Good) SEEKS WORK; b-st preferred.—Address, letter only, J. D., 162, Wellington-buildings, S.W.

PAINTING, DISTEMPERING, &c., WANTED by Job; terms moderate; estimates free.—GARRATT, 53, Broad-street, Bloomsbury.

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PUPIL.—To Parents and Guardians.— A Borough Surveyor has a VACANCY for an Articled PUPIL. Premium required.—Address, GEO. J. C. BROOM, C.E., Town Hall, Dudley.

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STAIRS and HANDRAILS WANTED, by First-class Hand.—Address, B. F., 56, Finsbury-pavement, E.C.

WANTED, an ENGAGEMENT as Clerk to a Builder. Country preferred. Plans, specifications, and estimates prepared. Thoroughly versed in the building line generally. Terms moderate.—DUFF, Box No. 9, office BUILDING NEWS.

WANTED, a WORKING FOREMAN of Bricklayers for a church restoration job near London. One used to Kentish Rag setting preferred.—Apply, with references and wages required, to S. C. PARMENTER, Contractor, Braintree.

WANTED, RE-ENGAGEMENT as General Foreman, or Foreman of Bricklayers; well up in constructions. Sober and trustworthy; town or country; age 36; references and testimonials.—B. T., New-buildings, Cranleigh, Surrey.

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CONTRACTS.

WAR DEPARTMENT CONTRACT.

NOTICE TO BUILDERS.

TENDERS are required for CARRYING OUT certain ALTERATIONS at the Ordnance Field Depot, Aldershot, to provide Storage accommodation for small arms, harness, blankets, &c.

Parties desirous of Tendering for this work must leave their names at this office on any day up to and including the 11th JUNE, 1881, between the hours of 10 a.m. and 3 p.m., and pay the sum of 10s. 6d. for the Bills of Quantities.

The Secretary of State for War does not bind himself to accept the lowest or any of the Tenders.

W. B. GOSSET.
Colonel Commanding Royal Engineer Camp.
Commanding Royal Engineer's Office, Aldershot Camp.
18th May, 1881.

WAR DEPARTMENT CONTRACT.

NOTICE TO BUILDERS.

TENDERS are required for ERECTING a CATTLE SHED at the South Camp, Aldershot.

Parties desirous of Tendering for this work must leave their names at this office on any day up to and including the 11th JUNE, 1881, between the hours of 10 a.m. and 3 p.m., and pay the sum of 10s. 6d. for the Bills of Quantities.

The Secretary of State for War does not bind himself to accept the lowest or any of the Tenders.

W. B. GOSSET.
Colonel Commanding Royal Engineer Camp.
Commanding Royal Engineer's Office, Aldershot Camp.
18th May, 1881.

WAR DEPARTMENT CONTRACT.

NOTICE TO BUILDERS.

TENDERS are required for PAINTING EXTERNALLY and INTERNALLY certain Buildings, and Works in connection therewith, at the Royal Victoria Hospital at Netley, in the Gosport District.

Persons desiring to Tender for the execution of these Works must leave their names at the Royal Engineer Office, Gosport, on or before the 7th day of JUNE next, and pay the sum of ten shillings and sixpence for the Bills of Quantities, which, with Form of Tender, will be forwarded to each candidate so soon as prepared by the Government Surveyor.

The Secretary of State for War does not bind himself to accept the lowest or any Tender.

C. E. WEBBER, Lieutenant-Colonel,
Commanding Royal Engineer.
Royal Engineer Office, Gosport, 25th May, 1881

WAR DEPARTMENT CONTRACT.

NOTICE TO BUILDERS.

TENDERS are required for BUILDING RETAINING WALLS and FORMATION of EARTHWORKS for Covering Mass to Main Magazine, and Works in connection therewith at Fort Staddon, in the Plymouth Sub-District.

Persons desiring to Tender for the execution of these works must leave their names at the Royal Engineer Office, Devonport, on or before the 11th day of JUNE, 1881, and pay the sum of 10s. 6d. for the Bills of Quantities, which, with Form of Tender, will be issued to each candidate.

The Secretary of State for War does not bind himself to accept the lowest or any Tender.

R. GRANT, Lieut.-Colonel
Commanding Royal Engineer, Plymouth Sub-District.
Royal Engineer Office, Devonport, May 30, 1881.

COAST GUARD CONTRACT.

TO BUILDERS AND CONTRACTORS.

TENDERS for the ERECTION of a NEW STATION for the Coast Guard at Dunbar, in the County of Haddington, N.B., consisting of Officer's House, four Cottages, Store House, and other buildings, will be received at this Office at noon on FRIDAY, the 10th June, 1881.

The Drawings and Specification may be seen at this Office, and at the Watch-room, Coast Guard Station, Dunbar.

Bills of Quantities may be obtained on application to this office.

Director of Works Department, Admiralty, 71, Spring gardens, London, S.W., 18th May, 1881.

COAST GUARD CONTRACT.

TO BUILDERS AND CONTRACTORS.

TENDERS for the ERECTION of a NEW STATION for the Coast Guard at Caister, in the County of Norfolk, consisting of Officer's House, five Cottages, Store House, and other buildings, will be received at this Office at noon on FRIDAY, the 10th June, 1881.

The Drawings and Specifications may be seen at this Office, and at the Watch-room, Coast Guard Station, Caister.

Bills of Quantities may be obtained on application to this office.

Director of Works Department, Admiralty, 71, Spring-gardens, London, S.W., 18th May, 1881.

TO CONTRACTORS.

The Town Council of the City of Chester are prepared to receive TENDERS for the ERECTION of the PROPOSED MARKET EXTENSION BUILDINGS, and ALTERATIONS to present Public Market, Northgate-street, Chester.

Plans and Specifications may be seen at the office of the undersigned on and after Tuesday, June 7th, between the hours of 9 a.m. and 6 p.m.

Bills of Quantities may also be obtained on deposit of One Guinea, which will be returned on receipt of bona fide Tender.

Sealed and properly endorsed Tenders are to be delivered at the Town Hall, by Ten o'clock in the forenoon of MONDAY, the 20th of June, 1881.

The Town Council do not bind themselves to accept the lowest or any of the Tenders.

MATTHEWS JONES, City Surveyor.
Town Hall, Chester, May 25th, 1881.

TO CARPENTERS.

The Commissioners of Her Majesty's Works and Public Buildings are prepared to receive TENDERS for the PERFORMANCE of the CARPENTER'S WORK in the Royal Palaces and Buildings in the Kew and Richmond District for a period of three years, from the 1st of July next.

Persons desirous of Tendering must apply to H.M. Office of Works, No. 12, Whitehall-place, for Schedules of Prices on which to base their Tenders.

The sum of two shillings and sixpence will be charged for each Schedule.

The Tenders are to be delivered at this Office before 12 o'clock on MONDAY, the 13th day of June next, addressed to the Secretary, H.M. Office of Works and Public Buildings, and must be endorsed "Tender for Carpenter's Work, Kew and Richmond District."

The Commissioners do not bind themselves to accept the lowest or any Tender.

A. B. MITFORD, Secretary.
H.M. Office of Works, &c., 27th May, 1881.

MIDLAND RAILWAY.

(SOUTHERN DIVISION.)
TO BUILDERS AND OTHERS.

The Directors are prepared to receive TENDERS for the ERECTION of STABLES, &c., at Moira.

Persons desirous of Tendering for these works may inspect the Drawings, Specification, and Quantities upon application at the Engineer's Offices, Derby Station, on and after the 7th inst.

Tenders to be forwarded by post to the Secretary of the Way and Works Committee, Midland Railway, Derby, not later than 9 a.m. on TUESDAY, the 14th inst.

The Directors do not bind themselves to accept the lowest or any Tender, nor to pay any expense connected with any of same.

JAMES WILLIAMS, Secretary.
Derby, June 1st, 1881.

TO BUILDERS.

Any person desirous of giving an ESTIMATE for Building a Residence on the Bossington Estate, Linslade, Bucks, for Mr. King, is requested to make an early application for Bill of Quantities.

No pledge is given to accept the lowest or any Tender.

J. T. LAWRENCE, Architect
Leighton Buzzard, May 25th, 1881.

THE BUILDING NEWS.

LONDON, FRIDAY, JUNE 10, 1881.

REPAIRS.

ONE of the minor duties of the architect, indeed one more generally performed by the surveyor, is that of examining the state of repair of premises for the purpose of assessing dilapidations. Dwelling-houses are seldom built now to last out a long lease, and the importance of an examination of premises before signing a lease cannot be too forcibly pointed out to those who contemplate becoming tenants. The duty of surveying dilapidations supposes a more than ordinary knowledge of the construction of covenants and conditions, as these are usually framed in leases or agreements, and further, a pretty accurate notion as to what constitutes a "dilapidation." "Fair wear without accident" has been held not to be a dilapidation, and the word "accident" in this sense means a sudden deterioration as distinguished from wear which takes place gradually. Any part of a building which shows a gradual decay or wear, so long as it is efficient for its purpose, is not chargeable as a dilapidation; and it is just this point of efficiency which frequently determines the liability of a tenant. A variety of practical considerations arise from such a definition, which often baffle the surveyor in writing out his specification. Kitchen or basement floors, of wood, are constantly subject to decay from various obvious causes, and it may be easily imagined that the efficiency of the floor may be so far a question of doubt as to lead to the supposition that it is a dilapidation through the effects only of use or age. It is extremely difficult sometimes to say whether the efficiency of a piece of construction is evident, also to distinguish between parts subject to neglect and misuse, or simple wear and natural decay. Defective foundations, rotten joists and boards to underground floors, through want of ventilation; damp walls, weak or decayed stair-treads, and a variety of other things, call for very careful inspection and discernment on the part of the surveyor.

If any part becomes dangerous, or gives way, the tenant is liable for its repair, or any damage occasioned by its fall. A nosing of a step, if broken, is a dilapidation; if quite worn away, it is not one. If, by negligence to the repair of a roof, the timber decays, the damage is looked upon as a dilapidation; and the same may be the result from a neglect of painting. Dilapidations are thus *voluntary* when they imply active deterioration, and *permissive* when the deterioration arises from passive neglect. In a word, dilapidations arise when the conditions of the premises are in a worse state than they ought to be, reasonable wear excepted; and this general distinction may be usefully kept in view, however much it may be altered by circumstances. Unfortunately, the law leans against lessees in the interpretation of repairing covenants, and the tenant is often called upon to place in a better condition than he found the premises in. What makes the matter worse is that, in the absence of a stipulation, a landlord is not legally liable to his tenant in respect of repairs, though the latter is still compelled to pay rent, even though the premises are quite unfit for habitation, or have fallen down. It is lamentable to think of the position of many tenants, who have probably taken long leases of houses without a careful supervision being made of their condition as regards drainage and repairs. They find out some inherent defect, and call upon the landlord to remedy it, without thinking, in the absence of stipulation, there is no implied promise by law on the part of the landlord. The best authority on the Law of Landlord and Tenant distinctly says: "There is never any covenant or promise implied by law on the part of the lessor of a house or land that it is reasonably fit for habitation; nor that the house will endure during the term, nor that the lessor will do any repairs whatever." Nothing is clearer. If a house is in a dangerous state, if the roof leaks, the landlord cannot be called upon legally to repair. Hence the importance of tenants making proper stipulations in their agreements. The tenant's liability, on the other hand, is always to repair, maintain, and uphold the premises, even though there may be no covenant to that effect. These duties on the part of tenant are implied, and are as binding as if they had been expressed. The tendency of recent decisions, and the opinion of the best authorities, appear to show very clearly that a tenant for a term of years is liable for permissive waste, and, of course, we are referring only to tenants in such a position.

It becomes, therefore, a very plain duty of tenants to exempt themselves from unnecessary liabilities, which the law supposes they are in a position to do. The performance of this duty of course rests with the surveyor, who may be called in by the incoming tenant to examine the state of repair, though houses are taken every day in very doubtful conditions, without such examination. A minute survey of the house and premises is necessary, and a schedule of the repairs required should be prepared before the lease is executed. This schedule ought to be signed by both the lessor and lessee, and it then becomes evidence of admission on the part of the landlord as to the state of repairs. It also becomes a valuable record in assessing dilapidations afterwards. In making out the schedule or specification, structural defects and drainage ought particularly to be noticed, and it would facilitate the labour of preparation if some method were always adhered to. Defective walls, floors, roofs, skylights, gutters, sunk and broken paving, sashes, cisterns, and water supply, defects in plastering, broken or cracked glass, worn or soiled paintwork, defective ironmongery, and fastenings, are some of the essential points to look to. It is desirable for surveys to be made during the term in all cases; but generally, although there is a covenant to enter and view state of premises, landlords seldom enforce the rule. A three months' notice is usually given for repairs, after the survey which ought to be made towards the expiration of a lease. As a general principle in assessing dilapidations, a tenant cannot be called upon to deliver up the premises as new, only to leave them in a condition they ought to be in after a reasonable wear has been considered. The tenant may reasonably have the option of executing the required repairs, or of paying the sum assessed by the surveyor; but it has been decided that a tenant is not bound to use new materials. At the end of long leases decay and wear of materials may be considerable, and ought to be fairly allowed in assessing the value.

As there is a very vague impression existing about the extent of the obligation of the tenant to repair where an express covenant exists, it may be as well to say that in most leases the tenant enters into a general covenant to repair and keep in repair the demised premises, and also covenants to repair certain defects within three months' notice; to paint inside and out at stated intervals. These are construed with reference to the age, nature, and general state of repair of the premises at the time of the tenant's entry. So that a tenant taking the lease of an old house would not in ordinary cases be required to yield it up at the end of the term in a better condition than he found it on entering. But "to keep and yield up the premises in *good* repair" is a clause of greater binding power, and requires the tenant to place the premises in such a state even if he found them in a bad state of repair. The words "keep the premises in habitable repair," imply often that they are to be put in a better state of repair than they were found in, and a covenant to "substantially repair, uphold, and maintain," makes the tenant liable to paint the inside in the usual manner. General covenants to repair, of course, extend to all buildings erected on the demised premises, as well as to landlord's fixtures; but a tenant cannot be compelled to pay for a new floor or window, but only for repairs to them. But these distinctions are sometimes so fine that the surveyor's judgment and experience are required to determine them. Sometimes there is a covenant by the lessee to the effect that he will "well and sufficiently repair, maintain, cleanse, paint, and keep present and future erections, with all needful reparations and amendments whatsoever, shall paint outside once in three or five years, and inside once in five or seven years, &c." The Institute Report, speaking of such a covenant, shows that if the effects of use or age have proceeded so far as to destroy the efficiency of any part, this argues neglect or misuse, and consequently the tenant is liable; and the lessee is bound to maintain the efficiency of every part of the premises, either by simple repair or by renewing the part altogether.

THE FRENCH INTERNATIONAL CONGRESS OF 1878.

THEY do not always manage these things better in France, if we may judge from the fact that the publication of the shorthand notes of the reporters, and of the papers read at the meetings of the Congress, have only just appeared, two years and nine months since it took place. Such an unreasonable delay has necessarily deprived the volume just issued of a great portion of that interest with which it would have been invested, had it made its appearance when the topics introduced were still uppermost in our minds. Could it have appeared even before the late Conference, it would have been interesting to compare notes with the system of competitions abroad, the regulations regarding schedules of prices, and the history of compulsory examinations for architects in foreign countries. The Congress was held, it may be remembered, during the Great Exhibition of 1878, between the 29th of July and the 3rd of August. Most of the meetings were held in the Trocadero, and some of the sections in various disused offices in the Louvre buildings. The nominal President (President d' honneur), was M. Lesueur, the architect of the "Salle des Fêtes," in the Hotel de Ville (destroyed by the Commune in 1871), the acting President was Monsieur Lefuel, the architect of the Louvre, since deceased. In April, 1879, Mr. R. Phené Spiers, who was appointed delegate by the Architectural Association, read a paper on the Congress, giving a general description of all that took place. This description took note of the various meetings held, and gave a summary of the papers which were delivered at the general meetings. Of the work done by the various sections, however, Mr. Spiers was unable to say much, first, because the sections met simultaneously in different rooms, and, secondly, because most of the communications were of such length that they had to be taken as read; in some cases they were in foreign languages, and had, therefore to be translated first.

The subjects treated by the sections in detail were :—1. Organisation of Workmen and their Apprentices. 2. Professional Scale of Charges (*honoraires des architectes*), and 3. Public Competitions. The subject of Architectural Education was touched upon, but no result arrived at. Beyond the papers and discussions on these three subjects, and those already referred to by Mr. Spiers, the report just published contains notes on the construction of Protestant churches in Sweden, illustrated by plans ; a paper on the question of Restoration of the Cathedral at Rheims ; an historical account of the construction of the Abbey Church of St. Remi, at Rheims (these two latter papers having been obliged to be taken as read, when the Congress visited Rheims) ; a description, by M. le Commandant de Silva, architect at Lisbon, of five of the principal churches of Portugal, illustrated by plans in which special notice is made of the resemblance between the church at Batalha and some of our English Cathedrals, the design of the former having been ascribed to Stephen Stephenson, an English architect ; and a notice of some French monuments: communications probably made to the Congress, which are, therefore, printed in the report, though without any special application to its work. Of these several subjects, those treated in the three sections only require special notice here—viz. : 1. Organisation of Workmen and their Apprentices. 2. Scale of Charges, and 3. Competitions.

The organisation of working men and their apprentices has long been a favourite subject with the *Société Centrale des Architectes*, the society responding to our Institute of British Architects, and under whose auspices the Congress of 1878 was held. A commission of fifteen members (of whom the late M. Baltard was the President) drew up a report on the same which was adopted by a general assembly of architects in 1872 ; and a copy of the report is published with the Proceedings of the Congress, p. 195. It would occupy too much space to do more than refer to the resolutions which were passed. They proposed that boys, on leaving the primary schools, should be placed with or apprenticed to employers who would undertake to allow them to devote part of their time to special studies of drawing and mathematics in schools to be provided for that purpose ; the schools to be formed on the same basis as those existing at Chalons, Aix, Angers, and in the Rue de l'Ecole de Médecine ; that a jury or school-board should be formed of architects, engineers, contractors, and foremen of works, to establish examinations and to give diplomas ; and that, in the provinces and the small towns, a member of the Société Centrale should be appointed to perform the same duty. Nothing seems to have been said about the cost of forming such schools or school-boards, possibly because at that time, in the early days of the Republic, it was difficult to see how the question could be taken up.

The first communication made before the congress of 1878 was by M. Charles Lucas, who, as the secretary of the Société Centrale, has been for many years an active agent in promoting the establishment (consequent on the report above-mentioned) of schools for the working classes, including primary and technical education. M. Lucas read an account of his experience, from which it would seem that, not only in Paris, but throughout France, there do exist now many more schools than in 1872 for apprentices, and clubs (*cercles*) for working masons. These schools are supported partly by fees, partly by the municipalities, and partly by the State ; and it was M. Viollet le Duc's opinion that the principal contractors ought, in some measure, to aid in their maintenance, seeing that they derive considerable benefit from the improved education of apprentices. M. Lucas terminated his paper with a description of a municipal school for apprentices erected by him at La Villette. Four other communications were made, of two of which a *résumé* only is given. M. Douillard proposed to unite in professional corporations or guilds the employers and workmen of the different trades, and in which there should be four classes : 1st, all the contractors whose names are inscribed in the directory ; 2nd, all the foremen ; 3rd, all the workmen ; and 4th, all the apprentices. All the members of the guild are admissible to the first class, provided they can pass the examination necessary for so doing. What examination would be required to pass from the 2nd into the 1st class is not specified, but to become a foreman the ordinary workman, to prove his practical knowledge, must submit a remarkable work which will be his *chef d'œuvre*. The *chefs d'œuvre* of the guild would be exhibited annually, and every five years, the *chefs d'œuvre* of all the world. Amongst other duties this guild is to endeavour to draw up (assisted if necessary by architectural arbitrators) a schedule of prices, in other words, a Laxton's Price-book, to be in force for the current year only. Money should be put aside out of the subscriptions to provide for those who are ill or out of work, and possibly for the speculative purchase of ground and the erection of houses thereon (*sic*). M. Duvert's communication was of a somewhat similar nature. Employers and workmen were to pass examinations, be classed according to their merit, and their wages fixed therefrom. Any member of the guild guilty of immorality to be expelled ; and finally, for Sundays and winter evenings, libraries, rooms, and halls were to be provided with games or other distractions, in which the wives and children could take part, in order to give the working man the only pleasure he can enjoy, that of remaining in the bosom of his family. The two other communications of M. Lehman and M. Goffinon are much more practical, in that their propositions are based on that which exists. M. Goffinon divides his education for working men and apprentices into two sections, theory and practice ; the former to be taught in Government and provincial schools aided by the volunteer assistance of various architects and engineers. The practical part to be acquired on the works of the principal contractors of Paris, or in the provinces working under some contract with the Société Centrale des Architectes. M. Goffinon terminated his paper by pointing out that as all the duties of life require from time to time some stimulant, so the professors would look forward to the ribbon of the Chevalier de la Legion d'Honneur, the contractors to medals, and the working men to diplomas. In order to explain what to many might seem an extraordinary state of things to admit of the possibility of such propositions, it should be stated that in Paris and France generally, buildings are carried out not by one general contractor, but by a series of contractors, all keeping to their own particular trade, and it is invariably the case that these contractors have risen from the bench. The examination of the different classes and the possibility of a working mason becoming first a foreman and eventually a contractor in his own special trade is only a natural occurrence, and French architects cannot understand how we in England are content to have one contractor, who, they say, can have but a very general smattering of each trade. We, on the other hand, consider that an architect's work would be materially increased by having to do with more than one contractor, and the endless disputes to which it would seem to give rise in the event of a mistake being made (for instance, in one of the trades which necessitated additional labour and expense in another), would seem at first to be unfathomable. Such disputes are, of course, always arising, and the system has called for the establishment of a special class of professional men, who are called architects' experts. They respond, in some sense, to our measuring surveyors ; their work, however, commencing at the end of a job instead of at the beginning, and they are appointed, we believe, very much in the name way as the arbitrators provided for in our English contracts, except that there are few cases in which they are not called in to assist in the settling of accounts.

(*To be continued.*)

PLUMBER'S WORK—SANITARY AND OTHERWISE.

SOME fresh interest has been recently awakened with regard to the plumber s share in sanitary house-building, and the course of lectures being delivered by Mr. Stevens Hellyer under the auspices of the National Health Society, will aid, more or less, to bring about reform. The old schools of plumbing have turned out very efficient workmen, and in some branches, as those concerned with lead-laying, we possess no better. With regard to sanitary plumbing, however, considerable changes have been introduced. What was deemed correct plumbing, in such matters as connections and soil-pipes, has been completely set aside of late years, and many cherished ideas as to air-tight drains and traps have been exploded. One word as to the title of "sanitary engineer." We can see no harm in a plumber who has mastered the sanitary branch of his business, distinguishing himself with this title, as both by his practical plumbing knowledge and his experience in sanitary work, he is as much entitled to the distinction as a "mechanical engineer" who has really been practically trained in a workshop in the details of machinery.

Mr. Hellyer's remarks on joints and pipe bending—a full report of which we published in our last issue — deal with the A.B.C. of the sanitary plumber, though we are not quite prepared to endorse the assertion that some plumbers, though they make joints daily have never learned how to make a perfect joint. There is a philosophy in pipe-jointing, as in many other very simple operations, which the practical plumber ought to understand. There are many little points to be observed in joining the ends of two pipes. Their relative positions ought to be, of course, the first consideration, so that any matter passing down the pipe may not lodge on the edge of the lower one, and this is insured by introducing the upper pipe within the lower, so as to go with the stream, and by well opening the outer pipe, and rasping off any edge or obstruction that may be formed, so that a perfect and smooth bore may be made. There should be no contraction at the joint, as there very often is. Mr. Hellyer laid necessary stress also on the "soiling" of the ends, getting a true ring for the shaving line, and preserving a proper thickness of solder round the joint—little matters too frequently unheeded by the workman, but which a knowledge of first principles would suggest. The virtues of particular joints are lauded by some plumbers, and as doctors differ, so are their various opinions on the advantages of different kinds of joints. A good "wiped" joint is, no doubt, quite equal to an "over-cast" joint, or one where the joint has afterwards been ribbed by a hot iron. We are not prepared to agree with Mr. Hellyer that a joint of half the length of that made in England is not equally strong, and we believe the Scotch plumbers are able to make joints which can compare with any made in this country.

The directions given by the lecturer in the making of "underhand joints," are not always followed, especially in small pipes, and we have often seen the manipulation to large pipes performed in a rather slovenly manner.

The lecturer justly condemned the old manner of connecting branch with main pipes by a mitre-joint, which, besides wasting solder, produced a weak and imperfect joint, contrary to correct principles. A great notch had, of course, to be cut out of one pipe and afterwards filled up with the corresponding projection left on the end of the other, and the soldering became both troublesome and wasteful, as it had to follow the curvilinear line of the intersecting pipes. The other plan shown on the diagram was superior. The remarks made on bending pipes, and the diagrams showing old and incorrect principles were, perhaps, of as much importance as those on jointing. In many of the houses built now, we find the old methods resorted to, and the abominable "elbow joint" is constantly met with. Every tyro in mechanics knows the effect of bending a tube, that it buckles in on the top side, bulges at the sides, and weakens or cracks at the heel of the bend. The result is, of course, to contract the tube at the bend, as shown by the diagram Mr. Hellyer exhibited. All these defects have to be avoided by skilful manipulation after heating the pipe at the bend, and by the use of the dresser and dummy to restore the weakened parts by beating down the sides, raising the neck, and dressing the heel, so as to make it resume the original thickness. In short, the practical plumber, by exactly knowing the effect of bending a tube, and the mechanical displacement of the metal it causes, endeavours to restore the metal to its original thickness, and preserve the rotundity of the pipe and its full bore at the bend. This, of course, is the principal art in pipe-bending, and "bobbins" are only makeshifts. As jointing and bending are at the threshold of sanitary plumbing, it is of the utmost use that the workman should master these requirements, and we are glad to find the proposal made to award money and book prizes for the best specimens of bent lead pipe, wiped soldered joints, and bossed-up lead breaks, produced by journeymen, who shall in addition furnish rough sketches showing the best way of disconnecting soil-pipes and waste pipes from drains, and of ventilating such pipes to prevent siphonage. It is satisfactory to find that the subjects of house-drainage and ventilation are to be made the topics of the later lectures, for it is with regard to these matters that we find so much prejudice and ignorance. How many plumbers there are who still cling to the old method of fixing closets and waste-pipes, and it is astonishing to find the D-trap largely patronised by the craft, in spite of its imperfections. The principles of modern sanitation will have done very little till the plumber is able to realise the defects of the old plans and, for his own credit, sees that such principles are carried out. Of what use is it for the architect to specify an approved system unless the plumber fully enters into the matter? At present, the plumber sometimes seems callously indifferent; he sees no advantage in adopting a system of house-drainage which has received the sanction of scientific men and more enlightened plumbers, and is blind to the difference between traps which are collectors of deposits and those which are not, and to the value of disconnection of soil- and waste-pipes from the drains. When overflow pipes from cisterns are joined to the water-closet drain, or are laid to the trap of siphon, and air and waste-pipes are made to connect the closet with the cistern for drinking-water; when the wastes from sinks and lavatories are laid on to the drains or soil-pipes with mere bends or traps as checks to the escape of gas, surely the charges made against him are not exaggerated. The old plumbers were taught to believe in the perfectibility of the trap, that nothing could escape it, and upon this conviction, they have opposed all improvements. The experience and science of the last 40 years have demonstrated the fallacy of closed, trapped drains, and have shown that if we want immunity from zymotic diseases, we must make our traps ventilators as well, place them outside our houses, or carry up the soil-pipes as open ventilators to our drains. The numerous inventions which have been patented of late years in improved traps alone, indicate the greatness of the revolution in sanitary matters, and the urgency there is for a remodelling of the instruction given to plumbers. It is one of the trades connected with building which needs a liberal knowledge of the principles of physical science, and we believe the only way of insuring the necessary amount of theoretical and practical knowledge, is by the establishment of some kind of Government inspection, and granting certificates to qualified plumbers. There are, already, one or two trustworthy books and treatises written by plumbers of late years, which attest a desire to raise the art to a condition equal to the sanitary knowledge and demands made upon it, and we believe the trade is fully alive to the importance and necessity of reform.

HYDRAULIC MORTARS.*

By DR. MICHAËLIS, of Berlin.

IF we admit the hypothesis of the formation of a hydro-silicate of lime, ignoring all accessory processes, we may thereby explain the nature of hydraulic induration. We do not intend to enter here into a full description of the hydro-silicate of lime and its properties, but shall merely examine two of its more salient features.

The calcic hydro-silicate which is found in all hydraulic limes, Puzzolana mortars, and Portland cements, can exist only under water or in a medium saturated with moisture; if exposed to the air, it loses, at ordinary temperatures, water of hydration, and its composition is thereby destroyed. If our hypothesis, that hydraulic induration is mainly owing to the formation of a hydro-silicate of lime, be correct, the above-mentioned property of this silicate will be observable in all hydraulic substances, including Portland cement. It has long been known, with respect to the "Santorin earth," that the mortar produced with this puzzolana (which is chiefly composed of pumice—volcanic lava), loses, in contact with the air, the cohesion it has attained under water. For some years, we have prosecuted investigations in this direction with regard to all kinds of hydraulic substances, and have conclusively established the fact that no cement can retain uninjured its cohesion, otherwise than by being kept in a damp medium.

It is obvious that this fact will be most apparent in the case of pure hydraulic mortars unmixed with sand or other aggregates. Every one will recollect having observed pure or rich hydraulic mortars which showed signs of incipient disintegration, in the form of hair-like cracks.

A second property of this hydro-silicate of lime is its behaviour in every respect like a colloid. Its nature is similar to that of the hydrates of silica, alumina, magnesia, and lime (existing in quick-lime). It presents the appearance of a swollen gelatinous body, with no tendency to crystallisation; at least, in no case in which we have examined this silicate, have we been able to prove conclusively the presence of crystals. The hydro-silicate behaves like a mineral-glue, and possesses all the cementitious properties of its constituents; during the process of desiccation, it becomes gradually more compact, and shows, up to a certain point, a constant progression in cohesive strength; finally, it surrenders its water of hydration, when the disintegration commences.

The less compact the hydraulic mortar, the more rapidly will this disintegration take place; the denser it is, the more capable will it show itself of withstanding it. Thus the pure hydro-silicate of lime is destroyed with rapidity; Santorin earth and Puzzolana mortars, within a short period; hydraulic lime and Roman cement more slowly; while, last of all to succumb, is Portland cement. Even this excellent material, if used neat or in large proportions and exposed to the air, cannot last out a single summer: after this period in our own climate (and this is much more notably the case in warmer countries), it is found to be covered with a network of innumerable capillary cracks, which hitherto have been generally taken as a proof of imperfect manufacture or careless workmanship, and as being a sign, though an insignificant one, of a tendency to "blow." They are, however, in every case the natural and inevitable results of desiccation, and betoken the commencement of disintegration.

The above remarks will be sufficient to furnish our readers with the key to many hitherto unexplained phenomena; in order, however, to afford to every one an opportunity of forming his own judgment in the matter, we shall adduce from our investigations a few experiments which have a more especial bearing on the subject before us.

A sample of Portland cement (Wallsend brand) had lain for five years immersed in water, and during that period had given the following results (every number being the mean of at least ten breakings).*

Age 1	day,	223·73lb. per square inch.
,, 2	,,	345·05lb. ,,
,, 3	,,	411·75lb. ,,
,, 4	,,	496·67lb. ,,
,, 5	,,	465·52lb. ,,
,, 6	,,	509·62lb. ,,
,, 7	,,	482·45lb. ,,
,, 1	month,	684·41lb. ,,
,, 3	,,	752·97lb. ,,
,, 6	,,	1002·29lb. ,,
,, 9	,,	855·94lb. ,,
,, 1	year,	1149·79lb. ,,
,, 2	,,	847·84lb. ,,
,, 3	,,	808·30lb. ,,
,, 4	,,	869·59lb. ,,
,, 5	,,	962·33lb. ,,

This cement was therefore of excellent quality; nevertheless briquettes of the same cement, which had lain under water for a period of five years, after being exposed to the air for ten weeks, at a temperature of 18° to 20°, C. (64·4 to 68°, F.), showed a strength of only 433·81b. per square inch.

The two portions of one of the strongest of the briquettes broken at 5 years (giving 1,024·11b. per square inch) were dried over chloride of calcium, whereby the following decrease in weight was found to take place:—

	Weight.	Loss of Weight.
Air dried,	203·300 grammes.	
After 1 month,	185·527 ,,	17,773 grammes.
,, 2 ,,	185·300 ,,	0·227 ,,

Thereafter one portion of the briquette (*a*) was kept for five months over chloride of calcium, and then in the desiccator over sulphuric acid; the other portion (*b*) was

* Communicated by the author.

* We are of opinion (see also "Zur Beurtheilung des Portland Cements," Polytechnische Buchhandlung. A. Seydel, Berlin, 1876) that the decrease in tensile strength after the first year is merely apparent, and that it is due to a change in the molecular structure. In course of time the structure of cement gradually approaches in appearance that of porcelain; its elasticity diminishes, but its resistance to pressure increases, or the relation between the tensile and the crushing strength becomes altered in favour of the latter, the cement becoming more brittle.

wrapped in blotting-paper, and placed aside in the laboratory.

These investigations were commenced in October, 1878; in both instances the decrease in weight was continuous, and was as follows:—

	(a)	loss.	(b)	loss.
After 3 months,	99·322	—	85·984	—
,, 4 ,,	99·128	0·194	85·990	—
,, 5 ,,	98·724	0·344	85·775	0·209
,, 6 ,,	97·945	0·829	85·703	0·072
,, 7 ,,	97·802	0·143	85·653	0·045
,, 8 ,,	97·570	0·282	85·590	0·059
,, 9 ,,	97·290	0·280	85·495	0·104
,, 10 ,,	—	—	85·353	0·142
,, 11 ,,	—	—	85·165	0·188
,, 12 ,,	95·292	1·998	84·892	0·263
,, 13 ,,	95·042	0·250	84·755	0·137
,, 14 ,,	94·463	0·579	84·260	0·495
,, 15 ,,	94·106	0·357	84·064	0·196
,, 16 ,,	93·507	0·599	84·138	—
,, 17 ,,	—	—	83·437	0·627

The loss has hitherto been constant; the same investigations are being continued.

With the excellent "Stern" cement a series of tests, to extend over a period of ten years, was commenced in January, 1876, with a view to establishing the relative strength of cement tested in a dry and wet condition. The wet briquettes were tested immediately on being taken from the water, those to be broken dry were removed from the water 14 days before testing. While testing the briquettes broken after 30 days (in February) and also those from the first to the fourth year (broken in January) the room was heated.

Age.	Broken Wet.	Broken Dry.
7 days,	777·3lb. per sq. in.	—
30 ,,	844·4lb. ,,	707·0lb. per sq. in.
90 ,,	958·9lb. ,,	902·9lb. ,,
180 ,,	912·1lb. ,,	730·9lb. ,,
1 year,	925·1lb. ,,	623·8lb. ,,
2 ,,	997·7lb. ,,	600·9lb. ,,
3 ,,	685·7lb. ,,	509·9lb. ,,
4 ,,	947·3lb. ,,	396·8lb. ,,

Among the numerous tests (over 80,000) which have been carried out in our laboratory, those made with neat cement, lime, and puzzolana mortars, which were kept exposed to the air, invariably showed at an advanced age signs of incipient disintegration more or less distinct, unless care was taken that the atmosphere in their vicinity was kept saturated with moisture.

The fracture of a cement, injured through desiccation, is so characteristic that the progress of disintegration or loss of strength may be recognised with ease. The appearance which any pure hydraulic mortar presents, if broken at a certain age, is invariably of a "shelly" character; a cement which has been injured by desiccation shows, on the contrary, a fracture of a more serrated nature.

Investigations with the object of ascertaining the degree of humidity of the atmosphere, beyond which hydraulic mortars retain their water of hydration, are at present in course of prosecution. By another series of tests we are endeavouring to establish the extent to which mixtures of hydraulic materials with sand, or other aggregates, are capable of withstanding the destructive effects of desiccation.

In analogy with the behaviour of quicklime, and in accordance with the colloidal nature of the calcic hydro-silicate, the contraction is less injurious in its effects the poorer the mortar.

We have endeavoured to show how the hydro-silicate of lime existing in hardened cement becomes, by continued separation of its water, gradually more dense, and, although in its separate particles becoming harder, is eventually destroyed through the fissures produced by contraction, which then become the cause of the total disintegration of the mass, under the changing influences of heat and cold, and more particularly of frost.

If it be true that the destruction of cement is due merely to contraction, causing interruption of continuity of the mass—in short, to those capillary fissures—it must follow that the well-known means for preventing contraction, especially the admixture of sand, will enable cement to escape these disastrous results.

It is understood that we speak here only of cements of unexceptionable quality, and their deterioration, when exposed to the action of the atmosphere. The disintegration of cement mortars kept under water in a moist condition arises from imperfections in the cement, in most cases from actual "blowing," and in such instances the fissures produced are in appearance of a totally different character.

If briquettes of neat cement and of cement and sand mixtures, which have undergone the hardening process for a considerable period immersed in water, and are perfectly intact, and have attained a high degree of strength, be exposed for a lengthened period to a process of desiccation, either in the desiccator over sulphuric acid or chloride of calcium, or in the atmosphere at a temperature between 60° and 120° C. (140° to 248° F.), in every case the neat cement will be observed eventually to be covered with fine capillary cracks. The larger the size of the briquette the more rapidly and distinctly will these cracks make themselves apparent. In the case of tensional briquettes, even in the small one-inch section fiddle or wedge-shaped pattern, considerable cracks may be observed in the direction of the long axis of the briquette. The strength is found to be affected more or less, according as these cracks take place more or less nearly at right angles to the line of tension. Even very distinct cracks, when in the direction of the strain, exert little or no influence on the tensile strength.

In many cases no sign of capillary cracks can be discovered, even on a very close external examination of such dried briquettes; the characteristic serrated fracture on breaking reveals, however, at once, the latent pressure, so to speak, of contraction.

In the case of cement and sand mixtures, the writer has not, for a long time, observed any such phenomena when the cement was of good quality, and mixed with not less than two parts of sand; even with mixtures of 1 : 1, if worked up sufficiently stiffly, cracks are very seldom apparent in small briquettes.

The larger the size of the object which is prepared from cement-mortar, and the greater the strain to which it will be subjected, the smaller should be the proportion of cement used. On this account also, it is in the highest degree requisite that cement be ground much more finely than has hitherto been customary. If, for example, a manufacturer of artificial stone employs 1 part of cement, ground to the ordinary degree of fineness, with 2 or 3 parts of sand, he might, with a more finely-ground cement, such as would pass through a sieve with 32,000 meshes per square inch and leave no residue, use 5 or 6 parts of sand; the article produced would attain the same strength after the same length of time as that prepared with a much larger proportion of coarsely-ground cement, and would, at the same time, exhibit a much better appearance and remain free from capillary cracks.

In order to study the effect of desiccation on mixtures of cement and sand, we have carried out, among others, the following series of tests, the briquettes employed being of 5 square centimetres sectional area:—

1. The same cement as that of which the strength, up to the age of four years, is given above, and which was thin, was tested neat, in the one case direct from the water, in the other, after lying 14 days exposed to the air, was made up with one, two, three, and four parts by weight of sand and tested, in the case of those under "A" immediately on being removed from the water, those under "B" being permitted to remain 28 days exposed to the atmosphere.

The mean, in each case, of 10 briquettes, furnished the following results in lbs. per square inch:—

	1 : 1		1 : 2		1 : 3		1 : 4	
Age	a	b	a	b	a	b	a	b
180 days	603·1	754·5	462·3	637·2	347·0	583·1	285·9	450·8
1 year	635·9	775·2	487·7	611·0	368·8	458·1	302·8	406·6

Thus it will be observed that in no case did a decrease in strength take place through the briquettes being dried before breaking; but, on the contrary, a considerable advance in strength, and that from causes of which I shall hereafter treat.

2. Briquettes of one part cement and one part sand which had been undergoing induration under water for a period of 3½ years, were broken as follows:—

a. Directly on removal from the water.

b. After four weeks' air-drying.

c. After 27 days' air-drying; the briquettes were then re-immersed in water: tested directly from the water.

d. After 21 days' air-drying, then seven days re-immersion in water: tested directly from the water.

e. Seven days' drying at 130° to 140° C. (266° to 284° F.).

f. Seven days' drying at 130° to 140° C. (266° to 284° F.). Then one day re-immersed in water: tested directly from the water.

g. Seven days' drying at 130° to 140° C. (266° to 284° F.). Then seven days re-immersed in water: tested directly from the water.

The following are the results, each number being the mean of ten breakings, in lbs. per square inch:—

a	*b*	*c*	*d*	*e*	*f*	*g*
411·6	672·8	484·3	480·0	588·1	428·1	374·1

It will be observed that *b* to *g* inclusive, which were subjected to a process of desiccation, have suffered no diminution in strength (the insignificant variation between *a* and *g* is such as occurs between briquettes treated identically); it is well known that a certain slight increase in strength is always occasioned by the formation of carbonate of lime; this, however, may be left entirely out of account in view of the fact that all cement, sand, mortars, as also all common bricks (capable of absorbing a considerable amount of water) porous sandstones, &c., present, in the dry state, greater resistance to the separation of their molecules.

The series of tests, *c*, *d*, *f*, and *g* afford ample proof of this.

3. A cement-mortar of one part of cement and five parts of sand, showed, after 20 months' hardening under water, an average strength of 349·2lb. per square inch. Several of the briquettes were taken out of water, after a period of 12 months, and immediately placed in a desiccator; they were then dried for eight months over sulphuric acid, thus securing the elimination of all influence of carbonic acid. These briquettes broke, after 20 months, at an average strain of 490·3lb. per square inch.

These experiments prove, in a conclusive manner, that mixtures of cement and sand do not become disintegrated like neat cement-mortar; the addition of the sand removing effectually any tendency to contraction, and the consequent formation of fissures; thus the continuity of the mass is nowhere interrupted. On the other hand, we may safely conclude that the presence of these contraction-fissures is the sole cause of the disintegration of pure and rich cement-mortars when exposed to the action of the air.

The foregoing remarks will readily explain the complete fiasco which artificial stone has always been, when pure cement, or large proportions of the same, have been used.

THE USE OF MARBLE AND SIMILAR MATERIALS IN ENGLISH ARCHITECTURE.*

THE subject of my paper is the use of marble and similar materials in English architecture. Among these materials I include all those stones which have a slight degree of translucency and will take a polish, and which are valued in architecture either for their beauty and variety of colour,—as, for instance, the veined and breccia marbles, porphyries, serpentines, and some kinds of alabaster,—or else for their delicacy and purity, and the closeness and fineness of their texture, as in the case of statuary, Parian, and white alabaster. I have chosen this subject because the opportunity we Englishmen have now for using materials of this kind in our work is something novel in English architecture, and because, unless we recognise this novelty, and try to ascertain the proper principles by which to employ this new material, we are not likely to employ it well. It is true that it was not an unknown material in Mediæval England. This could hardly have been so, for in Devonshire it is a common building-stone, and every shower of rain makes the smooth flagstones of Plymouth look like slabs of polished marble. It would be more correct to say, that, though not unknown, it was almost ignored. And it was ignored not so much from choice as from necessity. M. Viollet-le-Duc observes that in France, where the use of marble during the Middle Ages was as rare as with us, if not rarer, romancists were fond of writing of marble palaces, and so forth, and that the chroniclers of the Abbey of St. Denis boast of the marble columns with which Abbé Suger surrounded the choir, which, however, turn out, after all, to be only of stone. It is most probable that the expense and delay of working marble was the real reason why it was neglected in a style which was the child of economy, and in an age when labour was costly and labourers few. However this may have been, in the earlier styles of our native architecture it is the fact that, with the exception of the simple grey marbles of Purbeck and others like them, which were employed chiefly in shafts, the use of marble was neglected. In the later periods of Gothic art, alabaster, which is soft and easily worked, came into use for monuments and reredoses, and similar small works; and, still later, marble was used a good deal in our English Renaissance, though even then chiefly in small work, such as monuments and chimney-pieces. The marbles then employed seem to be chiefly foreign, and to have been regarded as a rarity and used with economy. It has been reserved to our own age, when steam-transport by land and sea has relieved us of the necessity of using only local materials in our works, and when provincialisms in architecture seem destined to give way before a more general interchange of materials and modes of workmanship, to have marble brought to our doors so easily, and in such quantity and variety, that it fairly takes its place as one of our building materials.

Now, to those who take what I believe to be the right view of our position in the history of art,—who recognise the fact that we live in an age which is necessarily eclectic; building up for ourselves an art out of the teaching, not of one only, but of many bygone styles, all more or less unsuitable,—and who look forward to the development, in due course, of a really modern art which will represent us better,—the acquisition of a new material will be welcome as opening the way for a fresh departure in our practice. For every special need of our life which is met and satisfied, and every new material which is adopted and put to its proper use, must involve some modification of the adopted styles we work in; and each such modification, if made in accordance with true artistic principles, or, what is much the same thing, common-sense, must result in genuine progress. There is no need to urge the use of marble on modern architects. Ever since it has been easy to have it, there has been no lack of demand for it, and this is not wonderful. The first impulse seems to have been given by the books of Mr. Ruskin and Mr. Street. Delighted to find himself allowed, and even encouraged, to indulge himself in the study of a branch of Gothic architecture which had been forbidden by the sterner masters of Gothic purism, the student rushed to Italy and found there wonders of colour and exquisite finish of workmanship for which his Northern training had in no way prepared him. Accustomed to regard a 4in. marble shaft as an extravagance, and an alabaster pulpit or font as a matter for glorification, he suddenly found himself in a country where marble was used as a common building-stone. The sensation with which, for the first time, one stands in an Italian church, such, for instance, as that of St. Lorenzo at Genoa, where arches and walls of banded black and white marble are carried on closely serried ranks of massive columns of deep purplish red, is one of astonishment mixed with incredulity. And as the student travels further and becomes accustomed to see marble used universally for purposes where, in his less-favoured land, common stone would have been employed, his satisfaction grows in proportion as his wonder lessens. To many students after an Italian tour,—at all events, a *first* Italian tour,—the return to sober stone is like disenchantment, and it is no wonder that they seize every opportunity of using the material which has charmed them under an Italian sky. With this desire I have no wish to quarrel. We may safely welcome the new material and use it freely, provided we learn to use it properly and do not forget that it *is* a new material in English architecture, and that as a simple consequence its adoption must bring with it new methods and principles of design.

I propose to-night to touch successively on a few of the principles of design by which the effects which we admire in the marble-work of the past have been produced; and to show how, by the neglect of these rules, we moderns have constantly failed to succeed in making the most of our new material; and how we have sometimes even spoiled what might otherwise have been tolerably good work, by the improper use of a material which would have improved it had it been judiciously employed.

The first thing to be insisted on is that marble is not, as some seem to think, merely a more beautiful kind of stone, which may be used just where and how we might use stone, but with a correspondingly more beautiful effect. Marble has other differences from ordinary stone than its superior beauty. In the first place, it is generally much harder, and to work it involves infinitely more labour; in the next place, it has a slightly transparent quality, which requires special kinds of design to make one's work upon it tell distinctly; and again, in the case of coloured marbles, we have a totally new field of design opened to us differing from any that mere stone-masonry offers. All these points involve new considerations to one who has been trained exclusively in the Northern schools of Gothic architecture, which are distinctly stone styles. Their deeply-recessed orders, undercut mouldings, and elaborate traceries, the highly-relieved character of their decorative sculpture, especially the naturalism of some of it, are all derived from the use of stone, and are appropriate only to a soft, easily-worked material. There is nothing here to teach us how to make the best use of our new material. It is only from those who have been used to work it that we shall learn how to deal with it, and it is, therefore, to Italy that the student must look for instruction. In that country marble has always been a possible and the favourite material, and the true principles of working it have never been entirely forgotten. From the time when the Gothic or Lombard builder first began to carve rude marble capitals of his own by the side of those he pilfered from the ruins of antiquity, down to the time of the Renaissance, when perfect knowledge and unrivalled skill in dealing with marble seemed to make that stubborn material as plastic as clay in the artist's hands, we find it employed sensibly and with proper economy—by which I mean that no labour was unprofitably spent on it, and that the workman succeeded in producing the desired effect with the least possible fatigue. The principles of work according to which this result has been obtained are simply those by which every good school is guided; they are the same which, working under different conditions, produced the totally different styles of France and England. Decorative sculpture north of the Alps owes its character to the stone in which it was cut, and that south of the Alps to the marble in which it was cut, because in both styles the workman recognised and respected the qualities of the material he was at work upon, and as he worked in the direction which these qualities suggested to him, his work fell naturally into such a shape as best brought out the beauty of his material with least labour to himself. For instance, the first consideration of a sculptor or mason in marble would naturally be the hardness of it, and the time his work would occupy him. Every deep line in the foliage of his capitals would have, first of all, to be drilled out with a succession of holes, which would afterwards be joined together by the chisel into a regular sinking. This laborious effort is of itself enough to confine the carver to a stiff and regular mode of design. Of what use would it be to him to think of imitating the wild freedom of the stone carved capitals of the North, which have all the rapidity and boldness of a sketch, where we see that a few vigorous blows have sufficed to give a depth of shadow that it would take a week to produce in marble, and where there is an easy play and variety of line that can only be had where the chisel travels easily and freely, and finishes at once? To imitate this free work in a stubborn material is an artistic mistake of the first order, of which examples are not wanting even in old work. Most of you may be acquainted with the spiral colonnettes in the north and south portals of Chartres Cathedral, which support, if my memory is correct, the statues lining the jambs. The hollows of these twisted shafts are stopped by exquisite little bunches of leaves carved with a freedom and grace that have seldom been suppassed. They were evidently struck off in a happy vein, and quickly finished while the mood lasted, Those of you who have seen the front of Orvieto Cathedral may remember the spiral shafts of the doorways with their lovely mosaic inlay. The architect has there tried a similar plan of laying natural leaves at intervals in the hollows of his shafts, but with a far less satisfactory result. The freedom of the French example is entirely wanting. The leaves look laboured and heavy and leathery, for they took so long to work that all the zest of the original idea evaporated before they were one-quarter finished. To illustrate the difference between the two modes of work in the two materials, I may turn to the difference between an etching and an engraving. The etcher's needle travels sweetly and smoothly over the varnished plate. He can sketch as he goes on, with the utmost freedom, and finish his work a hundred different ways, whereas the engraver has laboriously to plough out line after line, to lay them parallel to each other, and to work evenly, regularly, and methodically. Just so the marble-carver. He must lay his lines firmly and positively in their right places, and work them out slowly and painfully. There is no rapid sketching for him; and therefore he cannot hope to succeed in those designs which answer best with rapid handling. In this I believe we find one key to the greater conventionalism of the decorative carving of Italian art, and perhaps even to that of Classic art itself. The stiffness of material led to stiffness of design, except in cases where labour could not be misapplied nor the sculptor's interest exhausted, as in the human figure. It would not be wearisome to carve a block of marble into a Corinthian capital, or one of those conventional capitals of the Early Renaissance, of which there is such an infinite variety, because its very regularity and symmetrical perfection precludes the idea of its being done otherwise than with care and pains, and in a considerable time. You are in no hurry to embody your idea before it escapes you, for you have laid down your outlines correctly from the first, and have only to fill them up. It is natural that work such as this, which takes a long time and considerable labour, should bear the stamp of laboriousness, careful arrangement, and perfect execution, rather than that of facility and freedom; and when the mechanical labour is so great as it is in the case of marble, it is natural that a great part of the less important ornament into which it is worked should be mechanical too. Hence, no doubt, the frequency in marble of such conventional ornaments as the egg and dart, and similar enrichments of Classic mouldings, which occur in Italian work even during the Middle Ages. The freer design of Northern carving is enjoyable only so long as it can be cut freely, and to carve it in marble would be tediousness itself in comparison with carving the more conventional ornaments I have named. There is, however, a free outlet for naturalism in marble, of which neither the ancient nor the modern Italians have failed to take advantage. It lies in the opportunity of working in low relief. In common stone

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considerable relief is generally necessary, partly because most stones have a coarseness of grain which interferes with a very delicate finish, and partly because even if the stone is fine enough it is seldom so hard as to make a low relief durable enough to resist ordinary wear. But marble is so fine of texture that every touch tells, and so hard that the smallest amount of relief may be safely trusted to last. I think no decorative sculpture shows more astonishing ability and more perfect appreciation of the material employed than some of the slighter reliefs of Italian art. Efforts of perfect solidity and modelling are produced with the relief of a bare ⅛in., and some of the finer lines are actually not relieved at all, but marked by a slight sinking of the ground or incising of a line round them. Here the labour is in comparison slight, and in the arabesques which cover the surface of the monuments of the Renaissance there is the utmost ease and grace and freedom of line, and often the most charming naturalism. But, above all, the Italian found room for naturalism in the representation of the human figure. There the labour required by the material suits the nature of the subject. In figure-carving there is no room for hasty suggestive work; all must be complete and well studied, and finish can hardly be carried too far. The superior artistic value of the work also seems to demand the most durable of materials, marble or bronze, and to repay any expense of time and labour. There is no fear of the artist tiring of work that he feels to be worth the trouble he bestows on it.

I turn now to another property of marble which distinguishes it from stone—its variety of colour. This introduces us to entirely fresh considerations, even more foreign to our native styles of architecture than those of which we have been speaking. At the beginning of this paper I distinguished two uses to which marble can be put and for which it is valuable:—1. The beauty and variety of colour of some kinds; 2. The compactness of texture and simplicity of colour of others. Now, though from one point of view we are in either case dealing with the same class of materials, from another point of view we are dealing with materials of two totally distinct kinds. They are distinct as the beauty of form is distinct from the beauty of colour. This is so simple a distinction that it seems at first sight hardly worth enunciating, and yet there is no more common error than to confuse it. Marble that is valuable for its colour is valuable for that alone. Nothing else ought to be present to our minds when employing it. To carve it is, except in very rare instances, a monstrous violation of the first principles of art. If, then, a marble, besides being coloured, has any *variety* of colouring, it is absurd even to work mouldings on it; and yet this is a thing that is done every day. The architect wants a marble base or capping, and fixes his affections on a lovely block of breccia mottled with yellows, reds, and blacks, on a nearly white ground; or a scarcely less beautiful piece in which white and coloured veins cross and recross one another or lie obliquely along the surface. On this he works the rolls and hollows of his base, or the details of his cornice, and is disappointed to find the result is not equal to his anticipations. The lines of the colouring contradict and confuse those of the mouldings. One does not know which to look at, the lines drawn by nature or those cut by by the chisel. The level lines which are necessary in such features for the proper architectural effect are upset by the irregular markings of the material, and the beauty of the markings themselves is destroyed by their being broken into by the mouldings, which distort them just as a drawing is distorted when rolled up. The mistake is simply this, that the radical difference between designing for form and designing for colour has been ignored. The effect is almost as bad when strongly-marked marbles, such as many of the Devonshire varieties, are used for steps. The effect of a flight of steps (and there are few more dignified features in architecture) depends on the regularity and evenness of the lines, and the simple alternation of light and shade in tread and riser. All this is destroyed by veins that run obliquely, and so distort the horizontal lines, or by strongly-massed colours, which interrupt the simple breadth of light and shade. In all the instances which I have given, the architect, caught by the beauty of the material, has thought that it would be sure to beautify anything he might use it for, and, having used it for an improper purpose, he ends by destroying both the form of the object and the beauty of the material. No material is worse abused at the present day in this respect than alabaster. Alabaster costs less than marble in the block, and being much softer, costs less in labour, and, consequently, is much cheaper as a material, and is, therefore, readily accepted as a substitute. With a little trouble it may be had quite white; but, as a rule, it is more or less strongly veined with warm brown streaks; and, strangely enough, it is this coloured alabaster that seems most popular, not only for plain work, but for sculpture. The absurdest effect is sometimes produced by its employment for groups of figures in a reredos, when the brown streaks run undistinguishingly across the face of an apostle or the drapery of a saint, blurring the features of one and confusing the flowing lines of the other in the most distracting manner.

The plain rule for all kinds of varied marbles is that they should never be used except for their colour, and in such a way as to make the most of their colour. They should be used in flat slabs, inlaid in panels, like pictures, or used for lining the surfaces of walls or large compartments of pavements, always in large enough pieces to allow the variety of the markings to tell; for, of course, if they are cut up into small pieces they will differ but little from self-coloured marbles. One very sensible way of using them is by splitting and reversing them, so that the veins and markings form regular figures, like the patterns formed by a kaleidoscope. This was very commonly done in Byzantine work, and may be seen at St. Vitale, Ravenna, and St. Mark's, Venice, and also, in later times, as in the palaces Vendramin Calerghi and Corner Spinelli on the Grand Canal, designed by the family of the Lombardi at the end of the fifteenth century. Perhaps the only lawful occasion for the use of variegated marble for actual parts of the architecture is that afforded by columns. Their form is so simple and clearly defined that the irregularities of the marble cannot confuse it, and the cylindrical surface is as well adapted for displaying the beauty of the markings of the marble as a flat surface would be. But such marbles should only be used for *plain* columns. If the columns were fluted the beauty of the material would be seriously diminished. The rule to employ a coloured marble, for the sake of its colour only, will, to a certain extent, apply also to self-coloured marbles, which have no variation of surface. The instances in which sculpture can be successfully applied to any but white marble are very rare, even if they are admitted to exist at all. I do not forget the Egyptian figures in black stone, porphyry, or granite, nor the red marble lions that carry the columns of the Lombard porches in North Italy. But it may be observed that these are all archaic works that stand very low in the scale of sculpture, being conventional and abstract to a degree which we are not likely to imitate, and indeed could not imitate without affectation. But the prohibition against the use of coloured marbles for our more developed sculpture need not prevent us from working mouldings on it, for if the colour be but uniform the mouldings are as well seen in one colour as in another, or even as in white. For bases, cornices, architraves, and steps, therefore, there can be no objection to the use of marbles, such, for instance, as the Veronese red, which is employed with such good effect in the north of Italy, or the black, which gives such dignity to many interiors in the Low Countries.

Whilst we are on the subject of coloured marbles, I would touch upon another rule, and a most important one; that is, to work with moderation, and a limited palette. The same rule applies, more or less, to all decorative arts. The breach of it has done more to degrade modern glass-painting than anything else. Seven tints of glass, I believe, sufficed the glass-painter of the thirteenth century, and with them, and no more, he produced those miracles of gorgeous colour which we see at Chartres, Bourges, and Canterbury. A similarly restricted palette was enough for the wants of the artists of the fourteenth and fifteenth centuries. The result was a harmony of colour and a simplicity of composition that were admirably suited to the purposes of architectural decoration. The modern glass-painters have, I believe, the choice of about 400 different tints, and many of them seem to avail themselves of the liberty of choosing without restraint, not with the happiest results. The only modern glass that is worth looking at has been designed on totally opposite principles, with but few colours carefully selected and artistically composed. And in the same way in the arrangement of marbles there can be no greater mistake than to use many varieties in the same composition. There are very few designs for which three kinds of marble would not be enough, or in which there would fairly be room for more. The marble screens of the Low Countries afford a good instance of the satisfactory application of this principle. One of the finest of them,—now removed, unfortunately, from its original site in the cathedral of Bois-le-Duc, and preserved, fortunately for us, in our museum at South Kensington,—is an example of the kind of screen I refer to, of which there are scores in the great churches of the Netherlands and French Flanders, beginning with the old church of Notre Dame at Calais. In this magnificent structure there are but three marbles employed,—black, white, and red,—and they are used according to the principles I have endeavoured to put before you. The white is used for sculpture, the black (which is of one simple tone) for the moulded architectural work, and the red, which is variegated, though of a very sober tone, for the columns.

There is another lesson to be learned from the practice of the best schools as to the usefulness of working with moderation and self-restraint in a material which offers so many temptations to over-display as marble. The beauty of some of the variegated marbles is so great, and their colours so powerful, that they often exercise a seductive influence on those who have had little experience themselves in the use of marble, and have paid little attention to the practice of those who have had more. Caught by the splendour of these more gorgeous varieties, they neglect the soberer kinds, and they arrange their magnificent materials so as to produce the most powerful contrasts and the most gaudy combinations. No marble has been more popular in modern churches than a brilliant light-green Irish marble, which is in itself of an almost hopelessly impossible colour to work with, but is often made still more offensive by being placed next a bright red. Such gaudy combinations as these are enough to vulgarise any design, and are quite at variance with the teaching of all the best schools, which employed not only very few marbles at a time, as I have just explained, but generally preferred those of soberer colours, and avoided strong contrasts. Indeed, when one is new to the study of Italian art, and when the first rapture at the wealth of marble that surrounds one is fresh, one is disposed at first to wonder why strong contrasts were so seldom resorted to, and why, when so many splendid marbles were to be had, the quieter specimens were preferred. A structure of white marble will often be relieved only by panels of pale breccia, as at the Giant's Staircase at Venice, selected evidently for their light colour and amount of white ground. At the Scuola di San Rocco, one of the most lovely and refined works of the early Renaissance, the principal staircase is designed with still greater delicacy, the white marble being inlaid with slabs of a pale warm grey. In the presence of work such as this it is only the young or inexperienced architect who will wish for more colour and decided contrasts. Those who have any real sense of art will soon learn to appreciate at their true value these quiet harmonies and subtle combinations of tints. It is, however, only on a large scale that the Italian masters dreaded and avoided strong contrasts. In their smaller inlays and mosaic patterns they sought brilliancy and distinctness, and used the strongest contrasts, not only of colour, but of light and dark. Strangely enough, it is in small work such as this that modern men seem to choose marbles that will not contrast, and arrange them so as to produce no decided effect. That disagreeable Irish green, of which I have spoken, is often used next to a piece of pale red, without that intervening white or black which would have prevented their running together, and the result is a confused piece of colour that has none of the brilliancy that is essential to design in mosaic. The true masters of mosaic worked in a very different way. They chose strong positive colours, the dark red of porphyry, and the deep green of ser-

pentino, if they could get them, and almost always separated them by white, or pale yellow. A beautiful effect is produced in the enclosure of the stalls at the Baptistery of Pisa by simply inlaying a dark green marble in the white marble of the inclosing wall, so as to form a pattern in dark green and white, of which the white is the actual material of the ground left between the dark inlaid pieces.* This kind of sharp, trenchant design is the descendant of the old Lombard inlaid work, such as that in the Duomo and San Michele at Lucca, and San Miniato at Florence, and it was continued in a later form in the incised work filled in with black marble or cement, of which there are examples in the doorways of the Palazzo Communale at Cremona, the screens at San Petronie at Bologna, and some fountains now in the South Kensington Museum. Here, again, should be noticed the very limited number of colours with which these mosaics or inlays are worked. In the glorious pavements of opus Alexandrinum which cover the floors and add so much to the beauty of the Roman basilicas, and innumerable other churches in Italy, and whose beauty is not less remarkable than their variety of pattern and design, there are seldom more than three kinds of marble used,—red porphyry, green porphyry or serpentine, and white; the white, however, generally cut from a marble which has veins of other colours in it, so that the piece which, according to the pattern ought to be white, is sometimes yellowish or pinkish or grey instead, and a certain amount of variety is thereby obtained, which prevents the hardness of a perfectly regular mosaic. The patterns thus produced are inlaid in a plain white marble field, and with these simple materials effects are produced which are not only harmonious, but constantly novel, each pavement having its own distinguishing character, by which it can be distinctly remembered.†

I turn now to another rule for the employment of marble, which may not be generally accepted, but which seems to me of no less consequence than the rest. Marble differs from stone, not only by its superior hardness and by its qualities of colour, but by its semitransparency and the polish which it takes. The combination of these qualities, but especially the last, makes it difficult to use marble and stone together in the same design. Carving in stone must be free, that in marble severe: design in stone must be well relieved, and expression must be given to it by architectural features; design in coloured marbles must be plain and flat, and characterised by smooth surfaces of colour; and on these grounds alone the two materials can scarcely be used safely together. But the contrast between the opaque granulated texture of stone and the polished semitransparency of marble is so great, and the effect, when they are placed side by side, is so disagreeable, as to be intolerable to an educated eye. If the marble is not polished, the contrast is more endurable; but then, of course, the full beauty of the marble is not brought out, and it is no better than coloured stone. It is less intolerable when marble is used for detached shafts, though even then it is a question whether simple stone would not have been better. The instance of the frequent use of Purbeck shafts in our English cathedrals is, I am aware, an authority that may be adduced against my rule; but I venture to think that even they are not always an improvement to the design; and it should be remembered that originally they did not stand as they now do,—stark and sharply-defined against white stone,—but were supported by coloured decoration on wall and pier, which has now disappeared. But if the sober grey of Purbeck may be forgiven, what shall we say for the multitude of marble shafts of all colours and sizes that one sometimes sees in modern churches?—round the pulpit, perhaps, a dozen little colonettes, 2in. in diameter, and round the font half as many more, all of different kinds and colours, reminding one of nothing so much as the samples of polished drawing-pencils in a colourman's window; and then, perhaps, on the piers or the jambs of the chancel-arch, large shafts of Cornish serpentine that look nearly black, and shine beautifully, all standing in hard cold relief against common stonework, and grating on the nerves by the disagreeable contrast between its dead surface and softened outlines and their glossy polish and hard positive forms? It is a safe rule that marble and stone should not be combined in the same design. If ever it is necessary to bring them near one another, let there be a strong definite line of separation, and let there be all marble on one side of it, and all stone on the other; so shall we minimise the unpleasant effect which almost always arises from the combination of materials so different.

These, then, are a few of the lessons which are taught us by the nature of marble and the other materials which I have classed together with it, and by the practice of those who have every claim to be considered as our masters in the use of them. Let me briefly recapitulate them:

1. Decorative carving in marble, as, for instance, in cornices, capitals, and friezes, where high relief and bold design are required, should be severe and conventional. Naturalism is forbidden by the stubbornness of the material except in the highest subjects, such as the human figure, which repays the necessary expense of labour, or else in very low reliefs when the labour of execution is reduced within moderate limits.

2. Sculpture should be in white marble, or, if in alabaster, only in such as is free from veins or stains of colour.

3. Moulded architectural features, such as bases, bands, strings, cornices, architraves, abaci, should be either in white or in some uniform colour without markings or veins.

4. Variegated marbles should be used only for panels or columns, or, in other words, on plain smooth surfaces, either flat or curved, so as to display the beauty of their markings to the utmost without interfering with any of the structural lines of the architecture.

5. Coloured marbles should be used in moderation, too great a variety being avoided, and those of the quieter and more harmonious tones preferred for general use.

6. Strong contrasts of colour on a *large* scale are dangerous, and generally incline to vulgarity.

7. Strong contrasts on a *small* scale, as in mosaics and inlaid work, are necessary.

8. Stone and marble should be kept apart as much as possible.

In conclusion, it will be useful to consider how far, with these principles to work upon, marble is suitable to our English architecture. Most of the rules which I have just recapitulated, and which are derived from observation of the material itself, and the modes of using it which have been suggested and taught by its natural qualities, seem to point rather to Classic than to Gothic design. Severe conventional foliage, restraint imposed on freedom of representing natural forms, large plain wall-surfaces, and large columns, all seem to belong to Classic architecture rather than to our native Northern styles, which delight in naturalism, break up the wall-surfaces with variety of architectural features, and compose their piers of small clustered shafts in preference to single columns, being in everything the very opposite of the mode of design which marble seems to require. And, indeed, I have no doubt, as I have already implied, that the qualities of marble have had as much to do with forming the character of Classic architecture, as those of stone with that of Gothic architecture. The very forms of Classic mouldings, with their square reveals and absence of undercutting, seem derived from the difficulty of working marble into hollows, and the necessity of right-angled sections, to throw distinct shadows in a partially translucent and strongly-reflecting material. But it does not follow from this that, unless we give up Gothic architecture, we must give up the use of marble; nor even that we must give up our Northern Gothic and adopt that of Italy, which is in many respects a marble style. Our native Gothic is the result of our native climate, and our own natural character; and I for one believe firmly that no style will ever firmly root itself among us which is not at bottom based on the art which sprang up among us spontaneously, and which in country districts retained an obscure lingering existence all through the reign of pure Classicism and down to our own days. But our architecture may still remain true to Gothic principles in spite of our adoption of materials and conditions for using them that are new to the Gothic of the past. For instance, the art of the Early Renaissance among us is much more a Gothic than a Classic art. The mansions of Kirby, Hardwick, and Burleigh, in England, and those of Chambord and Blois, in France, have nothing in common with Whitehall or Versailles. They are in principle Gothic buildings, in spite of the features and ornaments they have borrowed and adapted from Classical architecture. It was not until the Gothic element in the Jacobean style dropped out, and the temptation to indulge in the glories of pure Classic architecture triumphed, that we ceased to have a native style of our own; and we lost it then not because we carved acanthus-leaves in our capitals, and made our shafts to taper, and copied the sections of Classic mouldings, but because we adopted the principles of Classic construction. Now we too, like our forefathers in the 16th century, have a choice of styles before us. Eclecticism is forced upon us. Unless we work like pedants we cannot help being influenced by other styles than Gothic, even if we make that the basis of our work. We must be bigots indeed if we refuse a noble and beautiful material because we find the rules for employing it to advantage are different from those that are proper to the stone we have been accustomed to. We should rather, as I said before, welcome it as an opportunity for a fresh departure, as a lever for lifting our modern work out of the groove of mere imitation of one style among the many from which we have to learn our lesson. On our architecture externally the adoption of marble can have little effect. Our climate forbids its use. Even in Italy the conglomerate marbles and breccias become disintegrated by exposure to the weather, and in England it would be folly to use them out of doors. White statuary is with us scarcely more durable, and though that harder kind of Carrara which for some mysterious reason we are in the habit of calling Sicilian is more durable, it soon loses in the external air all the appearance of marble, and looks little, if at all, better than any other white stone. Coloured marbles, too, are of little use to us for external decoration, for their polish soon disappears, and with it their peculiar beauty, and they soon become less effective than many ordinary stones that are available for the same purpose, such as the red magnesian limestone of Mansfield, the grey Forest of Dean, the red sandstones of Bristol and other places, and the purple sandstones of St. David's, all of which have the advantage over marble of durability under exposure to an English climate. But in the interior of our buildings there is ample opportunity for the use of marble. It is, indeed, the only stone which is tolerable in positions where we must touch or brush against it. The passion of the earlier Gothic revival for showing honest building material within doors has fortunately run itself out; it was never warranted by the usage of the original style, and it was found practically inconvenient. Our stone chimney-pieces came off white on our clothes, grew smoky, and could only be cleaned by rubbing or scraping away the material; our stone fenders became dirty, and people wore them away by putting their feet upon them. And in more important architectural features it was found more comfortable to come into contact with wood and plaster than with bare stone. To marble, however, none of these objections apply. It is perfectly cleanly and so hard that wear has little effect upon it within doors; and though in private dwellings its costliness must prevent any very large use of it, it need not exclude it altogether, while in public buildings nothing can be more appropriate or beautiful than marble for door-cases, isolated piers or pillars, staircases, balustrades, pavements, and in more important buildings linings of wall surfaces, and even the structural members of the architecture itself. Of its suitability to church architecture there is no need for me to speak, for one seldom enters a modern church without finding marble used somewhere, though not always with good taste and judgment, nor in the right place. My subject has, perhaps, novelty to recommend it to your notice; for, largely as marble is now employed, there has, so far as I know, been but

* Several examples of inlaid work similar to this, in dark green and white, or with the addition of a dull red as a third colour, are illustrated in Waring's "Arts connected with Architecture in Central Italy." Plates 22 to 30.

† Several pavements of opus Alexandrinum are illustrated in Sir M. D. Wyatt's "Geometrical Mosaic of the Middle Ages" *inde* plates 1 to 7. Restraint in number of colours may also be observed in the illustrations of decorative art in other materials in the same volume. See also Gruner's "Specimens of Ornamental Art."

little attempt made to reduce the method of using it to any definite principles. We have rather dropped into the practice of employing it as we think best, without any general rules to guide us, and, consequently, we often employ it very absurdly and irrationally. It is time we began to consider the matter more scientifically, to apply to this new material those general principles of common sense and utility by which we admit all good art is governed, and thereby to arrive at some general rules by obeying which we may avoid mistakes for the future.

DR. WALDSTEIN ON GREEK SCULPTURE.—II.

THE period of Greek sculpture preceding the days of Phidias formed the subject of Dr. C. Waldstein's second lecture at King's College, Strand, delivered on Tuesday afternoon. During this time the art was slowly emerging from the difficulties of archaic attempts to represent living forms in a lifeless material. The art, as he had already stated, had three stages: that in which the material itself obtruded itself on our notice; that in which forms of life were pourtrayed; and that in which effect of a breathing, moving life was exhibited in these forms. The earliest forms of the art were carvings on wood, and it was not, therefore, remarkable that the most primitive examples of sculpture which had come down to us, although reliefs executed in stone, had an essentially wooden treatment. The surface was planed smooth, the outlines were straight to suit a grain, instead of following the curves as easily executed in marble, and the backgrounds appeared to be peeled or pared off; the technic handling, in short, was that of the carver's knife, and not of the mallet and chisel, and reminiscences of the traditional working in wood were very evident. This might readily be noted in a drawing on the wall, reproducing a relief-slab recently found in Sparta; it represented two seated female figures, and the pose and the whole treatment were conventional as well as rude and stiff. These characteristics were not due to intentional efforts to gain dignity and repose, as was the case in Oriental art, but resulted from the inherent difficulties of carving in wood; first in modelling in such a material with a marked "grain," then by the circumscribed space afforded in a tree-trunk, and lastly, by the brittle and light substance. All three combined to induce the sculptor to represent his figures full-length and upright, to place the arms close to the body, and plant the feet together, and to avoid unnecessary projections of limb or head. But a series of inventions and of social changes concurred to remove the rigidity and conventionality of treatment. About 650 B.C., the period of the 30th Olympiads, Butades, or Dibutades of Corinth, was reported to have been the first to model the human form in clay, in a pretty story which told how the potter's daughter, seeing her lover's form cast in profile on the wall, sought to secure a permanent record by a silhouette of clay. About the same time Glaucos, of Chios, invented the art of soldering iron and other metals, that is, of welding, in place of riveting the pieces; and almost simultaneously, Melas, of Chios, discovered the art of sawing marble. A still more valuable discovery followed at the time of the 50th Olympiad, when Theodoros and Rhoikos, of Samos, found out the mode of casting in bronze. Each of these discoveries reacted on the other, and did much to advance the art of sculpture by showing the artist how to conquer the materialistic difficulties of his art, and the artist was led to abandon the traditional wooden outlines and treatment. By modelling in the tractable and plastic clay, he could with a turn of the finger alter and improve his conception. No longer restricted to the circular trunk, he could saw figures in a freer pose from the marble block, and could by soldering add arms to figures. But the most important step was the discovery of the art of casting in bronze. In marble sculpture much of the rougher work was necessarily entrusted to assistants, but in a bronze statue the probability was that we possessed the exact imprint of the master designer's fingers upon the clay model, and an accurate transcript, therefore, of his thoughts. The progress of these discoveries combined to increase freedom in the handling of material, and the question arose, Given the ability to reproduce similitudes of forms, what forms shall be selected for reproduction? Gradually, painfully, laboriously, it was decided that, out of the infinite variety of forms of life around the artist he must make a selection, that he ought to choose to represent those outlines the uses and attributes of which were harmonious with each other, and suitable for his material and branch of art. In all art there must be a greater regularity of design, harmony, or symmetry, than is to be found in nature; but the highest art will unite with this some attempt to represent the ever-flowing movement, the vitality, the rhythm, of organic life; rhythm must, indeed, be combined with symmetry to produce a pleasing result. In the earliest work, the quality of conventional symmetry is most apparent; but an increasing amount and play of form and line is introduced into the work. Symmetry was the distinguishing feature of the work of Sparta and the Peloponesus; rhythm, the characteristic of Athenian work, and it was the political combination of these schools of artists which led to the highest results. Drawings were shown of early Spartan and Athenian sculpture to prove that each failed to reach the ideal from a different cause. The transfusion and mutual advance of these schools was brought about by various causes between the years 530 and 470 B.C. Three distinct schools marked the change: the most noteworthy artist of the school of Argos, Ageladas, represented the human figure in an essentially academic manner, and was not so distinguished as a sculptor but as the teacher of the more successful artists, Myron, Phidias, and Polycleitos. The school of Sicyon (Kanachos) was also an important one, and the third school was that of the island of Ægina, who, according to Pausanias, were a little hard in the representation of the human figure; of this school Kallon and Onatas might be taken as representatives. The sculptors of the last-named school profited much from observing the agonistic palestræ. Not only did the artists of this school learn anatomy and the play of form from watching the nude youths of Greece contending in the athletic games, but also because statues of the victors were required, and these required a different and more vivacious treatment than the statues of gods previously in vogue. Another cause, besides the progress of invention in modelling and casting and the establishment of the Olympic games, aided in the development of freedom in sculpture, and that was the use of the pediment in architecture. A low triangular space of considerable width had to be occupied by a group of figures, having an emblematic meaning. It was soon apparent that it was unseemly to place over a temple-entrance a row of upright figures gradually diminishing in height. Such a sunk panel might indeed have a deity of unusual size in the centre, but the sides must by filled with figures looking forward, or with rearing horses, and the extremities by crouching or reclining persons. Great variety of position and attitude was consequently called for, and a distinct gain to the art resulted. These varied developments brought about by many causes were not consecutive, but concurrent in many parts of Greece; there was a development marked by many relapses, a tide which had its flow and partial ebb, a progress in the representation of living movement, which ultimately overshot its mark in the restlessness and contortions of the Discobolus of Myron. On Friday next he hoped to show some of the stages of this growth of Greek sculptural art in the galleries of the British Museum; but he trusted that enough had been said to show that the art of Phidias did not spring Minerva-like from a single brain, but was the outcome of a laborious birth, of a childhood marked by many stages, in which a forward movement was not always apparent, and of a youth which was aided in its development by several coincident causes, which he had endeavoured to distinguish and classify.

PRACTICAL VENTILATION AND WARMING.*

MR. JOSEPH CONSTANTINE, of Manchester, has written a sensible book on this subject, purporting to be a contribution to the practical knowledge we possess rather than a treatise on first principles. There is, perhaps, on the whole more to be learnt by contributing facts of a practical kind than in elaborating theories of ventilation, of which we have had enough. It is, after all, upon actual practical data that the science of ventilation can at all hope to be built up, and every acquisition of reliable information must be hailed with satisfaction. Mr. Constantine deals chiefly with a number of instances where large buildings have been "successfully dealt with," and if the information so furnished can be relied upon, the work cannot fail to be a useful guide to the profession. Among the illustrations furnished we find the Glasgow University scheme, the Lariboisière Hospital, Paris; Free Trade Hall, Manchester; the Royal Exchange and Concert Hall of the same city. It is better to cull from good authorities than to write long chapters of merely speculative opinion; and we therefore can appreciate the long quotations given by the author from Professor Huxley on the amount of air breathed, and other useful data referring to the differences observable between inspired and expired air, the quantities of carbon eliminated, and the amount of water given off from the lungs; and the no less valuable quotation from Dr. Angus Smith's work on "Air and Rain," where that able analyst of the atmosphere gives the results of the most refined analyses of the air, showing the fine differences in the amount of oxygen in pure and variously tainted air to 4 places of decimals. We might be tempted to examine some of these figures and conclusions, but must proceed to notice the work of the author.

As Mr. Constantine points out, there has been too much speculation and theory; and perhaps what is worse, those who set themselves up as authorities are "specialists who have taken up some particular cowl or valve, and are anxious to publish its virtues." Passing over the introductory remarks on the ventilation of the Houses of Parliament, and the importance of plans of the arrangements introduced, the author illustrates by diagrams the plan followed at Pentonville Prison, now an old model, but considered a successful though costly scheme. As many of our readers may not know, the cold air is introduced through flues in the basement, and passes through coils of hot pipes in chambers below the main corridor into vertical flues which convey the fresh warmed air to each cell near the ceiling. Another set of flues carries the vitiated air away, which is extracted from the bottom of each cell on the opposite or outer side, and the current is increased by artificial heating on the roof below the central foul air shaft. The same system was introduced at the Glasgow University, but, as it appears, unsuccessfully. The class-rooms, when crowded, were so oppressive that windows had to be opened, thus subverting the original arrangement which allowed cold fresh air to be supplied to each class-room besides the warm air. The abandonment of this provision was fatal to the success of the scheme. As the author says, an ample supply of fresh air was needed in the class-rooms occupied by the larger number of students, which supply might have been secured by inlets on the so-called "Tobin" principle. In speaking of infirmaries and hospitals, the author recommends the combined sash and pivot casement, the latter falling inwards, which has been used in the board-schools, so that the current of fresh air may be diverted upwards. With the Sherringham valve, also, stagnation of air under the beds may be avoided. Captain Galton's stove, or a warm-air chamber in basement, with flues to the ward, are both good means for warming; the last method is recommended as being more economical. General Morin's system is illustrated of having hot-water coils fixed in the wards and corridors, each coil being encased and supplied with a constant current of air from the outside. The system has been used at the Lariboisière Hospital, and is said to be preferable to the English plan of running the pipes through the rooms which simply warms the air of the room.

The author justly condemns the unsatisfactory means used to warm churches and chapels, town halls and concert-rooms; a variety of methods, but no principle, appears to be adopted, and the variation in the cost of warming such places is not the least significant feature in such plans. By taking advantage of the difference of temperature in any building where people assemble from the outer air, a circulation and diffusion of air may be obtained, and this idea is illustrated by reference to the system carried out at the

* Practical Ventilation and Warming. By JOSEPH CONSTANTINE, Manchester. London: J. and A. Churchill, New Burlington-street.

Free Trade Hall, Manchester, the great hall of which can seat 4,000 people, and contains 500,000 cubic feet of air. As one of the best ventilated rooms, Mr. Constantine quotes the description which appeared of this system in the BUILDING NEWS of May 25, 1877. It is briefly as follows:—Round the basement under floor runs a brick flue, 3ft. by 2ft. 2in., supplied with fresh air from three openings. From this flue 18 vertical flues 2ft. by 1ft. 2in. rise delivering the air to the gallery about 8ft. from floor. The foul air is carried away by openings round 15 sunlights in the ceiling, communicating with two flues on each side of hall roof. These meet at one end and discharge into an upright shaft 7ft. 9in. × 5ft. 7in., surmounted by a cowl. For further details we refer the reader to the description. A plan and section of the hall show these arrangements. At a crowded meeting it was found the outlet of air was 9,300 cubic feet per minute, its temperature being from 180 to 208 degs. Fahr., due largely to the gas burnt. Latterly the hall has been warmed by two large convoluted stoves costing £270, placed at one end, and the result is said to be satisfactory. About four hours is required to produce a comfortable temperature. A lengthened description, with plan and section, follows of the Manchester Royal Exchange by Messrs. Mills and Murgatroyd, architects, where the ventilating and heating arrangements have been found simple and effective. Fresh air is drawn from the top of building by means of a shaft 6ft. square with a cold-air chamber fitted with filter-cloths at the bottom; the warming has been effected by Messrs. Constantine's convoluted stoves, two of which are fixed in the basement. The warm air is conveyed by two flues which run the length of the central nave, the outlets being by branches in the plinths of the columns. The three domes are used as ventilators. The whole cost of warming and ventilation has not exceeded £550, a small sum certainly. A similar mode of ventilation and warming was adopted for the Concert Hall of the same city, though on a larger scale. A plan and section of the building are given; these show lath-and-plaster foul-air flues in the roof leading to a ventilating shaft, the vitiated air being collected at several points. A convoluted stove has been substituted for the hot-water apparatus in the basement, and a fresh-air flue introduced, and the arrangement answers well.

Speaking of theatres, the ventilation of the Théâtre Lyrique, Paris, is described. General Morin's plan is adopted. The vitiated air is extracted through numerous openings in the lower part of the boxes, passages, and the risers of the steps in the gallery; each pair of boxes have a separate discharging flue, and the area of openings is sufficient to allow the velocity of air not to exceed 2·3ft. to 3·6ft. per second. The heating apparatus flue pipes are carried up the exhaust shafts to aid the draught. We quite agree with the author, that it is a mistake to extract the vitiated air at the floor level in the risers of the gallery, as the occupants seated in it must inhale it. Another of the engravings shows a method of warming a church, adopted at Herne Hill, near London. The air is drawn from the outside beneath the floor, and it passes through a hot-air chamber with a convoluted stove, after which the warmed air rises through flues, and enters into church through three gratings in the floor at the east end. Mr. Constantine asks "Why should not every church, chapel, and school have a lath-and-plaster duct in the roof for the purpose of ventilation? Where there was a tower or spire that would form the best possible exhaust shaft." A small turret might be constructed for the purpose. It is absurd to attempt to warm churches with large open roofs by steam or hot-water pipes in the floor, as the cold upper surfaces create the downward current of air so often experienced. The author alludes to a variety of other buildings warmed and ventilated on the system described, among them the Manchester Pantechnicon, a mansion at Oakworth, Keighley, and the Arlington Baths, Glasgow, and these examples are illustrated by plans and sections. For houses a cellar fitted with a heating apparatus or convoluted stove and a smoke-flue leading to a chimney with branch outlets for the delivery of warm air to the hall and chief rooms, are all that is required. Of course fire places can be dispensed with. An apparatus with four deliveries will not consume more fuel than one open fireplace. We cannot allude to the plans shown for heating and ventilating baths and stables, nor enter into the concluding sections, which will be found to contain much useful information on air-warmers and boilers, stoves, &c. The convoluted stove, patented by Mr. Constantine, is a more effective form of heating apparatus than the "cockle" and "gill" stoves, and when combined with a properly-constructed system of flues and means for the escape of vitiated air, it affords an economical means of warming and ventilating buildings.

REMOVAL OF SNOW IN THE CITY.

A SOMEWHAT unseasonable report in the present weather has just been issued, namely, that of the Engineer to the City Commissioners of Sewers, Col. William Haywood, on the removal of the snow after the great storm of January 18th. Mr. Haywood says the superintendent of street-cleansing considers the fall of snow to have been from 8in. to 9in. during the 18th and 19th; but, to avoid exaggeration, he takes 6in. as the depth. On this assumption, there were, before compression of the snow by traffic, on the entire area of the city, about half a million cubic yards, of which, about 133,000 were on the public ways, and fully 70,000 of that quantity on the main lines. The 350 men and boys in the employ of the Commissioner were set to work immediately the snow commenced falling to keep the crossings and the carriage-way channels clear, and 233 extra hands were taken on during the day. During the night the men were allowed to rest; but on the second day a total number of 1,287 men and boys, and 288 horses and carts were employed as a cleansing staff. The work was carried on night and day continuously till the 26th, the average number employed being 1,429 hands, 502 horses, and 490 carts; the extra hands were nearly all adults, and were engaged for six hours and then paid off, that being the amount of continuous labour that could be done in the snow. The rate of pay was 6d. per hour for first seven days, and subsequently 4d. per hour. Supervision was difficult, but was carried out by the foreman of street cleaning, the inspectors of pavements, and foremen of paving contractors, and masons from the city stone yard.

The greater portion of the snow was carted to London and Blackfriars bridges, and there thrown over the parapets into the river Thames. Large quantities were deposited upon the vacant lands, nearly 2 acres in extent, at Golden-lane and Petticoat-square. Snow was deposited on the open spaces at Smithfield, Finsbury-circus, and the vacant land at Whitefriars, and in all very wide streets. Attempts made to melt the snow by sprinkling it with rock-salt failed, owing to the severity of the frost. Clarke's apparatus for melting snow by gas, constructed in 1870, and used from time to time from that date, was brought into operation, and upwards of 800 cubic yards of compressed snow were melted by it. In Finsbury-circus additional apparatus of a similar character was temporarily fitted up, and 238 cubic yards were melted by it. The total cost of the removal of the snow was £4,254 1s. 3d.

HAYWARD'S PAVEMENT LIGHTS.

TO Messrs. Hayward Brothers and Eckstein, the manufacturers of these well-known lights, much is due for having utilised the reflecting power of the lenses, as well as combining them in the best possible manner for gathering and distributing the rays of light. These important advantages have been secured without deteriorating from the upper surface as a pavement; in fact, we find a firmer foothold has been secured for traffic, and that there is no unevenness of surface which can harbour dust or dirt. We have recently inspected their own basements at 74, 76, and 78, Queen Victoria-street, E.C., which have been fitted up with the patent semi-prismatic lens and other lights, and which show, in a very obvious and satisfactory manner, the advantages to be derived from their use. The basement in question is entirely lighted from the pavement lights introduced in front, and is now used as an office. Five basement or area windows have been thus utilised, which give as much light as they would if they were on the upper story exposed to direct light. The lights are of the usual size for ordinary windows, the prismatic lenses being arranged chiefly on the outside, so as to throw the rays well into the room. The prisms are of the "B section," of which there are different sizes made, and are fixed alternately with the diamond lenses which chiefly transmit overhead light. Nothing can look neater or brighter than these frames of lenses. The light in the basement is uniformly distributed, and no dark corner visible; in fact, with windows fitted with the prismatic lenses, it would be quite possible to carry on any work in a basement which under ordinary circumstances would be too dark to work in without gas. By using the "semi-prismatic lens," daylight may be thrown in any direction to a distance of 60ft. or more. The iron frames are made to various patterns: rectangular and hexagonal frames are chiefly in request, though any design or shape can be made. The rectangular frames are of cast-iron, and admit of prismatic lenses 4in. by 3in., or 4in. by 6in., or other size, with diamond or convex lenses, or rough plate. They rest by a flange upon the stone curb. Messrs. Hayward and Eckstein also manufacture a "cube lens," 6in. by 6in., for road traffic, capable of standing any heavy or rough wear; and their semi-prismatic stall-board lights are excellent means for reflecting a strong light from a front stall-board under a shop window, into the basement. These vertical frames of lenses may be fixed in combination with the pavement lights, and the frames are cast in ornamental forms. The improved safety coal-plates made by this firm combine all the essentials of safe fixing, light, and ventilation. The frames have a deep flange or rim, which prevents the slipping up of the coal-plate which has so often been attended with danger and fatal results. Circular pavement lights for cellars, subways, &c., are manufactured to all useful sizes, from 10in. to 40in. diameter, and can be glazed with prismatic or diamond-cut lenses; we also find this firm have applied the same principle of prismatic reflecting lenses to ships' decks, and several of them have been fixed in the steamships of the Orient and Pacific companies with excellent results. Besides lighting our underground spaces and vaults, Messrs. Hayward have turned their attention to ventilation, and supply Arnott's Boyles' outlet, Sherringham's inlet, and other kinds of ventilators. Hayward's Venetian ventilators are useful for either inlets or outlets; they can be fixed in any wall either to insure a regulated supply of air deflected to the ceiling, or in a dry flue for the purpose of an exit. The louvres are easily adjusted by a weight to any angle, and various sizes are kept in stock.

AMERICAN ENGINEERING.

THE "Proceedings of the Engineers' Club of Philadelphia," of which the second volume has appeared, is full of interesting topics, chiefly Transatlantic. The annual address of Mr. Frederic Graff, the retiring president, occupies the leading place; a phototype of his portrait is given. Mr. Graff touches upon a variety of subjects—the plan and route of the inter-oceanic canal without locks, proposed by M. de Lesseps; the ship railroad of Captain Eads to effect the same object; the completion of St. Gothard tunnel, and the proposal to bore the Simplon, to shorten the distance between Paris and Milan at least 120 miles. The use, says Mr. Graff, of drilling-machines worked by compressed air makes these projects feasible. Allusion is made also to the project of tunnelling under the Hudson river by compressed air, which the sinking of caissons for the piers of St. Louis, Brooklyn, and other bridges had proved practicable; the use of hydraulic pressure for elevators in hotels; the application of compressed air to street railroads and cleansing out sewers; the adoption of rack and pinion roads on steep grades; the means of transporting tram-cars by steel wire cables moved by a stationary engine, as at San Francisco; the elevated street roads of New York, which appear to be gaining the confidence of the people for safety; steel manufacture; electric lighting; the erection of movable dams at Davis's Island, on the Ohio; and other matters. A paper on the Panama Canal and Isthmus, by Col. J. Worrall, discusses the merits of the various routes, and calls Nicaragua the best, as it averages unprofitable sea navigation and saves lockage. The Tehuantepec route is considered far more costly, though, all things equal, it is thought to stand No. 1. The Panama route is considered less expensive, but other objections are made to it.

"Strength of Wrought-iron Columns," by Mr. T. M. Cleeman, member, is another valuable contribution to which we may again refer. Mr. Chas. A. Ashburner describes the progress of the second geological survey of Pennsylvania, which was undertaken to determine the location of the coal. Prof. L. M. Haupt discusses the subject of intercommunication in cities, and the best means of planning streets. The author thinks a definite relation must exist between the are as devoted to public and to private purposes, or to streets and to buildings. He shows clearly that the rectangular plan of streets is wasteful of distance and energy to all persons whose objective points are on the diagonal lines, and that every such individual must lose 42 per cent. of his time, distance, and energy in travelling between the termini of his route. The author proposes to open avenues in Philadelphia on this system wide enough for two lines of street cars, four or six carriage-ways, with 20ft. side-walks well shaded with trees. It is calculated these would save $1\frac{1}{3}$ mile for every person required to move diagonally across the heart of the city; it would open up over 12 miles of building lines for trade purposes. The paper is supplemented by tables and a map of the city, prepared by Mr. Samuel L. Smedley, the City Surveyor. The location of the railroads is another section of the paper, and various useful suggestions are made which might, to our English notions, be regarded as visionary, or at least unnecessary. M. Haupt's ideas might be very well extended to the improvement of the streets of London, as well as Philadelphia; and we are sure something could be done to take away the reproach of having so complicated and bewildering a system of railway communication as we have here, particularly south of the Thames. The distribution of population in Philadelphia shows that the areas of densest population form two zones, one on the north and the other on the south, while the middle zone is less dense. Diagonal lines of communication are suggested by the author, which would greatly reduce the distance travelled of vast moving populations, besides saving time and labour; and he thinks that the annual saving to the entire population would amply pay for the accomplishment of the scheme, a view which has been arrived at from data certainly of the most ample kind. The annual reports, especially that of the Committee on Land Surveying, and the notes and communications may be read with interest as indicating the activity and energy of the engineers in the great western city.

ALFRED STEVENS: A BIOGRAPHICAL STUDY.*

THE lives of great men, including artists, are often full of instruction and encouragement as well as interest, and a biographical sketch of a great artist, written by a discerning mind, may, therefore, be of more value to the cause of art than a volume of designs. Mr. Walter Armstrong, the author of a biographical study of Alfred Stevens, the designer of the Wellington Monument in St. Paul's Cathedral, has done some service in this way, and his highly appreciative memoir of this talented artist will be read with welcome. The work is a thin folio of 47 pages, and is illustrated by a number of able designs by the late Alfred Stevens, drawn in a spirited manner by John Watkins. Into the biographical details of this modern master we need not enter, though, like many great artists, Alfred Stevens began in a comparatively humble sphere, his father being a house-decorator, of Blandford, in Dorsetshire. At eight years of age he showed such undoubted skill with his pencil and brush, that his benefactor, the Hon. and Rev. Samuel Best, supplied him with the means of visiting Italy to study works of the leading schools of artists. Here he remained nine years, but his independent judgment and taste enabled him to resist the influences of the schools, and to make them subservient to his own ideas. Mr. Stevens saw the value of uniting the sister arts, and making his own particular work adjunctive and accessory to architecture. We need only look through this book to see the principle and architectural feeling which underlie all his designs of a decorative character. His design for a frame for a diploma of honourable mention, which forms the frontispiece; the calorifere; the design for the chimney-piece, of various marbles, for the dining-room of Mr. Holford, Dorchester House; and especially the monument of Wellington in St. Paul's, afford undoubted proof of the architectural conceptions of the artist. Soon after arriving in England, Stevens obtained an appointment in the School of Design at Somerset House as master. Decorative work was now largely thrown in his way, and in his hands evinced much individuality of character. The doors and doorway of the School of Mines, Jermyn-street, under Mr. Pennethorne, are one of his best works, conceived in a dignified Florentine style, the panels of which are filled with typical figures of the Sciences, are in the highest style of sculpturesque relief. Stevens adopted a less pictorial treatment to Ghiberti—a more structural character prevails. Mr. Armstrong refers to Stevens' stay in Sheffield, and his influence over its School of Art. He competed for the decoration of the Houses of Parliament, though unsuccessfully, probably from the little sympathy he showed for Gothic. But the greatest work of this artist was the design for the Wellington Monument, and we find a pretty full account furnished of the circumstances of the competition. It is well known many disappointments were experienced by the artist; his model was approved by the architects, Professor Cockerell and Mr. Penrose among the chief, and its fitness for the arch under which the monument had to be placed was decisive. Stevens contracted to execute the work for £14,000, but his full-size model cost about one-third of this amount. Coherent in design, and the artist's individuality impressed upon it, we have no modern monument that can compare with it. The altar-tomb in the choir of San Giovanni e Paoli, Venice, and the tombs of the Scaligers at Verona, have been named as the sources of inspiration; but the resemblance is not perfect. The author briefly refers to Stevens's design for the decoration of St. Paul's. His mosaic of Isaiah is a fine conception, and his sketch of Daniel is highly spoken of. The former was executed by Salviati in glass mosaic. This artist's scheme for the decoration of the dome, purchased by the committee, formed the basis of Sir F. Leighton's and Mr. Poynter's design now being executed, and which we have already described. The decorations of Dorchester House, for Mr. Holford, are among the most noticeable works, many of which are illustrated. A panel for a mantelpiece in faience for Messrs. Benham and Sons, and the decoration of a saloon and ceiling at Deysbrook, near Liverpool, are among the illustrations of the designs. We may notice also a casting from a bronze stove, some fire-dogs, and designs for candlesticks, exhibiting a wonderful fertility of imagination, with a thorough conception of decorative character and details, worthy of the artists of the Renaissance. One of his best designs in the book before us, is a buffet in sculptured walnut, for Dorchester House, a work remarkable for its architectural coherence and vigour. Few artists could treat surfaces more successfully, and his playful outlines and bold chiaroscuro are equally striking. The bronze group of "Valour triumphant over Cowardice" in the Wellington monument, is fit, as Mr. Armstrong says, to take its place by the side of the work of any other sculptor, living or dead. "His painted ornament shows," says the author, "a quick grasp of form, a deep knowledge of the value of chiaroscuro, and a strong feeling for colour." The arrangement of his details appear to possess an organisation of their own. As a draughtsman, Stevens was equally skilled. His effective pencil and water-colour cartoons and sketches are referred to by the author, and the masterly way in which he could work simultaneously with pencil, charcoal, and brush. Much suggestive information will be found in Mr. Armstrong's interesting biography.

* Alfred Stevens: a Biographical Study. By WALTER ARMSTRONG. London: Remington and Co., New Bond-street.

DURHAM CATHEDRAL.

CANON GREENWELL, at the annual meeting of the Archæological and Architectural Society of Durham, told the members they were in danger of losing their cathedral. The cathedral was gradually crumbling away. He had observed that many of the mouldings had lost now their sharpness by this crumbling process, and anyone could scrape off much of the surface of the stones with his hands. This destruction was going on over the whole of the cathedral; and unless it was stopped, and no measures had as yet been taken to do so, it would in the course of years prove destructive to great portions of the building. This was very much to be deplored, and they might naturally ask what was the cause of it. It was by exposing the surface of the stone to the action of the atmosphere. The stones had been covered for many centuries with whitewash, and when this was removed some sort of wash ought again to have been applied. A wash of lime of a better quality than the ordinary whitewash might have been used. At present the stone was liable to two destructive actions—one from the stoves and the other from the gas. There could be no question whatever that the stoves and the gas were working in a very injurious manner upon the stones deprived of their protection of whitewash. Under these agencies the stone was constantly being disintegrated; and, unless that action was stopped, before long the building would be seriously damaged. This was a subject of the very deepest importance. He did not know that they had any power to do anything; but he trusted that the subject would be brought before the attention of the cathedral authorities, and that they might take the necessary steps. There was another form of destruction taking place in the cathedral, and that was the formation of a salt upon the surface of the stone. This had been going on for a great number of years in the Dean and Chapter Library, and by this action the mouldings put in about twenty-six or twenty-eight years ago were decaying away. He took it for granted that what was taking place in the library would also take place in the cathedral itself. He had seen it himself, small crystals of a sort of salt upon the surface of the stone.

THE SANITARY INSTITUTE EXAMINATIONS.

AT an examination held by the Sanitary Institute of Great Britain on June the 2nd and 3rd, six candidates presented themselves, and the Institute's certificate of competency as local surveyor was awarded to Samuel S. Grimley, and to Arthur Whitcombe, and the Institute's certificate of competency as inspector of nuisances was awarded to John Iatem Cowderoy, to Joseph Rains, and to William Wilkinson. The following were the questions submitted:—

EXAMINATION OF INSPECTORS OF NUISANCES (TWO HOURS GIVEN).

1. A nuisance having been reported to exist in a certain house, what steps should you take? What is meant by a recurring order?
2. What are the provisions of the Public Health Act with regard to the exposure of infected persons and things?
3. Describe the method of measuring the available air-space in rooms. How much air space is desirable? How much should be insisted on?
4. How is water likely to be contaminated—
   (*a*) In wells in a country district?
   (*b*) In cisterns in houses?

   How can such contamination be prevented?
5. Mention the various disinfectants in common use, and state which you consider the best for particular purposes? Describe the methods of use and the precautions necessary.
6. What are the objects of a water-trap? Describe good and bad forms of traps? What is meant by disconnection of waste-pipes, and what are its objects?
7. Describe the duties of an Inspector of Nuisances with regard to food exposed for sale in his district?
8. Describe any manufacturing process which is liable to be a nuisance. How would you deal with it?

EXAMINATION OF SURVEYORS, PAPER 1 (TWO HOURS GIVEN).

1. What is a Provisional Order? When does it become law, and for what purposes may it be obtained?
2. What are the most important provisions of the Public Health Act of 1875? How have they been modified by subsequent legislation?
3. How are sewers ventilated in towns? Why are they ventilated? State the objections which have been made to the systems adopted, and criticise those objections. Illustrate your answers by sketches.
4. Mention some of the plans used for flushing sewers in cases where a sufficient fall is impossible, and give your opinion on their practicability and sanitary advantages. State the objects to be obtained by flushing. To what extent does the admission of storm-waters into sewers affect the question of flushing?
5. If you are called upon to report whether or not the connections of the drainage of a house with the sewers have been properly made, in a town which has adopted the model by-laws of the Local Government Board, to what points would you more particularly direct your attention? Illustrate your answers by sketches.
6. How would you propose to deal with the excreta and slop waters in villages and isolated houses?

EXAMINATION OF SURVEYORS, PAPER 2 (TWO HOURS GIVEN).

1. How is water filtered on a large scale for town supply? Illustrate your answer by sketches, and also state under what circumstances such filtration is likely to purify water sufficiently for health?

2. What is meant by constant water service? How may water become polluted in places where this system is adopted?

3. State the supply of water per head which you consider necessary—
   (*a*) For an urban district?
   (*b*) For a rural district?
What proportion of this is generally used and what proportion wasted? Which is the more economical (as regards the expenditure of water), the constant or the intermittent system?

4. What amount of fresh air must be supplied per hour for each individual for health? To what extent and in what manner does the quantity depend on the size of the room in relation to the number of occupants? Explain by one example how your result is arrived at.

5. What are the objections to "made soils" as foundations for houses? What precautions would you take in respect to them? What are the chief causes of dampness in dwellings? How is dampness to be prevented or remedied?

6. Under what circumstances could a new building be condemned as unfit for occupation?

NÎMES CATHEDRAL AND ST. BAUDILE.

A TRANSFORMATION is in progress in the old cathedral at Nîmes, possessing still a fine, though mutilated, Romanesque façade; it was, internally, a heterogeneous styleless structure, chiefly of the dark ages of architecture. The plan of the building consists of a wide nave, without aisles, but with chapels of some depth between the buttresses; and a large choir and apse. The works at present in hand include the complete removal and rebuilding of the choir, the shoring and supporting of the vault of nave, which is retained (a quadripartite vault of 15th century), and the removal and reconstruction of the nave arcade, triforium, and clerestory. The works were commenced two years ago, and those to the nave are approaching completion; but the new works in the choir are only just begun. The architect is M. Revoil, of this city, a gentleman well known in France for his work in the Romanesque style, which he has of course adopted here. As he expresses a desire that until it is completely finished his work may not be criticised, this short notice must be confined to description.

The nave is, strictly speaking, in four bays, but in that next the choir, instead of the triforium and clerestory over the chapel, the wall is set back to the outside of the buttresses, thus forming a gallery or pseudo-transept. Sturdy three-quarter round vaulting shafts, attached to flat piers, divide the bays. The nave-piers are square, with attached columns carrying the inner of the two orders of the arches, which are semicircular in form, and have only beads upon the angles by way of moulding. The simple hollow hood-mould is continuous, running horizontally round the vaulting shafts from bay to bay. Above this a triforium of four round arches (three in the narrower western bay) resting upon polished marble shafts of a rich red brown colour, and square engaged piers at the ends. The clerestory is of single, lofty, round arched lights, with shafted jambs, and two strings form a deep band or frieze between it and the triforium, the capitals of vault-shafts ranging with the upper one. The windows in transepts are in two lights. The west end is in two bold round arches, one over the organ loft, the other carrying it over the entrance. The choir arch is also semicircular, and is emphasised by advancing the shafts supporting it beyond the general line. The choir is to be of similar design, but with an aisle round; of this part only a small portion is yet erected. The exterior is very little modified, and, except the western façade, it is almost entirely concealed by surrounding buildings. Bold massive buttresses rise a little above the chapel roofs, and the new clerestory windows are contained within recessed round arches, with corbels marking the springing.

The carved capitals throughout are very rich, and characterise the building. They are formed with combinations of leaflets of fleur-de-lis form, instead of the more ordinary acanthus, and have been the subjects of considerable study, plaster models in position being always used for their designing.

In conclusion, it may be permitted to add that the general effect is very promising; of course, as much of the scaffolding yet remains, and the building is incomplete, M. Revoil is justified in postponing criticism.

The church of St. Baudile is a handsome building, lately completed, on the Boulevard des Carmes. It is Geometrical Gothic in style. The nave is of five bays, with lofty arches and aisles, a triforium of three trefoil-headed shafted openings of very agreeable design, grouped with circular window of clerestory under a pointed arch, whose shafts, running down at the side of those to vault, help to make an effective cluster. The clerestory window is traceried with seven cinquefoils. The vaults are very domical, the wall ribs being stilted, and diagonal ribs raised to the same springing level, upon little shafts standing on the main capitals, at sides of the massive transverse ribs. The effect of this is very pleasing. The piers below are less satisfactory. They continue in rectangular forms the arch lines above, with hollow chamfers on angles, and have flat corbels instead of capitals. This is, perhaps, the weakest point in the design; it has the feeling of a timber, rather than a stone, construction.

The aisle windows are in two lights, with trefoil over.

There are transepts which continue the design of the nave in the first bay, and have the second grouped with the end. This has a large five-light traceried window, with arcading under, and beneath these an entrance lobby in centre with a small chapel on each side of it, the three divisions being grouped under a gallery with pierced parapet.

The choir has two bays similar to those of nave, but narrower (the triforium being in two openings instead of three). Beyond these quadripartite vaulted divisions, two transverse ribs are placed about 5ft. apart, with a section of waggon vault between. This doubling of the ribs, with their shafts and buttresses, is extremely expressive and effective, both internally and externally. The sanctuary beyond is in one bay, the sides being in two lofty arcades with circular window under the vault, the lighter design forming a transition to the traceried end. The east end is square and novel in design. It appears, internally, as one great window; but the main divisions and transoms are so massive that the openings group in two tiers of two light windows (three in each tier), and with three traceried circles over, filling the pointed arch. The great centre circle, with twelve cusps, is a fine dominant feature; and altogether this bold treatment is as successful as it is novel.

The choir-aisles form two chapels opposite the aisles of nave, also with square ends; and here again is a little novelty. The vestiaries are beyond, to the east of the chapels, and access to them from the transepts is given by narrow passage aisles managed outside the chapels, and across which these are somewhat agreeably lighted. The high altar is, as usual, advanced to the front of the sanctuary.

Coming to the exterior: The great east window has small buttresses between the three lower subdivisions, and the heavy primary forms of the tracery are lightened, with shafts and roll mouldings upon the angles, with a broad fillet between; the subordinate tracery being of the usual proportions.

Two octagonal turrets turn the angles of this front.

At the sides of the church the buttresses are ordinary, and of moderate projection; the flying buttresses to nave are simple, and have small pinnacles rising through the cornice; and a pointed arch contains each circular clerestory window. The transepts have, beneath the large windows, entrances of one pointed arch, moulded and enriched, but too much stilted, with gablets over, ornamented with carved crockets, &c. The doorway has a lintel and carved tympanum.

The west front is flanked by two towers, a little slim, perhaps, for their height; with five stories of openings, the smallest below, and finished with gablets and pinnacles, and spires, which last have three bands of quatrefoil and trefoil piercings. Between the towers the entrance is of similar character with those to transepts, but larger and richer, and with a trefoiled and shafted gablet on each side, containing a statue standing level with the arch springing. The gablet to this doorway rises in front of a gallery with pierced parapet, and over this is a round window with radiating tracery and pointed arch, flanked by smaller blank arches upon shafts. The centre circle of the window has a clock with the hours in the twelve cusps, a novelty which has a somewhat too practical air. A strongly marked string or cornice crosses the base of the gable, which is adorned with a statue and canopy standing clear of the wall.

Altogether this church offers many good suggestions, and in general design shows a better appreciation of that vertical character upon which so much of the beauty of Gothic architecture depends, than do most modern French Gothic buildings.

The external dimensions are, approximately, length, 190ft.; width, over nave and aisles, 70ft.; over transepts, 100ft., height of nave about 80ft.

The architect is M. Mondet, of Bordeaux, another of whose churches was lately mentioned in these pages. R. W. GIBSON.

CHIPS.

Mr. T. Roger Smith is a candidate for the appointment of Professor of Architecture, at University College, London, resigned by Professor Hayter Lewis. Mr. Roger Smith has had considerable experience of the duties, having been appointed in three separate sessions, by the Council of the College, to lecture in the absence of the professor.

St. Faith's new parish-church is about to be erected at Wandsworth. The building will consist of nave, chancel, north and south aisles, organ-chamber, tower, and spire, and vestries beneath the chancel, and will be built of Berkshire press bricks, and Box-ground stone dressings. The church will accommodate 800 persons. Plans have been prepared by Mr. John Pitt Bayly, of Paddington.

A new wing added to the Western Infirmary, Glasgow, was publicly opened on Wednesday week. It will be known as the Freeland Wards, is on the east side of the original buildings, contains 200 beds besides nurses' accommodation, and cost £40,000.

Mr. Thomas Greenacre, master builder, of Methwold, Norfolk, was killed on Friday by the fall of a wooden cradle in which he was being drawn to the top of a windmill which needed repair.

A new Wesleyan chapel is about to be erected at Warmington, near Oundle, from the designs of Messrs. James Kerridge and Sons, of Wisbech.

Extensive alterations and enlargements have just been carried out at the police-court and police-station, St. Neot's, Hunts. Mr. R. Hutchinson was the architect, and Mr. William Osborne the builder.

The parishioners of Swaffham have just placed in the north side of chancel of the parish-church a stained-glass window, to the memory of three children of the vicar. The work has been executed by Messrs. Heaton, Butler, and Bayne, of Garrick-street, Covent-garden.

An inquiry was held at Chard, Somerset, on Wednesday week, before Mr. J. Thornhill Harrison, C.E., of the Local Government Board, with respect to the application of the urban authority for sanction to borrow £5,500 for sewerage purposes. It is proposed to carry out works on the sodium process, as adopted at Taunton.

The Wesleyan chapel at Ripley, Derbyshire, was reopened last week, after repairing and other improvements, carried out by Mr. John Fletcher, builder, of Greenwich by Ripley. The outlay has been £350.

An inquiry was held at the Town-hall, Grimsby, on Tuesday week, before Capt. R. C. T. Hildyard, an inspector of the Local Government Board, in reference to the proposed scheme of main drainage for Grimsby and Clee-with-Weelsby. Mr. Maughan, borough surveyor of Grimsby, explained that sewers were to be constructed from his plans, at a cost to the borough of £9,220, and that these included a joint drain on the boundary of the borough, of which one-third would be paid for by Clee and two-thirds by Grimsby.

A new Catholic church is about to be built for Mr. Coventry Patmore, at Hastings, from the designs of Mr. Basil Champneys.

A coffee tavern, erected on part of the site of the Queen's Bench prison, Borough-road, was opened by the Earl of Jersey on Friday. Rows of houses in flats are in course of erection on the area formerly occupied by the prison, which will house about 800 families, and already 100 families have entered upon occupation. The contractor is Mr J. W. Hobbs.

The corner-stone of new girls' board-schools was laid in Tuel-lane, Sowerby-bridge, on Monday. Messrs. Utley and Gray, of Halifax, are the architects.

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ILLUSTRATIONS.

BREAGHWY, CO. MAYO.—LIBRARY INTERIOR.—DESIGN FOR THE INTERIOR OF AN EXCHANGE.—SKETCHES FROM COUTANCES.—THE CHURCH OF OUR LADY OF THE ROSARY (DOMINICAN PRIORY), HAVERSTOCK-HILL.

OUR LITHOGRAPHIC ILLUSTRATIONS.

BREAGHWY, CASTLEBAR, COUNTY MAYO.

THE house at Breaghwy, near Castlebar, of which we give an illustration, is the residence of Mr. Dominick A. Browne, J.P., High Sheriff, County Mayo. It is built on a gently rising ground in a well-wooded and picturesque park, and commands beautiful views of the extinct volcanic mountain Croagh Patrick, and of Keplin, the highest of that range of hills. The stone used is a fine hard white boulder stone found in the neighbourhood. It is finished with a broken or rock face, and the dressings and red sandstone quarried a few miles away. The roof is slated with Kellaloe slates. The building has been some time in progress, owing to the difficulty of getting any responsible contractor. Mr. Browne has had to make his own bricks, burn his own lime, quarry the stone himself, and most of the work has been done by workmen in his immediate employment under the direction of Mr. W. M. Fawcett, the architect, Cambridge.

LIBRARY INTERIOR, CAPTAIN BENNETT'S HOUSE, AT MANCHESTER.

THE woodwork shown is all in American walnut and black mouldings. The decorative panels are done by Mr. J. Thomas. Care has been taken to have the materials, colours, &c., of the woodwork, curtains, paper, &c., in thorough harmony, so as to produce a unity of effect. Messrs. Salomons and Ely are the architects.

THE INTERIOR OF AN EXCHANGE—TITE DESIGN.

We give this week a second sheet of illustrations of the design for an Exchange interior, by Mr. R. W. Collier, which was awarded the Tite prize by the Council of the Institute this year. A full description, by the author, accompanied the first series of drawings published in the BUILDING NEWS of the 27th ult.

SKETCHES FROM COUTANCES.

THE town of Coutances is built on the sides of a hill, and the accompanying sketches show two of its steep streets. The cathedral, a noble building of grand proportions, is built on the top of the hill, and about the only flat portion of the town is the *Place* in the front of it. One of its western towers is shown in the distance with the Tower of St. Pierre, a building of the 15th and 16th centuries, close to it; the other sketch shows the choir and Italianised Gothic tower at the crossing of the same church.

F. A. P.

THE CHURCH OF THE DOMINICAN PRIORY, HAVERSTOCK HILL, N.W.

THE church, mainly built of brick, in the style of the 13th century, consists of a nave and choir, terminating in a polygonal apse, with lofty windows of two compartments, the aisles flanked with fourteen side-chapels, according to the prevailing type of the larger Dominican churches. The interior length is 200ft., the nave, of eight bays, being 140ft., and the choir 60ft. by 30ft. in width, under one roof; the height from the floor to the wall-plate is 60ft. The roof is arched and boarded, with transverse and diagonal ribs. The aisles are 16ft. in width, spanned by stone arches, and the fourteen lateral chapels 15ft. each, with a gable and triplet window. The arcaded clerestory is supported on lofty stone columns and arches, and has a light gallery of iron. The Lady-chapel, built, like the choir apse, on the ashlared walls of the original plan, commenced by the late Mr. Gilbert Blount, is approached by an external porch, and connected with the north aisle of the choir. It has clustered columns, stone springers, timber groining, and three deeply-recessed brick arches for the altars, coupled lancet windows, and six-foiled circles over them. The principal front of the church has a double doorway to the nave, surmounted by a quatrefoil for a sculptured group, and foliated spandrels, flanked by the porches of the aisles; a lofty window of four compartments, with geometrical tracery, and a large rose window in the gable over, which is open to view in the nave, within the arch of the roof. The work has been carefully executed by Mr. E. W. Kelly, of Windsor, builder, from the designs and under the superintendence of Mr. Charles A. Buckler, architect.

COMPETITIONS.

EPWORTH.—For the proposed cemetery lodge and mortuary chapel the Epworth burial board have accepted the plans of Messrs. Wilson and Masters, of Sheffield and Doncaster.

GLASGOW. — The committee on Municipal Buildings of the Glasgow town council state that the committee have resolved to appoint Mr. Charles Barry, architect, London, and Mr. Carrick, city architect, to advise the magistrates and council as to the preparation of the conditions of competition by architects for the plans of the new municipal buildings.

WINCHCOMBE BOARD SCHOOLS.—The Winchcombe School-board examined on Friday week 18 sets of designs sent in for the proposed boys' school; the estimated cost varied from £660 to £1,700. Nine were sent by London architects. Ultimately, the following eight were selected for final decision: Chatters and Chandon, Cheltenham, estimated cost, £1,070; Medland and Son, Gloucester, £1,000, and in plainer style, £700; D. Hawkins, Cheltenham, £1,000; Sturdy and Yates, London, £896; Bevan, Bristol, £890; Bromilaw and Cheers, Liverpool, £875; and W. Lunn, Kidderminster and Pershore, £660. At an adjourned meeting held on the following Tuesday, the designs of Medland and Son, Chatters and Chandon, and Bevan, were further selected. Messrs. Medland's more expensive plan was proposed for adoption, when a member urged that their plan ought to be ruled out of court, as it contained two classrooms, and only one was asked for in the conditions as advertised. If Messrs. Medland were allowed to alter their design, the other competitors ought to have equal opportunities. In the final vote, Messrs. Medland's £1,000 design was adopted, Messrs. Chatters and Chandon's being rejected by a majority of one vote.

The annual report of the Fitzwilliam Museum Syndicate, Cambridge, states that the collection has been re-hung during the past year, and has been enriched by two donations—a Madonna and Child, by Pinturicchio, presented by Mr. S. Sandars, M.A., of Trinity College, and Jacob's Dream, by Professor Legros, presented by the artist.

The internal roof of St. Agnes' Church, Kennington-park, is being decorated in colour and gilding by Mr. C. E. Kempe.

The *South London Press* asks: Would the Commissioners of the proposed baths and washhouses at Streatham be surprised if Mr. Arding, who has just retired from the commission, were to be appointed architect of the new building?

Digby parish-church, near Sleaford, was reopened on Tuesday week, after restoration of the nave, and the addition of a new chancel. Mr. Kirk, of Sleaford, was the architect, and Messrs. Pattinson were the contractors.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The closing meeting of the session was held on Wednesday last, the Earl Nelson in the chair. Mr. G. R. Wright, F.S.A., detailed the progress of arrangements for the Congress at Great Malvern, which will be held in August. Visits will be paid to many places of interest, and by the invitation of the Mayor and Corporation, two days will be spent at Worcester. Mr. R. Blair, described further discoveries at the Roman station, South Shields, and the Rev. Dr. Hooppell an inscribed tile found at Lincoln. Mrs. Rendle Clay exhibited a gold-beetle from Yucatan, said to live to a fabulous age. Mr. Loftus Brock, F.S.A., exhibited a great number of Greek and Asiatic headless penates, in illustration of the custom still prevalent of destroying the heads when discovered, to preserve the finders, as they suppose, from the evil eye. Mr. H. Prigg described a Roman ring with an intaglia found at Bury St. Edmund's. Mr. John Brent, F.S.A., reported the discovery of other Roman articles at Canterbury, some of which were exhibited. The Rev. S. M. Mayhew then proceeded to describe a fine collection of glass vessels illustrative of the manufacture of that material from comparatively recent times backward to a remote period. Among the articles produced were various works from Venice, and some fragments of Roman glass of similar make found in London, and showing that much of the ancient Venetian work is but a survival of what was well known and practised by the Greeks and Romans. Some examples of Egyption glass indicated that the art was still of older date. Mr. Thos. Morgan, F.S.A., called attention to the occurrence of glass mosaics even in England, and referred as an example to some of the pavements at Brading. Mr. H. Syer Cuming, F.S.A. (Scot.), described a Saxon stone cross recently found during some repairs at Bolton Church, Lancashire. A paper was then read by Mr. Cuming on "The Representation of Mermaids in Various Middle-Age Works," and a drawing of a perfect mermaid from a stained-glass window formerly in Great Yarmouth Church was exhibited, while many descriptions from old authors were referred to. Mr. E. Walford, M.A., reported that the demolition of the old west front of St. Alban's Abbey, under the specious plea of its restoration, had actually commenced.

CAMBRIDGE ANTIQUARIAN SOCIETY.—The annual meeting of this society was held on the 30th ult., the retiring president, Professor Hughes, F.S.A., in the chair. The yearly report mentioned the continuous growth of the society, which now numbers 224 members. There is a balance of £262 10s. in hand to meet the cost of Professor Babington's new work on "Ancient Cambridgeshire" and other books about to be issued to members. The Rev. R. Burns, M.A., Prælector in Archæology, was elected president, and the Rev. W. W. Skeat, M.A., Professor of Anglo-Saxon, vice-president. Mr. W. B. Redfern exhibited and described a collection of Mediæval spurs and stirrups, and Mr. Bidwell showed a red Romano-British terra-cotta vase, a patera of Samian ware and a mortarium, all recently found near Ely a foot beneath the surface. Sir P. Colquhoun sent a communication on the true site of Dodona.

PARLIAMENTARY NOTES.

RAILWAY STRUCTURES.—Mr. Lindsay, last Friday, asked the President of the Board of Trade whether the committee, which he stated in the House of Commons in July, 1880, was appointed to consider what rules it might be desirable to make with regard to wind-pressure upon railway structures, had yet made a report; and, if so, whether he would be prepared to lay it upon the table of the House. Mr. Chamberlain said that the report would be made shortly after the Whitsuntide recess, and that he would consider whether it was desirable to lay it upon the table.

At a meeting of the committee of the Bishop of Chichester's Funds, the following grants were made:—St. Matthew's church, Kemptown, £300; St. Luke's church, Albion-hill, £250; All Saints parsonage, Lewes, £100; Kirdford parsonage, £100; Upperton parsonage, Eastbourne, £100; Bognor new church (additional), £100; Newhaven chapel of ease (additional) £50.

CHVRCH·OF·OVR·LADY·OF·THE·ROSARY

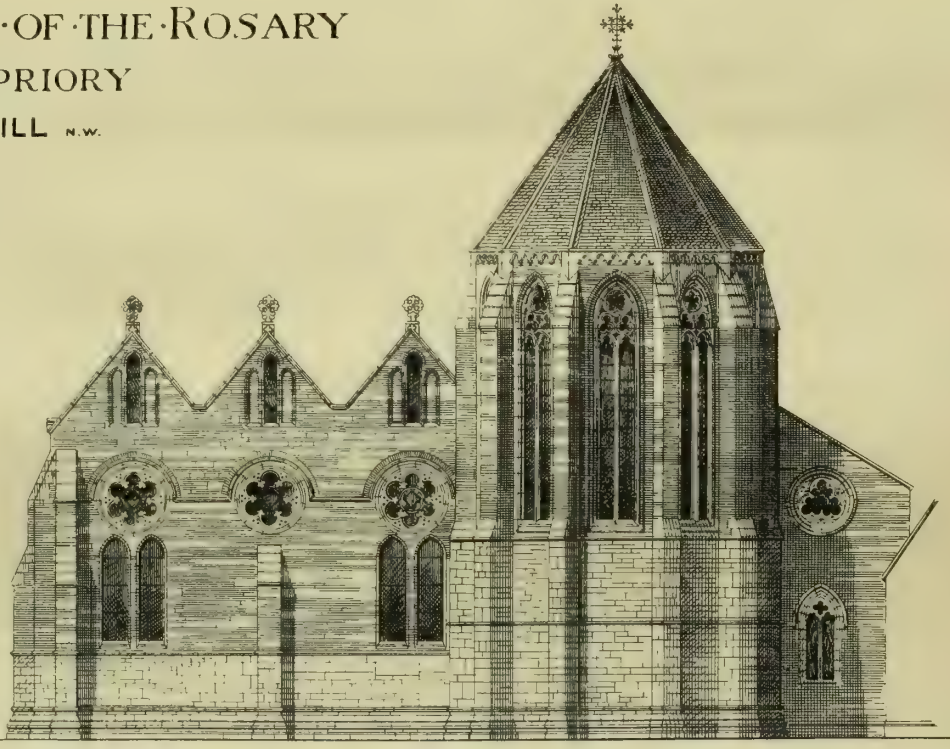
DOMINICAN PRIORY

HAVERSTOCK HILL N.W.

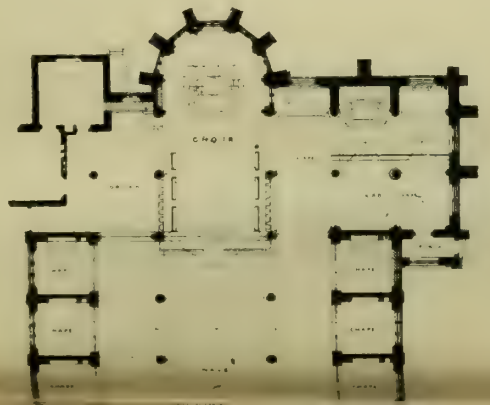
C.A.BUCKLER

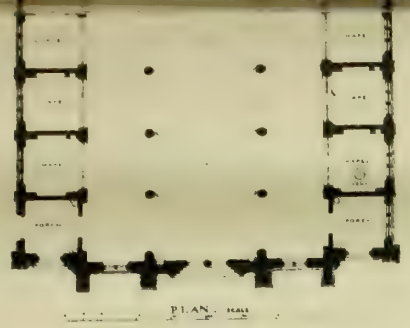
ARCHITECT

Principal Front



Lady Chapel Apse





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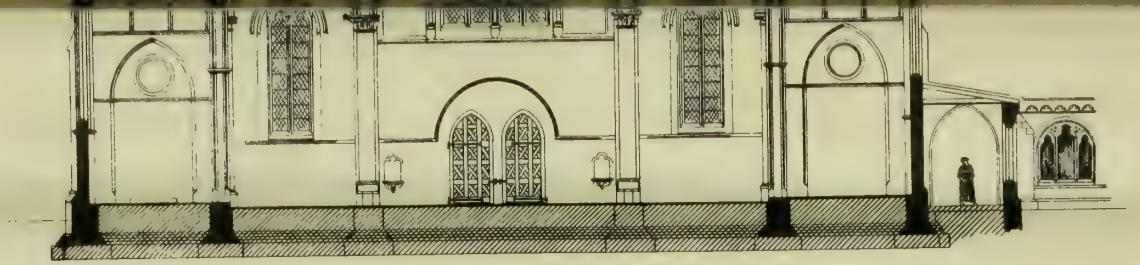

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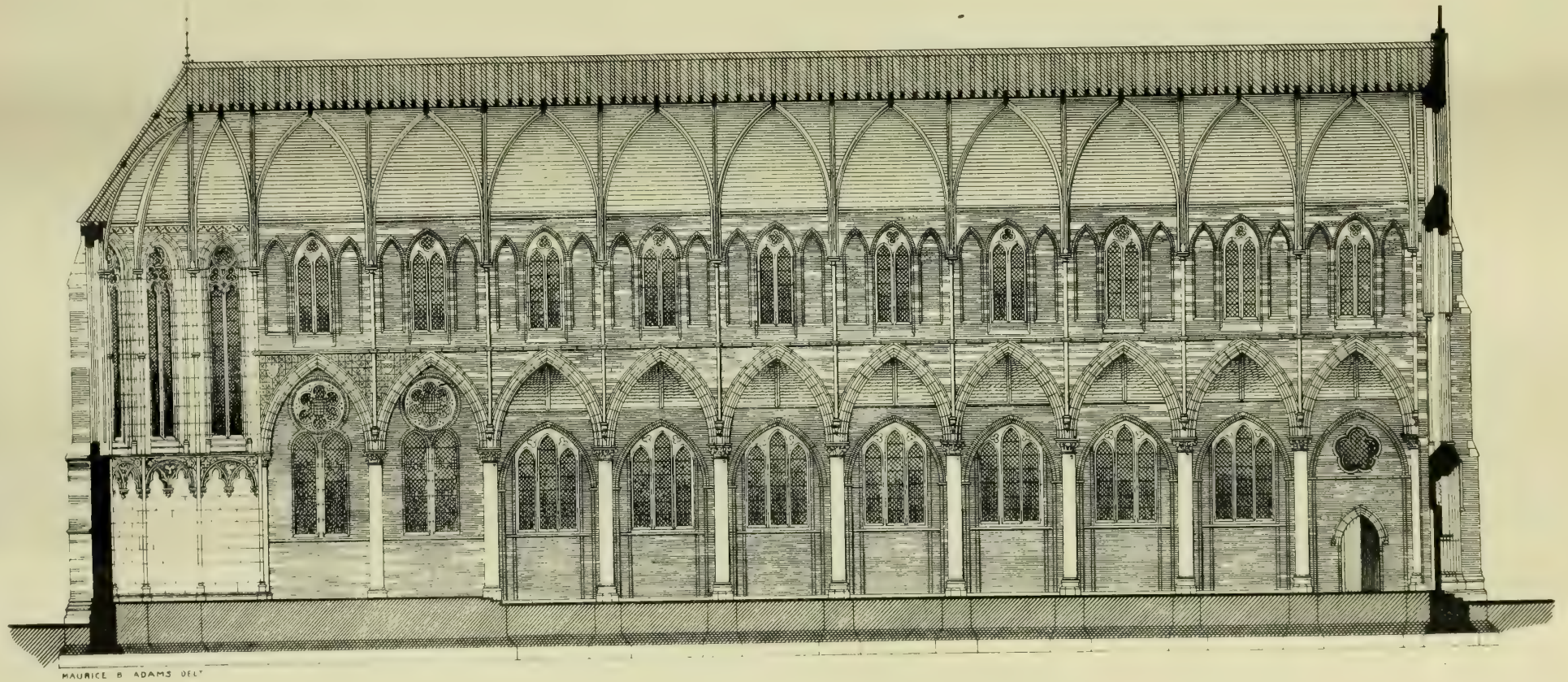

MAURICE B ADAMS DEL^T

Longitudinal Section

SCALE OF FEET

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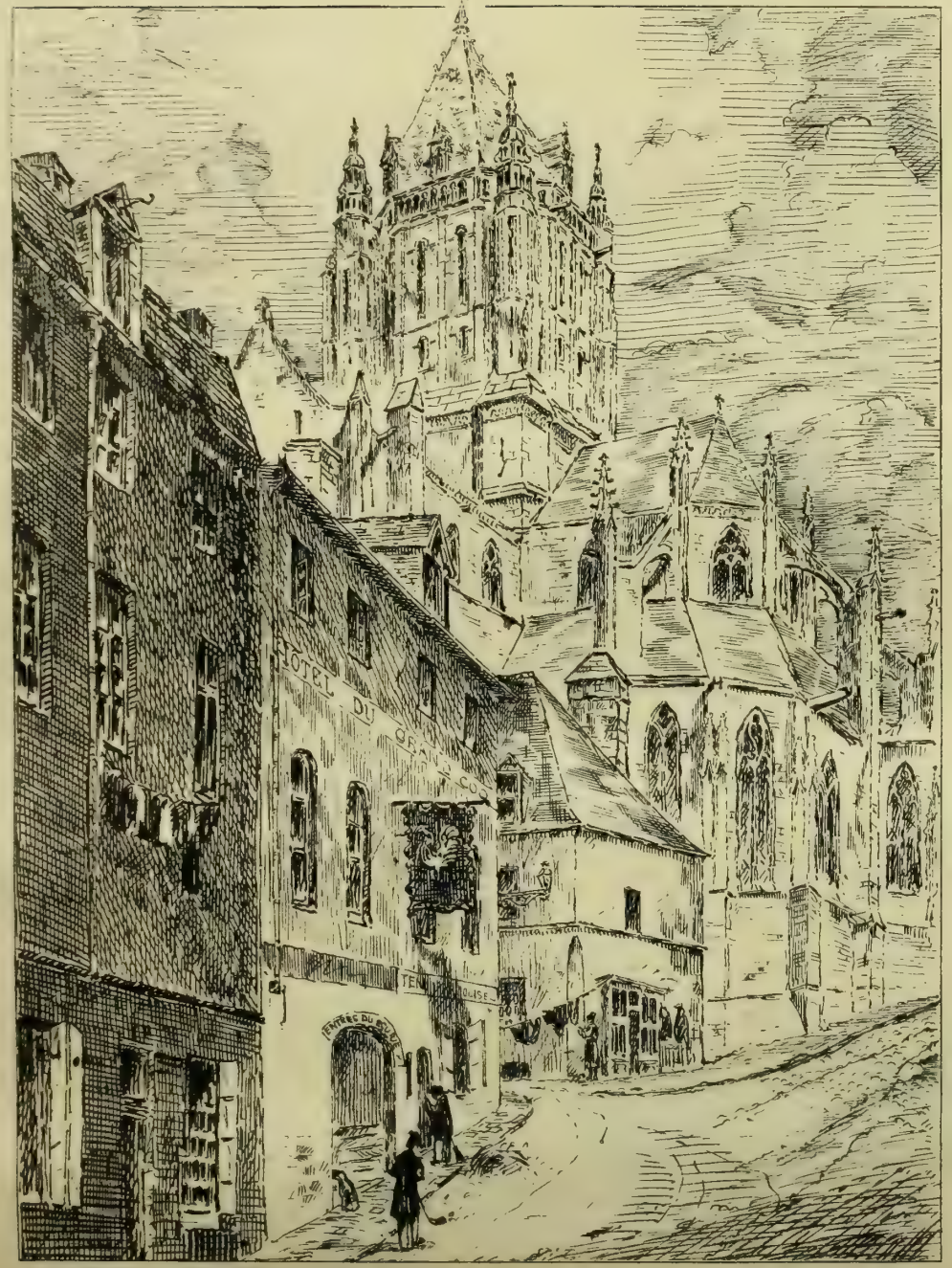

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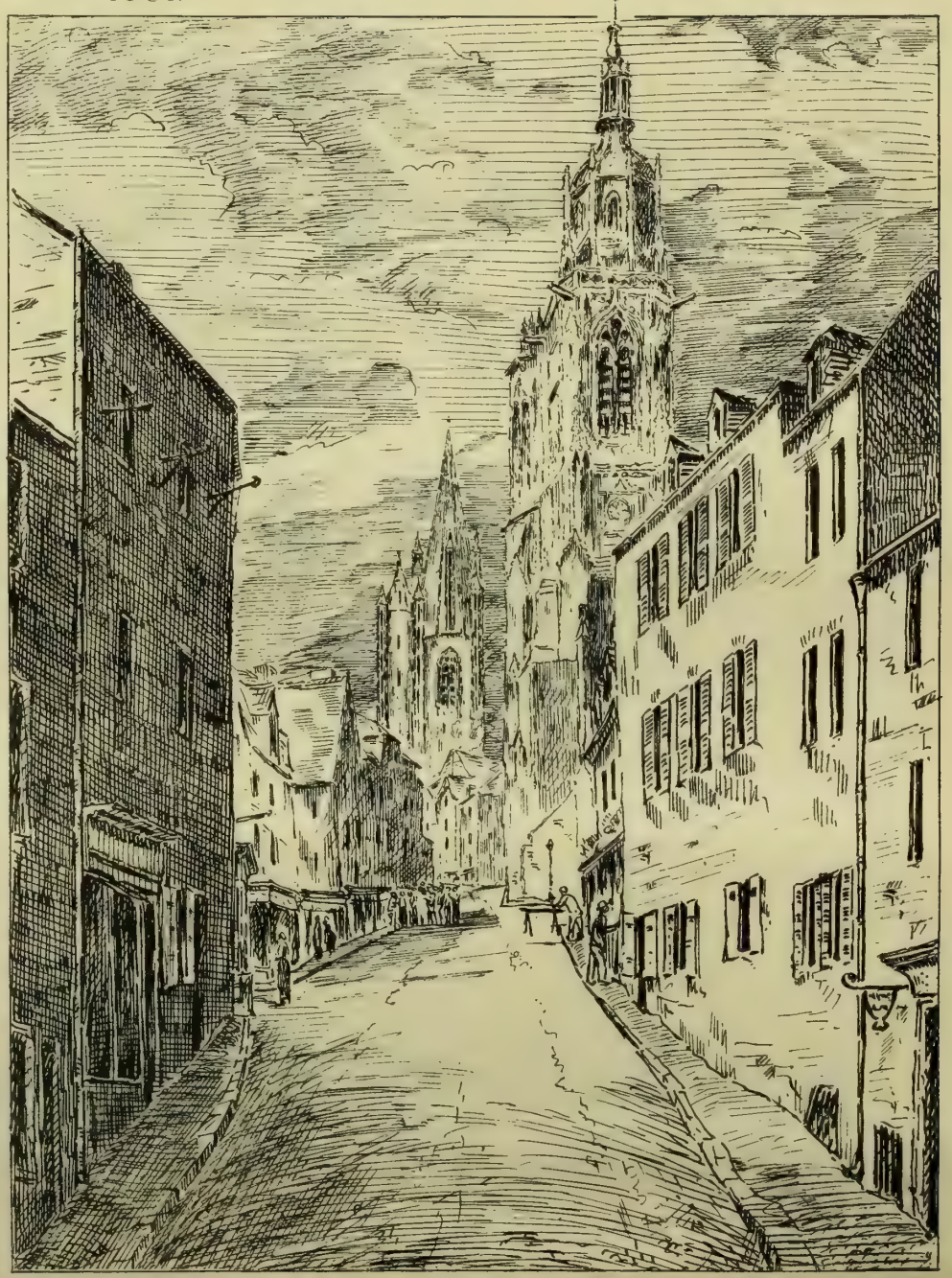

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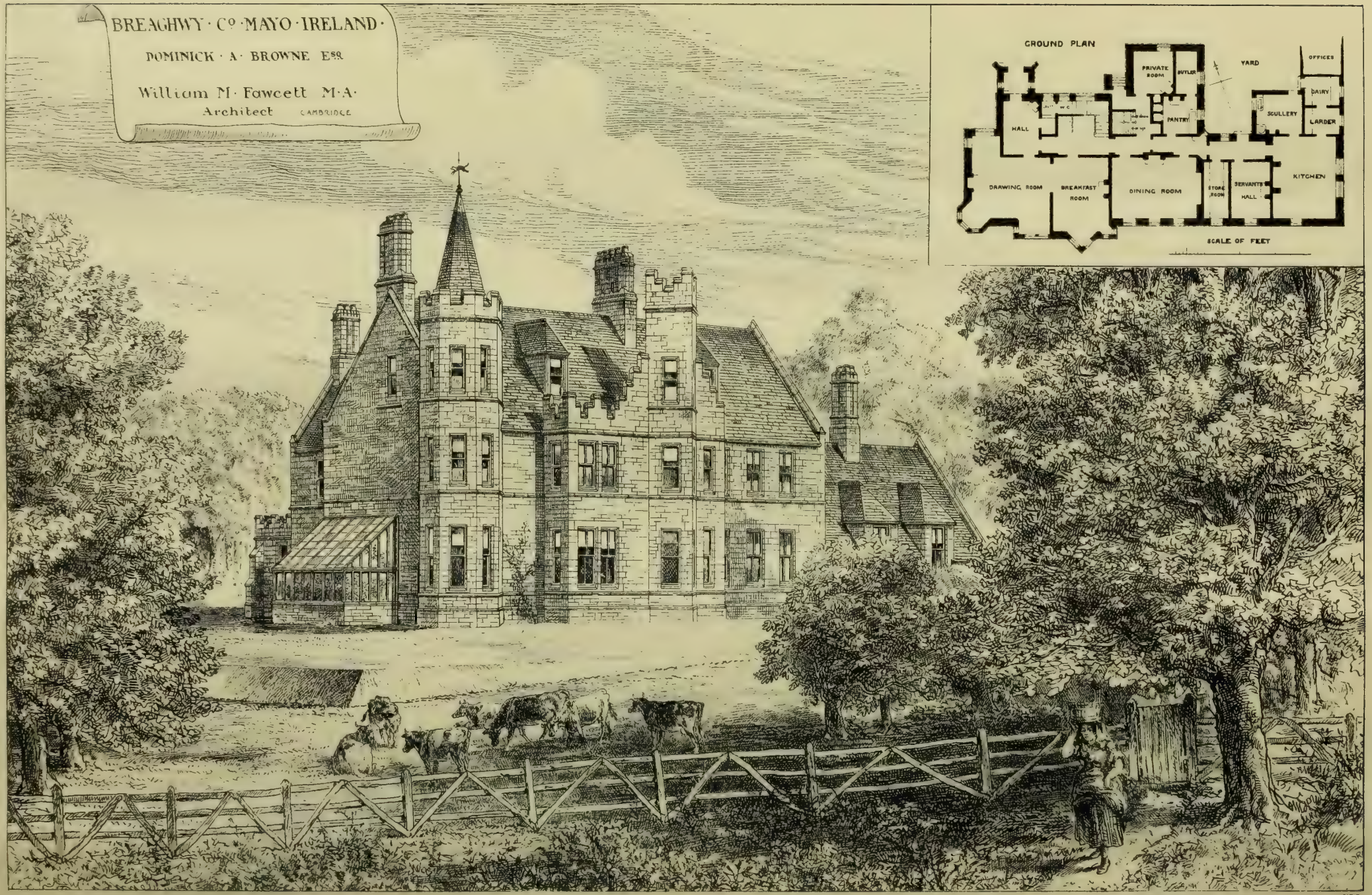
SKETCHES FROM COUTANCES

BREAGHWY · Co · MAYO · IRELAND ·

DOMINICK · A · BROWNE Esq.

William M · Fawcett M·A·

Architect CAMBRIDGE



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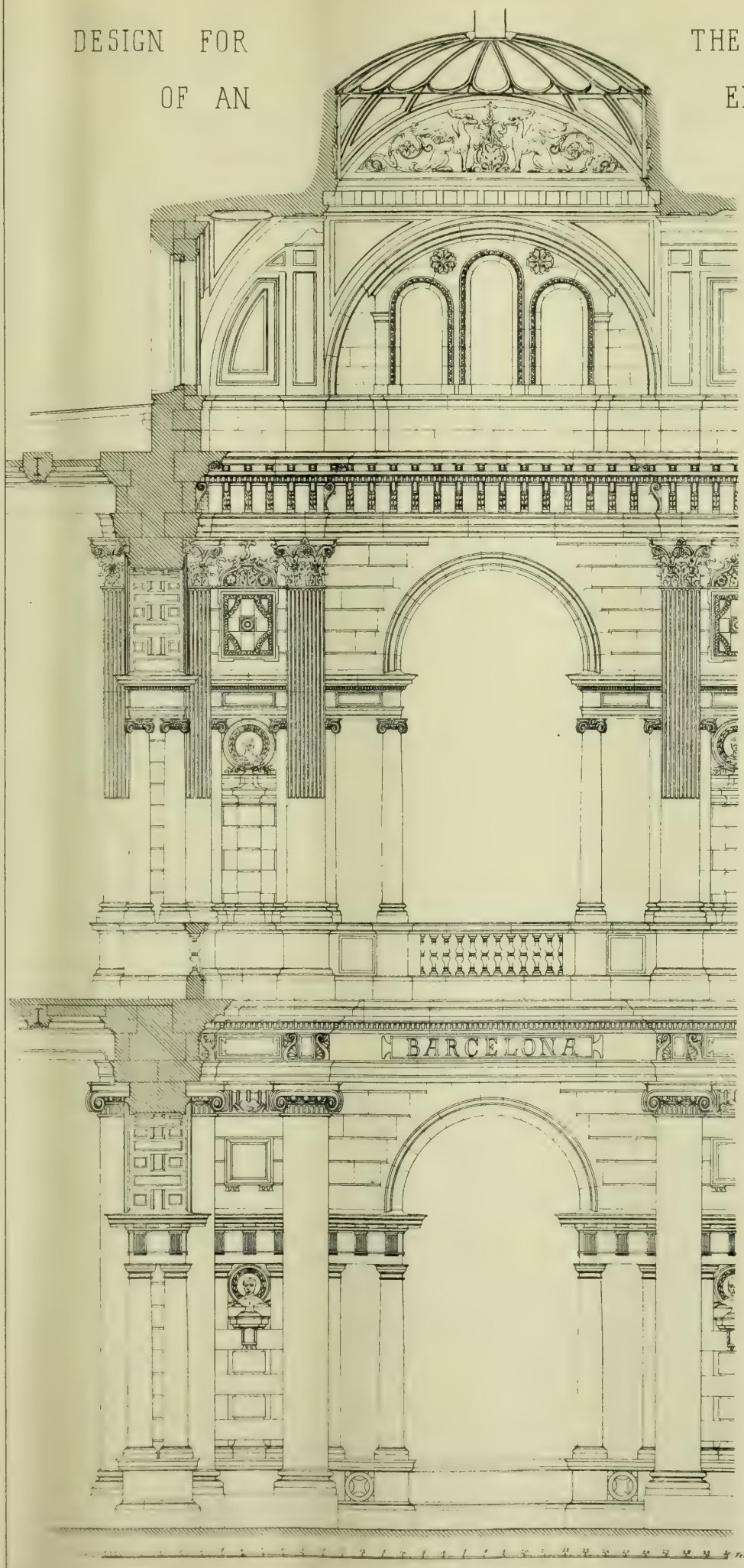
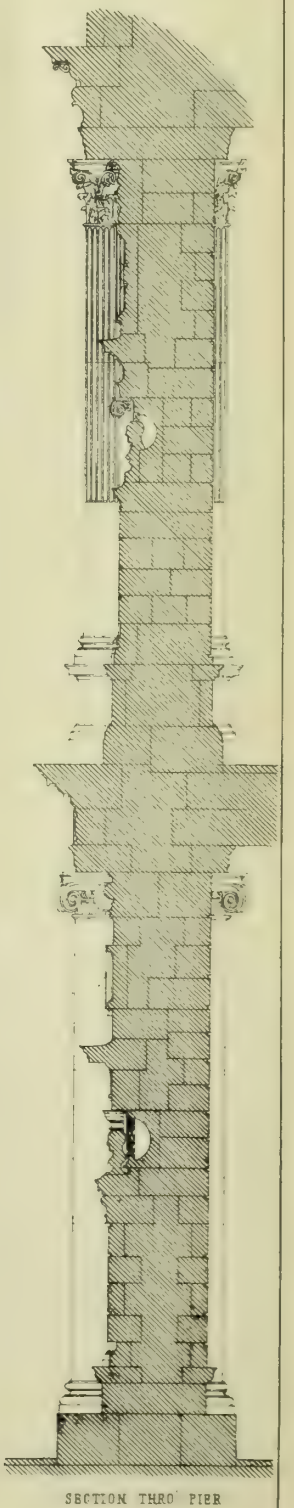
DESIGN FOR THE INTERIOR OF AN EXCHANGE

SELECTED DESIGN.





SECTION THRO' PIER

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R.I.B.A. SIR WILLIAM TITE'S PRIZE FOR 1881

Building Intelligence.

BAYSWATER.—On Saturday last the foundation-stone of the new church of St. Matthew, Bayswater, was laid. The building is of stone, after the designs of Mr. John Johnson, and the builders are Messrs. Dove Brothers. The style of architecture is Early English. The nave will be 100ft. long and 49ft. broad, with a range of 20 clerestory windows, 10 on each side. The entire length of the church will be 125ft., and the breadth, with nave and arcades, 70ft., and with the transepts, 90ft., accommodating about 1,500 persons. The height of the tower and spire, 200ft. The cost, including house and land for additional site, £24,000. It is hoped that the church will be opened for Divine service at Lady-day next.

CAMBRIDGE.—The foundation-stone of the first portion of Selwyn College was laid on Wednesday. The present section will accommodate 60 students, and has progressed as far as the joists of ground-floor. It will be 212ft. by 33ft., and 48ft. from ground to ridge of roof. The external facing is of red brick, with Ancaster-stone dressings. The external steps and the whole of the staircases, landings, corridors, and passages, will be of artificial stone. The roof will be boarded and felted, and covered with red Broseley tiles. There will be four floors; and the work is to be completed by March next. Mr. Arthur W. Blomfield, M.A., of London, is the architect, and Messrs. Horsman and Co., Wolverhampton, the builders; Mr. J. Browning, of London, is the clerk of the works, and Mr. Hopcroft is the builder's representative. The site cost £6,111 10s., and the buildings now in progress will cost £15,600. It is proposed to add hereafter a second block for 60 students, permanent chapel, hall, library, master's lodge, and kitchen.

ELY.—The new buildings of Ely Theological College were opened on Tuesday week. The college is Late Decorated in style, and consists of a chapel, lecture and dining-hall, library, principal's and vice-principal's studies, and twelve sets of rooms for students. The chapel is richly furnished by special gifts, and the sanctuary is decorated from designs by Mr. C. E. Kempe, who also executed the stained glass for one of the five windows. The east window is filled with stained glass representing "Christ Adored by the Angels and the Church-Workers in All Ages," and was executed by Messrs. Heaton, Butler, and Bayne, of Garrick-street, London. Mr. J. Piers St. Aubyn, of London, was the architect, and Messrs. Bardell Brothers, of Lynn, were the builders. A subscription portrait of the Bishop of Ely, representing him in a cope, has been painted by Guido Schmitt, and is to be hung in the college library.

GOVAN.—The new church being erected at the corner of White and Fairfield-streets, Govan, for the Greenfield U.P. congregation, has now so far approached completion that the memorial-stone was laid last Saturday. The plans have been prepared by Mr. T. L. Watson, 108, West Regent-street, Glasgow. They show accommodation for 600 persons, or, if galleries be introduced, for 800. Of the Gothic style, in one of its more simple types, the church is divided into nave and aisles, but it is without clerestory. Externally the walls are supported by buttresses; and the roof is surmounted by a belfry. There is also a hall, giving accommodation for 300 persons, together with session-house, vestry, &c. The contracts represent a total sum of £2,200. Including furniture, and everything required, the whole cost will not exceed £3,000.

HAVERFORDWEST.—The Bishop of St. David's reopened the parish-church of St. Thomas in the above town on the 2nd inst., after the addition of an aisle with organ-chamber and new vestry and porch on its north side. The following improvements and additions have also been made, the whole being in character with the rest of the church, which, with the exception of the fine tower and a small portion of the north wall of nave, was rebuilt about twenty-five years back. New chancel stalls and fronts, Communion-rail, prayer-desks, stone pulpit, chancel arch, east window filled with Munich glass by Mayer, Porritt's hot-air stove, encaustic tile pavements by Webb, of Worcester, and organ by Vowles and Sons, of Bristol. A large part of the churchyard has also been levelled and drained. The contractor was Mr. W. Reynolds, of Haverfordwest, and the architect, Mr. E. H. Lingen Barker, of London, Hereford, and Tenby.

KIRKDALE.—Kirkdale Church, North Yorkshire, after having been in the hands of the restorers since August last, was reopened on the 2nd inst. The erection of this church (which is dedicated to St. Gregory) is said to have been antecedent to the Norman Conquest. There is an inscription over the southern door of the church said to be Saxon, and to give indisputable proof of the antiquity claimed for the edifice. Briefly translated the inscription is—"Orm, Gamal's son, bought St. Gregory's Church, when it was all gone to ruin and fallen down; and he agreed with Maccan, to renew it from the ground to Christ and St. Gregory in Edward's days, the King; and Fosti, the Earl. This is a draught exhibiting the time of day, while the sun is passing to and from the winter solstice. Hawarth me made, and Brand the priest." Tosto or Tasti, the fourth son of Godwin, Earl of Kent, and brother of King Harold, was created Earl of Northumberland by Edward the Confessor, in the year 1056, and fell at the battle of Stamford Bridge in 1066. The restorations have been carried out from plans prepared by Mr. S. Crowther, architect, of Manchester, and they have been executed by Mr. Foggett, builder, of that city. The restoration of the chancel has cost about £600.

LUDLOW.—The new church of St. John the Evangelist, Ludlow, was consecrated on Friday, June 3, by the Lord Bishop of Hereford. The foundation-stone of the building was laid in August last, and the work has been completed most satisfactorily. The church is built in the Early English style, and consists of a nave, chancel, south aisle, vestry, and porch. Provision has been made for a future north aisle. The timbers in the roof are all of wrought and moulded pitch-pine. The walls of the church are built of native Pennant stone, with rock face, and square beds and joints. The external dressings are all of Box weather-stone, and the internal dressings of Corsham Down stone. The warming of the church is provided for by one of Porritt's underground stoves being fixed. The total cost of the church is about £4,000. Mr. A. W. Blomfield, M.A., London, was the architect, and Messrs. Wall and Hook, of Brimscombe, Gloucestershire, were the contractors; Mr. W. Day was foreman of the works.

QUINTON.—On Whit-Monday the memorial stones of Bourne College, which is being erected at Quinton, near Hales Owen, by a number of prominent Primitive Methodists, were laid. The plans have been prepared for a building to accommodate 120 scholars, but the portion now being erected will provide for 80 scholars only, thus allowing for future extension. The principal entrance will be by a clock-tower about 60ft. high, forming the central feature of the completed design, but terminating the portion of the buildings to be erected for present requirements. A school-room, dining-room, class-room, piano-rooms, a large chemical laboratory, lavatory, cloak-rooms, &c., will be upon the ground-floor, the first floor being devoted to three large dormitories, bath-rooms, lavatories, &c. The style will be Queen Anne, the walls being faced with pressed bricks, with stone and brick dressings. The builder is Mr. E. Walton, of Baldwin-street, Smethwick, whose contract is £3,700, and the building will be carried out under the superintendence of the architects, Messrs. D. Smith and Son, 40, Bennett's Hill, Birmingham, whose designs were selected in limited competition.

WEDMORE.—The church of St. Mary, Wedmore, Somerset, a fine specimen of Early Perpendicular work, was reopened on Wednesday week after restoration. The church consists of central tower, chancel, nave, aisles, and transepts, north and south chantries, and also a Lady-chapel of later date. The rough-cast coating has been removed from the exterior of the building, two windows and a doorway have been opened out in the porch, the old-fashioned high-backed pews, and the gallery which blocked up the noble west window have been removed, and the building reseated. In taking down the framing of the sounding-board over the pulpit, a fresco painting representing St. Christopher bearing the Child Jesus was re-bared. Mr. E. B. Ferrey, of Spring-gardens, London, was the architect, and Messrs. Merrick and Sons, of Glastonbury, were the builders; the cost has been about £3,000.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

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STUDENT. (Claridge's asphalte is the best. Write the Secretary, E. W. Farrell, Victoria Embankment, W.C. The variety you mention is in every way inferior.)

"BUILDING NEWS" DESIGNING CLUB.

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Correspondence.

SANITARY PLUMBING AND PLUMBERS' WORK.

To the Editor of the BUILDING NEWS.

SIR,—According to promise I now beg to offer you a continuation of my remarks on Mr. Hellyer's lectures on the above subject.

Firstly.—In preparing leaden pipes to make a joint, Mr. Hellyer should have told the "less initiated" that it is necessary to clean the ends before soiling them, as if the soil is put on a greasy part, it will not stand.

Secondly.—In gauging the shaving-lines, the shaving hook only should be used, held in the right hand and the forefinger placed against the end of the pipe; then either turn the pipe or pass the hand round the pipe. The fact of using compasses or such like contrivances proves the plumber not to be a skilled workman. A boy may be taught this simple method in a few days, and so save time throughout his life.

Thirdly.—In my last letter I said that Mr. H., in explaining the proper way to prepare a joint, had omitted something important. I left it to him to rectify this in his last lecture; but as he failed to do so, "I come to the rescue." No man can properly make a joint (that he can guarantee) without "touch." Touch is a tallow candle rubbed over the shaved part to keep it from tarnishing, and assist in the tinning. It is as well also to rub a little touch or tallow over

the joint as soon as it is made, which, at least, will prevent it from sweating when the solder is coarse.

Fourthly.—As regards tinning the ends of pipes before making a joint, I must suggest that ninety out of one hundred joints are tinned and wiped off at once in their places. Mr. Hellyer's advice is the method usually adopted when the pipes are in awkward places for *shaving*, and when allowed to stand for perhaps a matter of, say, twenty-four hours; then, as a matter of convenience, it is advisable to tin the ends before fixing.

Fifthly.—Solder, to judge the quality of which is one of the most important points for a plumber to learn as an essential item in the science and art of joint-making, is a matter that Mr. Hellyer has entirely evaded by saying it can always be bought—an opinion which experience teaches me is not to be relied upon.

Allow me to fill up this gap in Mr. Hellyer's lecture by explaining to the "less initiated" how to make and judge the quality of solder.

1. Good solder usually is composed of about two parts lead and one tin. Solder in these proportions, when poured out in thin strips on a dry stone, will "spot up."

2. If solder is too fine it will be found in working to hang to the cloth, look scratched, and drop off in teats round the bottom: in this case add a little more lead. (Sheet-lead is generally used, as pig-lead is not always at hand; and even if it were, it is often as impure as any other, though sold as A1. I am always satisfied with a few "joint hards;" but then "I'm such a little silly.")

3. If solder is too coarse it will work dry, and like so much sawdust, will set quickly, and break up in large lumps. A little more tin added, and well mixed, will rectify this.

4. If solder is burned, which not uncommonly occurs by its being made red-hot a time or two, by heating it too quickly or by the continual use of red-hot irons, it will look black when cold, silvery when hot, set quickly, and work short and rotten, though it will spot up as the good solder would. Time is money. Hurry often wastes time; for instance, solder is frequently burned and spoiled by being heated too quickly. It should be heated over a moderate fire, and, where practicable, coal used in preference to coke, as the latter burns the solder, and the sulphur excreted by the coke rapidly attacks the lead, even if the pot is covered, and so converts it to its original state—viz., galena or sulphuret of lead, more commonly known as ore of lead or lead ashes.

Solder kept continually over a coke fire, even at a moderate heat, will, so to speak, unmix itself; the tin will separate from the lead, rise and float on the top, and there, by the continuous heat, become impoverished and changed to what is called putty-powder, often miscalled dross or sulphuret of lead. This loss of tin in the solder renders it poor and porous.

For this last reason the iron should never be used excepting in case where it is absolutely impossible to do without it, and then only at a black heat. Our best plumbers, as also the Americans, I think, will agree with me on this point.

Zincky Solder.—That which is usually sold as fine solder often contains all kinds of base metals, and should not therefore be put into the pot for fining, as, should there be any zinc in it, it alters the working by causing the crystallisation to take place more quickly according to the quantity of zinc employed; of course, the shape of these crystals is not the same as those in solder proper.

Sixthly.—Overcast Joints, about which Mr. Hellyer seems to have a queer idea, and to think that they are a system only of bygone days, are not so obsolete as he asserts. They are as necessary as ever, and in many cases sound joints would not be made otherwise, for the following reason. There are still, in various parts of the country, pumps, the wells of which (not far from London) contain water that rapidly attacks the tin in the solder; it is therefore desirable to use as little in making your solder as possible, to make a durable joint. I have, in some cases of this description, had to make joints with solder five parts lead and one part tin, which would be necessarily very porous, unless well overcast.

Mr. Hellyer says that in Scotland the short joints only are used. This is radically wrong, as both are used there, and many good London plumbers use the short joint. From "tests" that I have seen of the long and short joints, I am certain they are equally strong if well made.

The solder-collar, or as Mr. H. says, "catcher," should be fixed by tying a piece of string underneath it, which will effectually prevent the waste of solder, whereas the method of using sand or sawdust will only result in dirtying the solder that is saved, so causing a waste of time in cleaning.

The tinning of flanges before wiping block-joints is unquestionably a great waste of valuable time, excepting under such circumstances as before mentioned. With regard to the tinning of brass-work, I think a little should have been said, it being most important, and not generally understood by young hands.

Why did not the lecturer instruct his audience in the art of making wiped-joints without the use of "metal-pot," ladle, or iron? Surely had he known of such a method, he would have explained it, seeing how useful it is where the above-mentioned tools are inaccessible?

Referring to this point, the chairman, at the conclusion of the lecture, was presented with the following letter, which, being read aloud, I was happily enabled to take down "à la Pitman."

To the Chairman of the Lectures on Plumbing.

SIR,—Mr. Hellyer having finished his description of joint-making, which we think incomplete for the following reasons, he has not described the method of making wiped joints without pot, ladle, or iron; we have, therefore, as a proof that this can be done, brought two such joints which were made in our shop this afternoon by the above method. These joints were made in the presence of Mr. Barnes and myself. Mr. P. J. Davies, thinking with us that this process not being in general use, it might be interesting to your audience, therefore we beg to submit them for examination.—We remain, yours faithfully, SMITH AND BARNES.

The method of making these joints is evidently but very little known, and when exhibited, were anxiously sought after for inspection by the majority of the plumbers present, some of them good old hands, resulting in a series of questions and suppositions as to how they could possibly be made. I cannot conclude my letter without thanking you on behalf of the A. S P. for your faithful reporting of these lectures, thereby showing your sincere interest in the welfare in the trade.

By the bye, in reply to Mr. Wright Clarke's letter, I think if he will take the trouble to re-read my first, that he will find he has in most instances endorsed my arguments. Mr. Buchan, in his letter, seems to imply that I and my works are unknown to the plumbing trade, and *especially to himself as a great sanitary authority*. Now, Mr. Buchan, you date your letter from Glasgow, in the library of which you will find my Blue Books of patents bearing the following numbers and dates:—1176 of 1871, 2838 of 1872, 1579 of 1873, 1179 of 1876, &c., made by J. Tylor and Sons, and even by men in your own town.

Is it possible that such a distinguished sanitarian as Mr. Buchan has never heard of any of these patents, which are used all over the world, nor read my articles on plumbing?—I am, &c.,

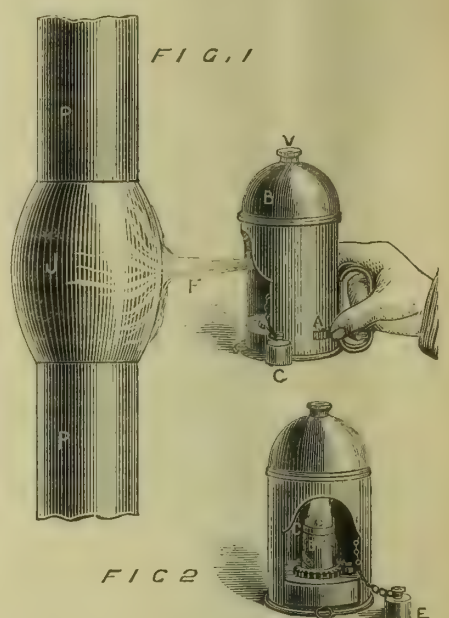
P. J. DAVIES, C.E.

PLUMBERS' JOINT-MAKING.—A NOVELTY.

SIR,—The following plan of joint-making being but little known to the general plumbing trade, may afford a few an insight to what was meant by my last letter, which speaks of making wiped joints without solder-pot, ladle, or iron.

You see that P P is the fixed pipe which may be either upright or horizontal; J the joint, shaped, F the flame of a lamp known as Cotton and Johnson's spirit-lamp. This lamp is made as follows:—B is a small boiler half filled with methylated spirit, under which is a small lamp. See Fig. 2, which may be regulated by turning the wheel A, Fig. 1.

Off the top part of the boiler a tube is taken down the back of the lamp, and its point bent to form a blow-pipe. The lamp being lit under the boiler soon causes the spirit to boil, thus generating a very inflammable gas which, on being checked at the end of tube, rushes out rapidly, and on being held against the joint or a piece of solder will melt it. The way to make this joint is as follows:—Take some plumbers' solder, run into a long strip, say 12 to 15in. long, ⅜in. thick, 1in. wide. Hold the lamp against the joint and get it hot enough to melt the solder which, of course, is done by putting the solder on in small portions. Keep at this constantly until you have sufficient on. You can almost shape the joint with this strip of solder. Having all the solder on you require,



keep your heat up by twisting or turning your lamp round the joint, then take a suitable cloth and make your joint in the usual way.

This, I think, will show that we Society plumbers have brought our light out from under the bushel, and a rather strong one, too. What says your friend, Clarke? I should remark that Messrs. Barnes and Smith are the gentlemen you may thank for this, as I am only a tool in the matter.—I am, &c.,

P. J. DAVIES, H.M., A.S.P.

SANITARY PLUMBING.

SIR,—In a letter appearing in your valuable paper from Mr. Clarke on sanitary plumbing he states that Mr. Hellyer is the first man who has given lectures on plumbing. As far as London is concerned this may be so; but when I was in Newcastle-on-Tyne, in 1858, serving my time at Messrs. R. and W. Hawthorne's, engineers, I attended a series of lectures which were delivered at the Literary and Philosophical Institute, on plumbing, explaining how necessary it was that theory and practice should be amalgamated. Mr. Clarke should make inquiries before making assertions. In other points he has contradicted himself, which he will see if he again reads his letter.

I beg leave to ask Mr. Buchan if a man is educated as a civil engineer and eventually becomes a plumber, is his first knowledge not to be made available for carrying out work? I contend that the double knowledge makes the best man; I only wish I had it.—I am, &c.,

J. MARGETSON, Engineer.

Barnes, June 6.

SPECIFICATIONS.

SIR,—The excellent article in your last issue on the subject of Specifications should provide for many an architect material for careful thought. The subject is one of very great importance, is the frequent cause of annoyance to the three parties immediately concerned, and often forms the groundwork for expensive litigation.

To my mind, a specification attached to a carefully-prepared set of drawings should, even in the absence of the architect, enable a clerk of the works, or a builder's foreman, possessed of ordinary capacity, to complete the whole of the intended works without a stoppage on account of want of further information; but this demands an application of knowledge and time which, at the present day, the average architect has not the power or the inclination to bestow.

The expressions you quote, such as "leave perfect to the satisfaction of the architect," very frequently form, as you justly observe, a large

percentage of the written words. It is not an uncommon occurrence to find half the carpenter's specification taken up by minute directions as to the exact place of growth of the timber, and the dire consequences if certain defects which are equally minutely described should be detected; but as probably not *every* architect would, on inspection, know it if by chance a piece of timber did *not* come from either of the specified places, or *did* contain many of the prescribed defects the builder ignores all this, looks for the scantlings of the floor or roof-timbers, does not find them, and goes on his way rejoicing.

Of course to write a good specification, apart from the practical knowledge which it demands, power of composition is an essential attribute; the difficulty of describing with terseness a complicated item, so as not to interfere with its lucid interpretation, and yet to contain some of the elements of polished composition, is sometimes very great; but rather than doubt as to exact meaning should arise, I think that the beauty of composition should give way to the exigencies of the builders' workshops.

Your article refers frequently to the bills of quantities as adjuncts to the drawings and specification; but the writer does not make it clear that the bills cannot be properly referred to unless they form part of the contract, because they become, when the works have been commenced, solely a matter between the builder and the quantity surveyor, and the architect should not be allowed access to them, unless they have been deposited as a schedule of prices, and then only at the final settlement of accounts. The disgraceful way in which architects have been known to take advantage of a knowledge of the prices in the bills before the completion of the works, should make builders very cautious in giving the architect the slightest knowledge of the contents of the quantities, unless they form part of the contract.

There is, as the writer of the article mentions, a growing tendency on the part of the architect to accord to the surveyor the privilege of writing the specification, and I am not prepared to say that such a course is not, on the whole, desirable, provided that attention is given by the architect to the fact that considerable additional labour is thrown upon the surveyor, for which he should be properly remunerated by allowing him *at least* his full commission, and not, as is sometimes the case, to give the surveyor a series of double lines with red colour between, interrupted by openings representing doors and windows, a section taken through a part of the structure showing nothing, instructions to write the specification when the quantities are completed, and when the commission for the work is received, to hand half over to the architect for his tremendous share in the labour.

When the surveyor does, however, write the specification, it is of great service to him to take his dimensions with *plenty of headings*, then to have a careful index of the dimensions made with the headings as far as may be under their respective trades, and proceed to write. It will sometimes save much time if rough notes are taken of the general disposition of the items, and I have sometimes found it well to take several sheets of paper, and with the dimensions in order, follow them through page by page, writing the trades as they occur, one and another, and then when the dimensions are exhausted put the whole together and page it. As you truly say, it is of the utmost importance that thicknesses and sizes should be carefully specified; it is of service to the builder to know the exact sizes of the doors in the joinery, because the intelligent workman can make a number of finishings from that 3ft. by 7in., or whatever it is. The sizes and weights of the various items of the plumbers' work are essential, and the widths of gutters, flashings, laps, turn-up, &c., as taken in the quantities, quite necessary to prevent dispute. The points where wastes and overflows are to discharge will be very useful also; and, as regards the door and window furniture, &c., considering that there are locks *and* locks, it is, I think, a good plan to give the p.c. value of all such articles, leaving them for selection by the architect; and adjustment, either in excess or diminution, at the settlement of accounts.

When the work is of any magnitude it secures a very great saving of writing if the sashes and doors are tabulated somewhat as follows—which I have just given at random from a specification:—

SASHES AND FRAMES, ETC.

Position.—Third story; back windows.

Frame and Sash.—Deal cased frames, oak sunk and weathered, sills grooved for iron tongue, and 2in. deal moulded sashes with moulded horns, double hung with patent lines, strong brass axle pulleys and iron weights.

Finishings.—1in. deal wrought framed mitred and splayed grounds 4½in. wide, 1in. tongued and staff-beaded linings and backings, 3in. by 1½in. architrave moulding, 1¼in. tongued and rounded window board, and bearers with notched and returned ends, and 1½in. by 1in. hollow moulding under, with returned ends.

Furniture.—Hopkinson's patent brass sash-fasteners.

Glass.—26oz. sheet-glass in squares as shown on drawing.

DOORS, &C.

Position.—On third story generally.

Door.—2in. deal four-panel, moulded both sides, 3ft. × 7ft.

Finishings.—1½ deal, double rebated and double beaded jamb linings and backings; 1in. framed, mitred and splayed grounds, 4½ft. wide, and 3 × 1¾ft. architrave moulding.

Furniture.—4in. butts, 7in. mortice locks, with white and gold furniture, two long and two short white and gold finger plates.

Glass.—When sash doors.

There can be but little doubt that to the deficiencies of the specification may be ascribed half the troubles which beset architects, and when, as is sometimes the case, the architect takes out his own quantities, and there is scarcely an item in the bills which will not bear at least three different interpretations, and when he, having written the bills, cannot, for the life of him, tell what they mean; and then, on that firm basis, he proceeds to write the specification, not two consecutive sentences of which are either grammatical or intelligible, who can wonder that difficulties arise? But the enterprising architect who desires to obtain a reputation for securing a cheap building, which has been so obtained partly at the expense of his employer, and partly at the expense of the builder, endeavours to—and, unfortunately, sometimes succeeds—protect his client from the consequences of this nefarious proceeding by inserting clauses in the conditions to the effect that whether the works required to complete the building are or are not shown on the drawings or described in the specification, the builder's tender is to be taken to include all such works in the same manner as if they had so been shown or described, and then finally shields himself under the no less questionable clause of making himself the sole arbitrator whose decision shall be final and binding on both parties; the secret of it all being that he is dishonest, or that he has not given the necessary time for a thorough exposition of all the necessary works. He is afraid of facing a severe client with an application to pay the builder the extras which are due, so he closes the matter with hundreds of pounds retained in the pockets of his client, and paid out of those of the builder; and even if he were properly anxious to do what is right, in the face of the contract he has framed, his legal-minded client will not allow him to certify for a shilling more than the contract carries, and so the builder goes to the wall.

But, Sir, builders have only themselves to blame if they are fools enough to sign any contract whatsoever which delegates to a necessarily prejudiced party, a decision from which they have scarcely an appeal, and if you take up the subject of Conditions of Contract, as you have intimated, I hope that you will caution builders against signing any contract which does not contain some such arbitration clause as that attached to the Conditions of Contract agreed to by the London Builders' Association and the Royal Institute of British Architects.—I am, &c.,

WM. WOODWARD.

BUILDING-STONES.

SIR,—Those who read your excellent publication with a view of learning something about the building stones of the country must be sorely puzzled at the variety of opinions expressed about them. As a West-Countryman who knows something about stones practically—who has had the working of various sorts of stone under his observation for many years—who has worked stone by his own hands, who has examined many ancient buildings in the counties of Dorset, Devon, and Somerset, to learn what he could about the stones of which they are built, I must say I am greatly astonished at what has been said about certain stones. If anyone with "half an eye" will take the trouble to examine with common care, and common sense, the different quarries in the West of England, and the principal ancient buildings in which the produce of the quarries is found, there cannot possibly be any difficulty in deciding which is the best and most durable stone for any important building. I will not venture to say which stone I know to be the best; but when I see a London architect get up a pamphlet to "whitewash" what is well known as the poorest building stone in substance and in appearance that can be got, one cannot but wonder at the meaning of it. "Beer-stone," says Mr. Masey, "for exterior purposes is better than many, and equal to any." (!) It is evident that this prophet was not asked to curse this stone. The absurdity of such a remark carries its own condemnation. It is stated that Exeter Cathedral was built of this chalk from Beer cliffs. I have not been able to look closely at the eastern part of this building, but I have examined the nave outside and inside. There is no Beer stone in the outside, unless it is decayed out of all shape and form. The principal parts of the building appear to be built of Caen stone of a yellowish colour, and some coarse-grained, very durable oolite of a very effective appearance. This coarse oolite is seen in all parts requiring great strength. It is found in the responds of the tower, in the windows and projecting seats to piers of arcades, ashlaring, &c. Mr. Masey speaks of inferior stonework of old buildings, as if it were usual to find it in a decayed state! This looks as if he had some interest in finding merits in the stone whether they exist or not. Mr. Masey is not content with praising the durability of this feeble stone—he flies in the face of Nature herself and blesses its colour! "Nature abhors a white," says an old writer on the picturesque. But this architect is not content with the expression of the most extraordinary opinions; he deals in prophecy, forgetful that it is not considered wise to do so "till you know."—I am, &c.,

A WEST-COUNTRYMAN.

SIR,—I was much surprised at the correspondence in your last issue respecting the building-stones proposed to be used in the construction of Truro Cathedral.

To many others who, like myself, have a practical and theoretical knowledge of most stones used for such purposes, this correspondence must be deprecated.

If there are not sufficient funds for carrying out a specific design in a hard species of stone, it appears to be clear enough that the design must be modified, or that a cheaper material must be substituted. It is all very well for interested persons to give their versions, and for amateur masons to air their very slight amount of knowledge of building-stones; but the fact remains that the harder and more costly stones to work will always be found the best weather stones, and this has been proved invariably.

A better proof that practical knowledge of these matters is positively necessary could not be given than Mr. Masey's description of Beer-stone. The only way of obtaining information about the various stones is by comparing them with each other. If a visit were paid to the Bath, Tisbury, Doulting, Portland, or Ancaster quarries, an account could be obtained from each and everyone just as glowing as the description of Beer stone. By the way, it must be a peculiar mode of arithmetic by which Mr. Masey proves the "cost of worked Portland stone to be four times the cost of worked Beer stone."—I am, &c.,

Putney. A MASON.

SIR,—I observe in the comparative table following the article on Beer stone in your issue of the 3rd inst., that the carrying weight of "best" Bath stone is stated to be 1·275lb. to the cube of one inch square.

The Corsham stone from my "Monks' Park quarry" was tested on the 30th August, 1880, by Mr. Kirkaldy, who gives as the results of his experiments a thrusting-stress of 2·927lb. to the square inch, being more than double the strength given by your contributor, Mr. Masey, and greatly in excess of Beer stone, with which it will also compare very favourably both in colour

and texture, the great feature being that in these qualities it is quite uniform throughout the quarry, and can be worked at a much less cost than Beer stone.

I could not allow the statement of Mr. Masey to pass uncorrected, as many may be misled by it; at the same time, I am inclined to imagine that the report from which the figures were quoted was specially selected as being the least favourable to Bath stone.

I inclose copy of results of Mr. Kirkaldy's tests.—I am, &c.,

Isaac Sumsion.

"MONKS' QUARRY," Isaac Sumsion, Proprietor.

Results of Experiments to ascertain the resistance to Thrusting Stress of three 6in. cubes of Stone received from Mr. Isaac Sumsion.

Test No.	Description.	Dimensions.	Base Area.	Cracked slightly.			Crushed, Steelyard dropped.		
				Stress.	Per Sq. in.	Per Sq. ft.	Stress.	Per Sq. in.	Per Sq. ft.
		Inches.	Sq. In.	Lbs.	Lbs.	Tons.	Lbs.	Lbs.	Tons.
3381	Corsham Bath Stone from the "Monks' Quarry."	5·85 6·00 by 6·00	36·00	108,400	3,011	193 6	118,150	3,281	210·9
3382		6·00 6 00 by 6·00	36·00	96,750	2,684	172·6	101,400	2,816	181·0
3383		5 98 6·00 by 6·00	36·00	84,450	2,345	150·8	96,640	2,684	172 6
			Mean	96,533	2,680	172·3	105,397	2,927	188·1

Bedded between pieces of pine ⅛in. thick.
David Kirkaldy, Testing Works, 99, Southwark-street, London, S.E., August 30th, 1880.

THE ROYAL ACADEMY.

Sir,—It is creditable to the new President of the Royal Academy that he should try to give some efficiency to the schools; but the whole organisation is so wrong that I see little hopes of an effective result. Consider the origin and action of the Academy itself, in first place. The Royal Academy charter was granted by a sovereign who had not a particle of taste for, or knowledge of, the fine arts. It was given as a personal favour to a second-rate artist who was esteemed simply because he painted religious subjects. This is the latest illustration of those mischievous patents which kings in former days were wont to grant favourites for exclusive trading, so benefiting the few by injury to the many, and a more injurious act than this, as regards art, could not have been perpetrated. Ostensibly intended to promote art, it has simply resulted in forming a privileged company of picture-sellers. It is to a great extent a trading monopoly, and with the natural result, that inferior productions are foisted on the public, whilst real talent works at disadvantage. So far from advancing art, it has the directly opposite influence. I will notice some of the effects.

The R. A. Exhibition becomes, in defiance of any rivalry, the great picture-mart of the season, and it is, therefore, a great effort with young or unknown men to get their works exhibited therein—a most serious matter to them. Unfortunately, merit does not insure admittance, though so much that is inferior is taken, and the blasted hopes, the distress and misery which result are sad indeed. I know a case of a talented artist in which lunacy and death resulted.

As regards the privileged members of this selected, but not select, company of "R.A.'s." However an artist may strive for excellence to enter this body, yet, once in, the need for effort no longer remains. His pictures sell as a matter of course under the magic influence of Royal authority!—the ignorant public imagining that what comes from an R.A. must be good. One may frequently hear at the Exhibition how the illusion affects people when, on consulting their catalogue, they find the work they meant to abuse is by an R.A. "Oh, that is by an Academician!" stops the mouth at once. The result of this is that effort soon ceases after admission, and instead of excellence, the pictures are positive eyesores. Then, again, men get into the Academy ranks to a great extent by interest; and from these two first named causes, one finds as R.A.'s such arrant duffers—let us speak truth for once—as C. Landseer, Ward, A. Cooper, Cope, Hart, Herbert, Redgrave, and Thornburn. This is not, unfortunately, a mere Academical matter. It is a national disgrace. How foreigners must wonder and scoff at such a fatuous production as the "Infant Samuel," exhibited by the Academy's late Professor of Painting.

The most recent example of favoritism is that of last week, creating general amazement in the architectural world. Earnest, self-respecting men, such as Butterfield, stand no chance of being admitted; they have too much independent feeling to submit themselves to the degradation imposed by the law of the Academy that men must propose themselves. A remarkable crew of small and vain people, I hear, they have on their books desirous of admission.

If the Academy is anything, it should be a place for instruction. It can teach in two ways, by its schools and by its exhibitions. As yet the teaching has been but very inefficient. During the whole time the Royal Academy has existed, what distinguished artist has it produced in painting, sculpture, or architecture? Not one! Nor is it likely to. At the age when students are admitted, and with the amount of proficiency required for admission, they can, if if they have really any *nous* in them, shift for themselves. As regards the painting students, they receive positive harm. Instead of trying their own powers of independent thought, they cramp their minds with copying, and so lose the power of original conception. The copies made are bought by dealers, and are palmed on the unwary as originals, so evil begets evil. If it is the wish of the Academy to develop latent talent, they should have free, perfectly free, elementary schools. The only way in which advanced students can be benefited is by individual artists—those who are artists—receiving such pupils into their studios, and letting them work out their own ideas there, under friendly and sociable direction. The sole idea in their annual and other exhibitions which the Academicians seem to have is money-grubbing. Considering that they received out of the public funds not short of £100,000 in the gift of Burlington House, they ought, in common fairness and honesty, make a return to the public, and this by making their exhibitions *free* some part of the time. The masses would thus get some teaching, such as is so freely accorded abroad. I doubt if it would much affect the receipts; but if it did, their income from this source is so great they could afford it. Their meanness in pocketing this money, which is secretly disposed of, is as surprising as it is disgusting. Considering that the works exhibited are, to a great extent, lent by outsiders, and, in the case of the Old Master Exhibitions, entirely lent, yet they give nothing to the public in return. The evenings, or certain days in the week, ought, I say, to be free. Their selfish meanness is strikingly shown by not admitting the outside exhibitors to their annual banquet and the day of private view, to which their patrons are exclusively invited, and with whom, I suppose, they fear to let their rivals come in contact.

The fact is the Royal Academy is a delusion, an imposture, and most pernicious evil, and people seem afraid to speak out. What absurd tenderness is shown to the works of the bad painters! If a writer publishes a foolish book, the critics are down at once on him, and the thing is torn to pieces, but equally well deserved and what might be beneficial punishment is never given to the stupid R.A.'s. It seems to be considered a sort of high treason to speak of them except with the greatest deference.

Much has been said about the vagaries of the hanging. Architecture is especially now in evil case. The R.A. architect, who is supposed to have the management of the architectural room, has a special craze about "scratched up" drawings. He is not himself a pictorial artist. He cannot draw a cloud, a tree, or a figure, consequently cannot make a picture, and so affects to despise pictorial effects. Coloured perspectives are therefore tabooed, and ink-sketches take their place; but even in the admission of ink-drawings the same mystery in selection is seen as throughout the exhibition. The effect of banishing the taking effects of water-colour is that the public frequent the gallery less than they used to, and how architects or the art is thus benefited I am at a loss to know.

In the matter of lectures it would be better if, instead (as with parsons and sermons) of original addresses—weak and puerile—the teachers read standard works to their audience. There is nothing new, and if the lectures were discontinued, no one but the lecturers would be the losers. If the prizes offered now restricted to the R.A. students were thrown open to all, some good might be done, for if the competition creates emulation, and is so far beneficial amongst the few, how much more might be effected if free to all?—I am &c., M.

THE RECENT ELECTION AT THE ROYAL ACADEMY.

Sir,—It has been a constant source of complaint that whatever walk of art they may follow, men of distinguished mark are passed over by the Royal Academy and others of less note are elected.

This seems to be particularly the case with regard to architecture.

With a Bodley, Webb, or Graham Jackson standing outside the door, one wonders upon what possible grounds the recent election can have been made.

It would be invidious to say much on this point; but it may be sufficient to observe that many persons outside the world of artists are in much amazement.—I am, &c., A. B.

IRTHLINGBOROUGH CHURCH, NORTHAMPTONSHIRE.

Sir,—A day or two since a friend sent me the Building News of May 20th, containing a notice of our reopening. From the same source I learn that in the Building News for June 25th, 1875, there was a drawing of our grand old tower. I shall be greatly obliged if you will kindly give me this opportunity of reminding those who are interested in such matters that the cracks and settlements of the masonry are rapidly bringing the whole structure to the point of falling. We, of the place, feel that we can fairly apply far and wide for help to repair or rebuild (as the case may require) our "campanile" with its unique Early Decorated lantern; on the double ground of having first exhausted our own resources in the most necessary repair of the church before going further afield, and also because the preservation of such a "pile" must naturally be of some interest with all those who have any affection for the grand and the antique.

I am afraid that it will be asking too much if I venture to request the reproduction of the illustration mentioned above. Any information will be given and any help received gladly by the churchwardens, Messrs. Lucas, Foster, and John Allen, or by your humble servant,

Thomas Grabham, Rector.

Irthlingborough, June 2.

COINS IN FOUNDATIONS OF SHIPS.

Sir,—It has long been customary, as stated on p. 661 in your last issue, to place a copper coin in the hole in a vessel's keel into which the mainmast is stepped.

A curious instance happened at a port on the Solway not long ago. In pulling to pieces a collier of unknown age, the customary coin was found in the keel, and turned out to be a first brass of Trajan! I don't suggest that the vessel was of Roman build, and that she had sailed the seas from the days of Trajan to those of Victoria; no, merely some shipwright of the last century had the coin, and thought it would be as lucky as a Georgian copper.

I reported the find to the Society of Antiquarians.—I am, &c.,

R. S. Ferguson, F.S.A.

New University Club, St. James's-sq., S.W.

"BUILDER AND ARCHITECT."

Sir,—Open confession is good. "P. C." last week only said publicly that which builders, great

and small, say privately, when it serves their pecuniary interest. Every builder I am acquainted with will offer to design, better than an architect, all the work he can obtain without contracting for, at least, to the extent of his capital; and I am acquainted with some builders whose attainments would not exempt them from the supervision of the School Board officers if their age did not. Would "P. C." like us to believe that builders "of standing" spend their own time in designing? Practically the architect becomes the paid servant instead of the superintendent of the contracter. Mammon has become supreme in too much of life's struggle; let us pray he may not in all.—I am, &c.,

COUNTRY ARCHITECT.

SIR,—There is nothing disgraceful in a man styling himself "builder and architect." So says our esteemed correspondent Hugh McLachlan. A little further on in his letter he laughs at the idea of a builder and architect styling himself undertaker also. He sees no objection whatever to builder and architect combined, but thinks that undertaker is a step too far. If this is the opinion of one in the profession (I believe I am right in saying of one not belonging to the provinces), may I ask your readers what are we coming to? As another set off to "M.," I might mention that I know of a man who not only practises as a builder and an architect, but he is also a manure-merchant and a Methodist parson. However, he is not an undertaker, so I suppose Hugh McLachlan will consider that he stands moderately well in the profession. Hugh McLachlan, in a former notice, says that probably "builder and architect" belongs to the provinces, and makes London an exception to the disreputable rule of combining the profession of an architect with the trade of a builder. Now, judging from the buildings which we see on every side of us in the London streets, generally whole rows of stuccoed houses sweeping round in graceful curves, or running in parallel straight lines, with their surfaces broken only by friezes and cornices multiplied by the thousand, and eggs and darts by the million, with occasionally a stray column or two propped up against the wall for no use, and certainly for no ornament, their very roofs being carefully concealed by an unbroken parapet, which forms an uncommonly picturesque skyline, broken only here and there by some ugly chimney-pot, or other invention contrived and patented by its ingenious architect, nominally to carry off the smoke, but really to torture the unlucky inhabitants of the house by suffocating them with smoke; it is certainly by no means an exception.

We constantly see advertisements in the papers asking "builders and others" to send in designs for contemplated buildings, the others respectfully meaning architects; and only a few days ago, in one of the architectural papers, I was reading a builder's circular (published for the benefit of the profession), headed "economy in building," in which the much-respected builder thanks his friends and customers for their liberal patronage during the last twenty years, and says that future orders intrusted to him will be treated in a practical and economical manner; after a few more sentences such as these, he finishes up with "Plans and specifications prepared promptly on moderate terms." Truly, what are we coming to? Is it not time that architects should, as a body, declare against such insults as these, which are daily hurled against their profession?—I am, &c.

W. M.

CHIPS.

At a general assembly of the Royal Academy held last week, Mr. George Aitchison, architect, was elected an Associate.

A first-class medal and diploma have been awarded at the Sydney Exhibition to the late firm of Tarring and Wilkinson, who have recently dissolved partnership, Mr. Tarring still carrying on business at the old offices, 69, Basinghall-street, and Mr. Wilkinson at 19, Furnival's Inn. The drawings for which the medal, &c., was awarded were Exterior of Chapel-street Church, Blackburn; Interior of Dr. Donald Fraser's Church, Marylebone; and Exterior of Messrs. Doulton's Studios, Lambeth.

The Brentford local board on Tuesday last elected Mr. F. W. Lacey their surveyor out of about 110 candidates. Mr. Lacey retains his practice outside the district.

A new church has been completed at Moylisker Meath, for Mrs. Tottenham, at a cost of £2,500. The architect was Mr. J. Rawson Carroll, F.R.I.B.A., of Dublin, and the works were carried out by Mr. Henry Sharpe, of Kells. The church is entirely built of light grey limestone from Mr. Sharpe's quarries.

We omitted to state in our article last week on the Westminster Panorama that the entrance is of Doulting stone, and that the material looks remarkably well.

Intercommunication.

QUESTIONS.

[6532.]—**Shop-Fronts.**—The writer would be pleased if any one would recommend a work on shop-fronts, and state price.—MOWBRAY VALE.

[6533.]—**Suffolk Bricks.**—Will any kind reader inform me which way they consider a Suffolk brick ought to be laid, whether frog upwards or downwards?—A TEN YEARS' SUBSCRIBER.

[6534.]—**Cleaning Whitewash from Portland Stone.**—Will any of your readers advise me as to the best means of cleansing Portland stone from whitewash? I have a church to restore, in which the wash has been used indiscriminately for ages. Can this be removed by other means than redressing? Does any one know anything about query 6503, in your issue of May 13th? Have looked in vain for reply.—TELUM.

[6535.]—**Flushing Side Sewers.**—Will some one kindly give me the benefit of their experience of flushing side sewers having a very slight fall? The sewers in question are in back streets (unmade), and only partially built on. There is a self-acting flushing apparatus, I believe. How does it work? The hose-pipe is not permitted to be used for this purpose. Sewers 9in. diameter. —M. P. B.

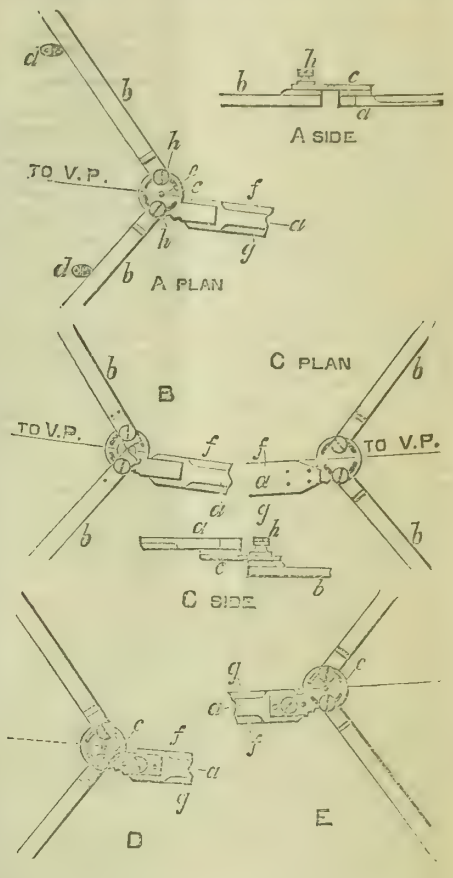
[6536.]—**Property of Architects' Design.**—Would any reader kindly tell me when a town corporation, after giving authority to an architect to give them a design, which he does, but is found too costly, determine not to carry out the design, pay the architect his commission on the drawings? Do the drawings then become the property of the Corporation, and must the architect part with them if required by the Corporation?—UNWILLING.

[6537.]—**Dry-Rot.**—The timber (pine) bottoms and sides of tuns containing beer, and also the wood joists carrying the said tuns, after 9 years' service, are much injured by dry-rot. Under the tuns is a beer cellar, where the beer ferments in barrels, giving a large amount of gas. Is the rotting of the timber due to this gas? The outside was painted over three coats, but it should be remembered that the tuns are constantly full of beer, saturating the timber to some extent. Is there any way of preserving the timber from these gases? What is the best kind of timber to employ in the renovation? What space should be left round the tuns for ventilation?—J. C. C.

[6538]—**Grates.**—I want to use some grates similar to those fixed in the later schools of the London School Board. Will some reader say whose they are?—PROVINCIAL.

REPLIES.

[6475.]—**Advantages of Centrolineads.**—I agree, and have agreed all along with "W. M." in his second answer, page 627, up to the clause commencing "On whichever." What I was disputing was the possibility of using one centrolinead easily for either the right hand or the left, and his description and diagrams have not assisted me. My pair of centrolineads are of modern invention, of Stanley's make, and similar to the two in "W. M.'s" diagrams A and B. His diagram A I have reproduced with slight additions, I call it that of a left-handed centrolinead. The following extract from Stanley's book on Instruments explains the construction (lettering being added to explain the diagrams): "The centrolinead consists of a long plain rule *a*, upon which are jointed two arms, *bb*, in such a manner that they may be set to any required angle. The two arms are first jointed together in the manner of a mechanic's twofold rule, having a pin or stud, *e*, projecting from the centre of the joint. This stud fits into the centre of the plate *c* which is carried over from one end of the long rule, thus rendering the rule and the two arms adjustable on one common axis. In the plate are two grooves or slots, concentric with the axis of the instrument. Through these grooves two milled head screws pass to the arms beneath, forming means of clamping them at any required angle to each other and to the rule." Following which is: "The plate described is connected upon the rule by a milled head-screw and steady pins." I will refer to this extract further on; for the present it will suffice that my pair of centrolineads have the plates fixed to the rules, "W. M." also neither shows such screw on his diagrams nor refers to it in any way, therefore I may suppose that his centrolinead has the plate fixed in the same manner, the plate forming a head to the rule. The arms work upon studs *dd*, and they have the inner edge of each inclined to the same common axis *e* as the edge *f* of the rule, these three edges being the true working lines of the whole, the edge *f* being directed to the vanishing-point as shown. The drawing edges *f* and *g* are on the upper side of the rule only. Simply reversing the arms according to the directions of "T. D." and "W. M." gives the result shown in diagram B; we have the edge *f* directed to the vanishing point and the stud at the joint of the arms fitted into the centre of the plate, but the instrument can neither be used from the right-hand in this manner, it being still left-handed, nor are my milled-head screws long enough to fit it together; I cannot therefore think this is what the two gentlemen mean. There are two ways, however, of using such an instrument as to have the edge *f* of the rule directed to the vanishing-point, but both are objectionable for drawing. One is to reverse the rule instead of the arms, and then placing it on the right hand it will present the appearance of diagram C, the side also being shown; now instead of the rule and arms lying flat upon the paper as shown in the side A, the rule is raised above the surface of the paper by the thickness of the arms and the three brass plates, truly, the rule being of ebony can be bent down to the paper, but the lines drawn have a good chance of being uneven, more especially as the ruling edge is underneath. The other method is simply to place the instrument on the right hand, when the proper ruling edge would be directed to the vanishing-point, the rule and arms would both be flat on the paper, but the rule would be between the light and the draughtsman, whilst the drawing pen would have to be reversed. I therefore concluded that such an instrument could not easily work right or left-hand and so called at Stanley's for further particulars. If the reader will now look back to my second extract from Stanley's work on Instruments he will find that in the single centrolinead the plate is connected to the rule by a milled-head screw and steady pins. It further states how the instrument can be used on both hands and first supposing it is ready for use on the left hand and it is wished to use it on the right, the book says "it would be necessary to



take out all the milled-head screws" (three) "and to turn the circular plate the reverse side upwards." When this has been done the instrument after refixing is ready for use on the right hand. I have shown the two positions with the screws and pins in D and E; D being for the left hand when the edge *f* is used for drawing the required lines, and E for the right-hand when the opposite edge *g* would be used. I was told at Stanley's that the centrolineads made for pairs are not reversible, only the single one with reversible plate. I was therefore wrong in the first part of my first reply when I said "two centrolineads are necessary if meant to work both from the right and left hands." "W. M." was wrong in every point of his answer in your issue of May 6. "E. C. T." I now believe to have been right, though by not giving explanations I misunderstood him about using the two edges of the rule. Two centrolineads are certainly useful when drawing perspectives of polygonal buildings and apses, in which cases there will be three, four, or even more vanishing-points on the horizontal line.—HUGH MCLACHLAN.

[6489.]—**Examination in Building Line and Architecture.**—Hugh McLachlan is in a muddle. Can he point to any building by a builder-architect of modern times that is—1, an artistic success; 2, that is constructionally sound (not scamped); 3, that has proved a financial success to client? I challenge him to produce any instance combining the first, and to the profession most important, of these requirements with the other two. —ROOS.

[6506.]—**Seventeenth-Century Work.**—"A Student" appears to have already looked up the best authorities for the information he requires, therefore he may consider that any gap left vacant by them is either not worth filling up, or that building, architecturally speaking, was at a standstill. He is, however, incorrect in saying "they all slip from Queen Elizabeth to Sir Christopher Wren." The greatest English Renaissance architect worked during part of that interval in the first half of the seventeenth century. I need hardly name Inigo Jones, architect to Charles I. He paid two visits to Rome and Italy for purposes of study. On his return after the first visit he appears to have worked in the Elizabethan style, many traces of the old Mediæval work still remaining; this is to be seen in some of the colleges at Oxford. After his second visit he never appears to have used any Gothic detail whatever, his work was thorough Renaissance in mass, detail and planning; specimens of which were carried out at Whitehall, Somerset House, Shaftesbury House, St. Paul's, Covent garden, and York Stairs, in London; also Wilton House, Coleshill, Berkshire, and at Greenwich in the country, most of which remain. In Gwilt's "Encyclopedia of Architecture" "A Student" will find matter relating to architecture of the seventeenth century. Inigo Jones outlived Charles I., and in the period of the Commonwealth it is stated in Gwilt "the history of architecture is a complete blank." Again, in the reign of Charles II., the year 1665 is

noted for the fearful plague, and the following year for the Great Fire, both in London; therefore during the years named by "A Student," activity in everything was to a great extent paralysed, and Sir C. Wren appears to have done little to the reconstruction of London till 1669, and what his style was is known to all. Therefore there are only 19 years to be accounted for between Inigo Jones carrying out Coleshill, Berkshire, in 1650, and Sir C. Wren's commencement of rebuilding in the City of London, and as the Commonwealth, the plague, and the Great Fire took place during these 19 years, there remains hardly anything to be explained. Webb was a pupil and nephew of Jones, whose daughter he married; he built a large seat for the Bromley family at Horseheath, Cambridgeshire, and added a portico to the Vine in Hampshire for Challoner Chute, the Speaker to Richard Cromwell's Parliament. Ambresbury, Wiltshire, was executed by him from the works of his master, and also the east side of Greenwich Hospital. Therefore some of these works were probably done during the years mentioned. Captain Winder, a Dutchman, was employed after the Restoration on Cliefden House, Bucks; the Duke of Newcastle's in Lincoln's Inn Fields, Combe Abbey, Warwickshire; Hempsted Marshall; and Buckingham House, St. James's Park, on the site of which now stands the Palace. The style of the period was, therefore, Renaissance, which towards the end of the century, became more debased and French. The term Carolvan has been used, but I consider it unadvisable to name a style after every monarch who reigns. The plan no more had the Elizabethan features in the hall of daïs, carved screen and minstrel gallery; the rooms were generally arranged symmetrically round a square hall and handsome staircase, they opened one into another forming suites, the general outline of the building being a square. The greatest part of this informat on is from Gwilt's work, in which "A Student" will also find the names of several other architects who lived in that century with their works, but without dates.—HUGH MCLACHLAN.

[6510.]—**Interest on Contract Sums.**—The builder can clearly not claim the interest from the client, since the latter keeps to his agreement in paying when the certificates are presented, and would even urge the surveyor to help the builder. I also do not think it would be advisable to claim from the surveyor, at any rate not in a court of law. Let him try the effect of keeping the surveyor without his money for a like period, or consult a solicitor.—HUGH MCLACHLAN.

[6510.]—**Interest on Contract Sums.**—The builder can bring an action against the client or employer if the conduct of surveyor has not been discreet or fair, and the builder is thereby a loser, or he can bring an action for the sums due to him for work done if the certificate has been withheld fraudulently or in collusion with employer, but there seems to be no precedent by which a contractor can claim interest on amount owing. Much would depend on the terms of the contract as to when the certificates were to be made, but the leading legal decisions show the above to be the rule. Evidence is necessary to establish a case of misconduct on the part of surveyor or of wilful neglect.—G. H. G.

[6518.]—**Local Surveyors' Powers.**—The surveyor has no power to reject plans. The authority can reject them if they are not in accordance with (*a*) the authority's by-laws; (*b*) in the absence of by-laws, with the Public Health Act, 1875. If an authority reject plans that are in accordance with either as above, then you may build and authority cannot interfere. In this case, as stated in the question, the authority was wrong.—EX-BOROUGH SURVEYOR.

[6520.]—**Cubing.**—FOR "Young Architect's" information, I may tell him the "cubing of a building" means taking its three cubical dimensions and multiplying them together. This cubing being performed, a price per foot is chosen, and the number of feet is multiplied by it. Of course, the price is the leading factor, and can be obtained by knowing the price per foot of other buildings of a similar class. A list of prices is given in Young's "Architectural Handbook," which are founded on experience of the cost of buildings of different classes. Thus for small villas the price per foot may be taken at from 7d. to 10d. Warehouses of plain character run to about 5d. to 6d. per foot. The prices are best arrived at by actual experience of the cost of buildings.—G. H. G.

[6522.]—**Bronze in London.**—In answer to Harry Hems, my experience is that bronze does not stand the smoky atmosphere of London. Look at the Landseer lions in Trafalgar-square, besides those painted green on Holborn Viaduct, and many other instances. The sulphurous acid of the atmosphere has the effect of corroding the metal and eating pin-holes in it.—G. H. G.

[6524.]—**Damp Wall.**—"M." might try Portland cement inside, and a good coating of the "Indestructable Paint Co.'s" solution outside, though if the bricks are porous these precautions will not avail much.—G. H. G.

[6529.]—**Road-Making.**—If the soil of the estate is loam or clay, the foundation of the road should be dug out to the proper level and formed for the usual layers of gravel. The surface-water may be carried off by a pipe-drain of 4 to 6in., which may discharge into the nearest sewer, or a large hole may be dug filled with coarse rubble down to the gravel, and the pipes led into this. For particulars of road-making, I may refer to "Roads and Streets," by H. Law and D. K. Clark, in Lockwood's series, where all particulars will be found in detail. The cost is 5s.—G. H. G.

The first section of the Banbury and Cheltenham Railway, that between Cheltenham and Bourton-on-the-Water, was opened for traffic on the 1st inst. The line is 16½ miles long, and includes a long viaduct and tunnel.

A memorial stained-glass window has just been placed at the east end of St. James's Church, Chorley, Lancashire. There are four lights occupied respectively by the subjects of the Nativity, the Baptism of our Lord, the Last Supper, and the Angel at the Tomb. The work has been carried out by Messrs. Ward and Hughes, of London.

WATER SUPPLY AND SANITARY MATTERS.

SHUSTOKE.—The important work which the Water Committee of the corporation of Birmingham are about to carry out at Shustoke, by the construction of two large storage reservoirs, was formally commenced on Saturday last. Mr. Grey is the engineer. The reservoirs are situated in the valley of the Bourne, about midway between Shustoke and Whitacre. The large reservoir, which begins about a quarter of a mile from Whitacre Station, runs up the valley for nearly a mile, and covers an area of about 90 acres, the smaller reservoir being at its eastern end, towards Shustoke, and having a surface-water area of 8 acres. The average depth of the large reservoir will be 17½ft., with a storage capacity equal to 400,000,000 gallons of water; and the average depth of the small reservoir will be 10½ft., and capable of containing 20,000,000 gallons. The height of the embankment at the Whitacre or western end of the large reservoir will be 29ft., and in the deepest portion of the reservoir there will be 23ft. of water. Alterations will be made to the stream near the old mill, so as to carry off the flood-water into a new channel without passing between the two reservoirs. The water of the Bourne will be first drawn into the smaller reservoir, which will receive all the suspended matter and impurities by deposition, and it will then flow into the main or storage reservoir for distribution, in conjunction with the water derived from the other sources of supply, over the town and district served by the corporation. The Bourne water is exceptionally free from impurities, and will afford an important addition to the present supply, which will then be absolutely secure against all contingencies that may arise. Messrs. Aird and Sons, of Lambeth, are the contractors for carrying out the work, which is to be finished in two years. The amount of their contract is £78,900; but the total cost of the work, which includes two new pumping engines at Whitacre and the erection of cottages and other buildings, will be about £125,000.

THE VYRNWY WATER SUPPLY FOR LIVERPOOL.—The town council of Liverpool received last week a return of the entire cost in connection with the Vyrnwy water scheme from the outset to the passing of the Act, including all Parliamentary and other expenses. The preliminary investigation cost £2,791, and the promotion of the Bill in Parliament £27,468, and the total cost of the Bill was £30,259. That amount includes certain payments to the River Severn Commissioners, by way of compensation, provided for in the Bill. The plans were submitted and approved of the following portions of the proposed new waterworks, and the Water Committee was authorised to procure tenders for the execution thereof:—(*a*) Drawings of a section of the pipe line extending from Hirnant to Parc Uchaf; (*b*) drawings of the proposed masonry embankment of the Vyrnwy reservoir.

WEST KIRBY.—The waterworks for Hoylake and West Kirby are approaching completion. The brick lining of the reservoir has yet to be finished, and a roof thrown over it; but already the main pipes are daily supplied from the well with a better quality of water than sojourners at Hoylake have hitherto been accustomed to. The well, when sunk to the depth of 200ft, yielded 75,000 gallons a day. It has since then been carried to the depth of 240ft., with a diameter of 8ft., and has now a yield of nearly 250,000 gallons. It was for a time intended to sink a 7in. bore-hole 15 ft. below the bottom of the well, but the present yield of water is so entirely adequate that the intention was abandoned. According to the original plan the reservoir was to have a capacity of 500,000 gallons, but it has been enlarged, and now is able to contain about a million gallons. The work has been carried out by Messrs. Smith and Pilkington, of Bacup, under the supervision of Mr. Charles H. Beloe, of Liverpool.

LEGAL INTELLIGENCE.

"EVANS V. CARTE."—Mr. F. C. Tudor writes from Raymond-buildings, Gray's Inn:—"In the report of the argument on the rule nisi for a new trial in this case it is stated, 'The architect's estimate on the plans and quantities was between £12,000 and £13,000.' This is calculated to prejudice Mr. Emden, the architect, in the action which he has pending against Mr. Carte, besides injuring his reputation generally. I am, therefore, sure you will allow me to point out that any estimate made by Mr. Emden was long before the plans and quantities were prepared, or even the site purchased. I believe there is no controversy on this point. For a mistake to be made in giving a rough estimate, supposing such were the case, is very different from making a considerable blunder after the plans, &c., have been prepared. The date of Mr. Emden's employment is in dispute, but it certainly was not in 1880."

STATUES, MEMORIALS, &c.

DOVER.—A drinking-fountain has recently been erected in Dover, in a prominent position, near the Priory railway-station, presented to the town, designed, and erected by Mr. H. Warren, monumental mason, of that place, the water-fittings being provided by the town.

STAINED GLASS.

LITTLE BRADLEY, WEST SUFFOLK.—The Stationers' Company have presented a three-light stained-glass window to Little Bradley church, in memory of John Daye, the printer of Foxe's "Book of Martyrs," and Master of their Company, 1580, who lies buried there. The subjects are St. Andrew, St. Stephen, and St. Paul, and the work has been carried out by Messrs. Heaton, Butler, and Bayne, of Garrick-street, Covent-garden, who also supplied the seven other stained-glass windows in the church.

NEWINGTON, S.E.—Mr. Charles Evans, of Fleet-street, has just filled the large east window of St. Andrew's church, Newington, with stained glass. The window consists of four lights and tracery, and the subjects introduced are "Christ Blessing Children," "Healing the Leper," the "Crucifixion," and "Resurrection." A wheel-window, divided into nine openings, forms part of the tracery, and in this is represented the "Majesty," surrounded by cherubs. In the other pieces of tracery, the "Agnus Dei," "Pelican in her Piety," and other emblems are introduced. The window, which is rich and harmonious in colour, is the gift of Mr. Jerman Nobes.

PUTNEY.—In the assembly-room of the new wing just added to the Royal Hospital for Incurables, Putney, have lately been erected six large stained-glass windows. Foliage of different designs form a border to the painted glass in the centres. The windows are from the studio of Mr. Charles Evans, of 61, Fleet-street, E.C.

CHIPS.

Walworth-road Baptist Chapel, Newington, S.E., was reopened on Sunday week, after renovation and redecoration. The stone façade of the chapel has been repaired and cleaned, and the interior of the chapel has been treated with colour; the walls are of neutral tints, the ceiling of grey fawn and pink, and the columns and pilasters are snow white, with gilded caps and bars. New cushions, carpets and umbrella stands have been provided. Mr. J. E. Sears was the architect, and Mr. William Sayers, of New Kent-road, carried out the works; the cost has been about £650.

Wickhambreux Church, Kent, has recently had new seating put to the nave of unvarnished pitch pine, made by Messrs. Knight, of Gloucester, from the designs of Mr. Ralph Nevill, F.S.A., of 12, South-square, Gray's Inn. New lamp brackets of wrought iron and other improvements have also been carried out.

A new church, dedicated to St. Anne, situated at Haughton-le-Dale, Denton, together with a vicarage is being erected at the sole cost of Mr. Joseph Sidebotham, F.S.A., of Bowdon, Cheshire, and is expected to be ready for consecration early in the ensuing autumn.

A stained-glass east window, executed by Messrs. Jones and Willis, of Birmingham and London, subject, "the Ascension of Our Blessed Lord," and executed by Mr. Thomas Buxton, of Chelmorton, to the glory of God and in memory of his son Richard, has been recently unveiled in Chelmorton Church. This interesting village church, dating, it is said, as far back as A.D. 1111, has lately been restored at a cost of about £2,000.

Tollymore Park, Castlewellan, Co. Down, the residence of the Earl of Roden, recently injured by fire, has been restored from the designs, and under the direction of Mr. J. Rawson Carroll, F.R.I.B.A., of Dublin. The contractors were Messrs. H. and J. Martin, of Belfast. The total cost, including a water supply with 200ft. pressure from a neighbouring mountain, was £5,000.

The restoration of the parish-church of Abbenhall, Micheldean, has just been intrusted to Mr. E. Henry Edwards, architect, of Bristol.

A Wesleyan chapel was opened last week at Pontardulias, from plans prepared by Mr. J. B. Morgan, architect, of Llanelly, the builder being Mr. Thomas Hughs, of Llanelly.

The new Torquay winter-garden was opened last week. The architects of the new iron and glass building are Mr. J. Watson, of Torquay, and Mr. W. Harvey, of Torquay and London; and the general building contract has been carried out by Mr. W. A. Goss, of Ellacombe, Torquay. The iron-work was supplied by Mr. J. Tildesley, of Willenhall, Staffordshire.

Our Office Table.

A PRIVATE investigation has been going on lately as to the condition of the drainage of the Oxford colleges, and the result has been to show that they are for the most part in a very bad condition. Christ Church is stated to be as bad as any, and official remonstrances are said to have been written to the Dean on the subject. The reform in this college alone is estimated to cost £10,000. It appears that many of the colleges, and even some of those in the High-street, are drained into cesspools with huge brick drains, and that only in some cases the over-flow of these cesspools passes out into the main sewerage, which was not very long ago carried out by the Corporation at a cost of more than £150,000. As in many other towns, the main drainage of Oxford has been well arranged, but no sufficient care has been taken to render the house-drainage perfect.

IT is understood that the cutting of the Isthmus of Corinth is soon to be commenced. Of all the works of this sort that are contemplated this is the least in difficulty and will be the least in its results. The distance to be cut through is not much more than four miles. The soil is limestone, costly to cut, but not the most costly of earthwork, and the average elevation of the Isthmus is considerably below 100ft. The result will be that vessels bound from Trieste or any ports of the Adriatic for Athens or Constantinople will be able to shorten their voyage by a good deal more than twenty-four hours. Greek and British vessels trading from Athens by Patros, the great currant port of the Morea, will also make use of the canal. It will relieve Athens to some extent from its present maritime position as a *cul de sac*, but it will not open any great highway such as did the Suez Canal, or such as may be opened by the Panama Canal, or by that long-contemplated ship canal from the navigable waters of the Garonne to the Mediterranean

IN connection with the triennial fair of the Massachusetts Charitable Mechanic Association, which is to be held in Boston, U.S.A., next September, it has been decided to organise a complete exhibition of building appliances, including materials of all kinds—stone, brick, marble, terra-cotta, and timber, limes and cements, paints and varnishes, roofing materials, glass, builders' hardware, mill-work, such as doors and blinds, mouldings and manufactured joinery, plumbing work and apparatus, with such examples of iron and glass construction as can be exhibited at a small scale; and comprising also decorations, stained glass, gas-fixtures, paper-hangings, tiles, steel and brass work, and other ornamental details of domestic architecture. Thirty thousand square feet of floor-space have been allotted to this department, and the indications are that it will be crowded with objects of interest. The credit of the plan for a special exhibition belongs in some measure to the Boston Society of Architects, various members of which have interested themselves for months in the endeavour to organise a technical museum for the use of architects and students, and welcomed the opportunity which the recurrence of the Charitable Mechanic Association's fair afforded for collecting temporarily a very large and instructive special display.

THE regulations for the Exhibition of Improved Heating and Smoke-preventing Appliances, which is to take place at South Kensington, have been published. The exhibition, which is promoted by a joint Committee of the National Health and the Kyrle Society, will be opened on the 24th October next, and will close on the 26th November. Prince Leopold, Duke of Albany, and the Duke of Westminster are the presidents of the Exhibition, and the work will be carried out by the influential committee whose proceedings in relation to smoke abatement have frequently been reported. The arcades of the Royal Horticultural Society, and some of the adjoining galleries belonging to the Royal Commissioners for the Exhibition of 1851, have been lent for the purposes of the Exhibition. Numerous money prizes and medals will be awarded for the best inventions and appliances for preventing smoke from boiler furnaces, domestic grates and ranges, and for improved fuels for household and manufacturers' use. Trial of apparatus will be made and reported upon, and public lectures by various scientific authorities will be delivered during the Exhibition upon the subjects of heat, fuel, &c., to promote the object.

PREPARATIONS have already been commenced for the Exhibition of Ecclesiastical Art that has of late years proved so interesting an adjunct to the Church Congress. It is to be opened at Newcastle-on-Tyne, on the 3rd, and closed on the 8th of October, and as many of the leading manufacturers have already decided to be represented, it may be expected that the Exhibition will equal, if not surpass, any of its predecessors. The loan department, which is always an important feature, will be an unusually large one, consisting of ancient church plate, mediæval silversmiths' work, embroidery, and similar objects, some well-known collectors having promised to contribute. A portion of the building will be placed at the disposal of the principal Church Societies for their publications, and a room will be provided for the use of the secretary or representative, who will be in constant attendance to give personal information and counsel to those interested in the work of the particular society. The Exhibition will include educational books and appliances of every description.

A LECTURE on the "Sanitary Condition of Dwellings" was delivered by Dr. Bristow, medical officer of health for Camberwell, at the vestry hall of that parish on Thursday week. The subject was divided into six parts—namely, water supply, drainage, removal of refuse, ventilation, cleanliness and repairing, and the keeping of animals. In reference to water supply, the lecturer expressed his conviction that the general practice of keeping it in cisterns and butts was fraught with danger to health. Not only had many cisterns direct pipe-contact with the house-drain, but all sorts of abominations decomposed in those which were open, and tenants did not sufficiently often cleanse them. He considered the best place for closets, drains, and pipes was outside the house, but accepting things as they were, he advised householders to see that they had thoroughly well-fitting traps and an abundant supply of water. For the removal of dust, the best plan was that adopted in Paris, where the dust was placed in a receptacle outside the house every morning and removed at once by the local authority; if this was impracticable in London, householders should have their dust removed as frequently as possible, and should use disinfectants freely in the dust-bins.

THE Council of the Society of Arts have just erected six new memorial tablets on houses which are of historic interest as having been occupied by celebrated men. The residence of an emperor, two statesmen, a philosopher, and two artists have been thus distinguished. These china plaques will now be found on the front of 15, Buckingham-street, Straud, where Peter the Great lived for a short time; on 25, Arlington-street, for many years the residence of the famous Prime Minister Sir Robert Walpole; on 14, Savile-row, where Sheridan lived; on 35, St. Martin's-street, Leicester-square, for some time Sir Isaac Newton's home; on 36, Castle-street, Oxford-street, where James Barry, the painter, received the statesman Burke; and on 30, Leicester-square, a new building occupied by Archbishop Tennison's School, which stands on the site of Hogarth's home.

THE Soirées of the Institute of Civil Engineers in the Grand Courts and Galleries of the South Kensington Museum are always successes, but the entertainment given by the President of the Institute of Civil Engineers last Friday evening was unusually brilliant and hospitable. The attendance was large, and some of the Central Courts were quite crowded. The guests were received in the Lord President's Court by Mr. and Mrs. Abernethy. In the Italian Court Kalozdy's Hungarian Band played various selections of popular operas and dance-music in a very spirited and charming style, which gave special vivacity to the entertainment.

THE Duke of Edinburgh, in response to the request of the Committee, has consented to become the patron of the International Medical and Sanitary Exhibition. The whole of the floor-space will be allotted this week, with the exception of a portion which the committee have decided to set apart for exhibiting the work of journeymen plumbers Under special regulations this work will be exhibited free of charge, and it will include the specimens of workmanship produced by the competition for the prizes in connection with the lectures on plumbing now being delivered at the Society of Arts. Plumbers wishing to exhibit should make early application for particulars to Mr. Mark Judge, at the Parkes Museum of Hygiene, University College, Gower-street. It should be stated that certificates of merit will be awarded.

THE contract for the extension of the harbour of Girvan has been obtained by Mr. Young, contractor, Edinburgh. Mr. Young has nearly completed the new docks at Ayr, and last week the steamer *Amethyst*, of Glasgow, landed two cargoes of working plant at Girvan, so that the harbour works will be commenced immediately. The engineer of the harbour is Mr. Kinapple, C.E., Greenock. A pier is to be carried out from the west side of the present harbour, and a breakwater on the north-east side, which completely covers the entrance of the harbour from north-east gales. In taking the harbour vessels and boats will enter directly before the sea from the north-east, which is the only dangerous one on this coast. The harbour when completed will very much resemble the harbour of Eyemouth, in Berwickshire, which was designed by the celebrated engineer Smeaton. Girvan, when the new harbour is completed, will be on the west what Eyemouth is on the opposite coast. The estimated cost of the harbour is £12,000.

A RAILWAY bridge of considerable dimensions was opened for traffic in Western India on the 16th ult. This was the new bridge designed by Sir John Hawkshaw to span the Nerbudda river at Broach, where it is about a mile wide. The bridge by which the Dombay, Baroda, and Central India Railway has hitherto carried over its traffic was built about 20 years ago, and has shown itself liable from time to time to be damaged by the river floods during the rainy season. Five years ago, 25 out of the 69 spans which constitute it were carried away by a flood, whereupon the directors of the line determined on building the one which has just been completed, and which has taken three years and a half to construct. The new bridge is 4,687ft. long, and the dimensions 14ft. wide and 15ft. 11in. high. The cost of the structure is one-third of a million sterling.

IN the studio of Mr. G. A. Rogers, 29, Maddox-street, is to be seen a wonderful example of wood-carving, by a French artist of repute, by the name of Démontreuil, who enjoyed the patronage of Louis XVI. and Marie Antoinette. The subject is a dead canary suspended by a piece of string tied to the foot, and fastened to a nail, and supposed to be hanging on a panel. The whole subject, including the panel, is carved out of one piece of pearwood. Nothing, certainly in the way of close imitation, lately seen in exhibitions can surpass this dexterous piece of carving; the modelling of the dead bird is perfect; but the extreme minuteness of the detail of every feather, the beak, and foot are rendered with an inimitable truth and delicacy which must excite the curiosity of everyone, and the admiration of those who look upon imitative excellence as a high quality in art. As a piece of workmanship it is unsurpassable. The bird was executed at Madrid for a cardinal, and it is said the artist lost his eyesight over this task.

A COLLECTION of water-colour drawings, by Mr. Ayscough Wilkinson, is now on view at Mr. Rogers' Gallery, 29, Maddox-street. The drawings are chiefly of marine subjects, though a few architectural studies are amongst them. The transparency of colouring and atmospheric effect which strike one in examining most of these drawings is due largely to the artist's power of working wet, which gives a degree of finish and clearness as well as atmosphere to be attained in no other way. The "Julian Alps from the Lido" and "Where the Sea-line and Cloud-land Meet" (9) are examples. The last is a marvel of soft grey sky and dexterously manipulated colour worked wet, yet producing a delicacy and finish and luminous clearness which no body-colouring could attain. The "Forum of Nerva," Rome (4), is a bold drawing worked with a full brush, transparent in the colouring and shadows; we also notice "A Red Sunset, Venice" (5), "Day-break near Venice," a clear and luminous sketch full of air and light; "Side Door, St Mark's"

(15), cleverly handled in the polished marble shafts; "A Grey Day at Venice," a well-toned study; "La Grande Rue, Dol, Brittany," "Riviera Pines," "Solitude," very effective in sky and sea; "Old Houses, Candebec, Normandy," and a few architectural subjects chiefly Venetian. "Palazzo Osmarino, Venice," is rather crude in drawing; but the "Piazzetta, Venice," is a well-drawn sketch, showing the work of Sansovino. We also notice sketches of buildings at Pisa (55), Frascati (34), the "Palazzo Cicogna, Venice" (50). The artist's forte is, however, in marine subjects and "Coming up with the Tide" (36), "The Beach, near Rottingdean," "Sunset, Venice," and a few others are masterly sketches remarkable for clear and incisive handling and transparency of tone. Some of the Italian drawings are framed in deep black ebonised frames, made in Rome, and, we think, help to throw up the light colouring in a more satisfactory manner than the usual gilt frame.

CHIPS.

The first public park for Wolverhampton was opened on Whit Monday, by the Mayor, in the presence of 20,000 persons. It has an area of about 50 acres, and has been leased from the Duke of Cleveland, for 65 years at £335 per annum, with the option of purchase. Eight acres are occupied by two connected ornamental lakes, spanned by a bridge, and about 40,000 shrubs and trees have been planted on the grounds. The total cost has been £15,000.

The local board of New Swindon resolved at their last meeting to increase the salary of their surveyor, Mr. Jolliffe, from £150 to £200 a year.

A line of tramways from Chester-square, Ashton-under-Lyne, to the Town-hall, Stalybridge, was officially inspected on Thursday, the 2nd inst., by Major-General Hutchinson, R.E., of the Board of Trade. The works have been carried out from the plans, and under the supervision, of Mr. J. H. Synde, engineer to the tramway company; Mr. Barker was the contractor for the rails, and Mr. Nuttall for the paving, and Mr. Jones the clerk of the works.

At vestry meetings held in the parishes of St. Paul, the Abbey, and Westport, Malmesbury, last week, it was unanimously decided to appoint a burial board and provide a cemetery for the use of the town.

The Surrey Tabernacle, Winsey-road, Newington, was reopened last week, after decoration in colour. Mr. William Sayer, of New Kent-road, executed the works, under the supervision of Messrs. Jarvis & Son, architects.

The employés of the firm of Lucas Brothers, contactors, London and Lowestoft, were entertained at dinner on Thursday week, at the Crystal Palace, and at a Lowestoft hotel, in celebration of the marriage of Mr. Chas. J. Lucas, eldest son of the head of the firm. Mr. J. L. Clemence, architect, presided over the Lowestoft dinner, to which 130 sat down.

MEETINGS FOR THE ENSUING WEEK.

TO-MORROW (SATURDAY). — Architectural Association. Visit to Greenwich Hospital. Members meet at entrance to Painted Hall, 3.30 p.m.
St. Paul's Ecclesiological Society. Visit to Berkhampstead, St. Peter and North-church. Leave Euston 1.55 p.m.

MONDAY.—Society of Engineers. 7.30 p.m.

TUESDAY.—King's College, Strand. "Greek Sculpture." By Dr. C. Waldstein. Lecture No. 4, 3.15 p.m.
National Health Society. "The Science and Art of Sanitary Plumbing." By S. Stevens Hellyer. Lecture No. 3, "Traps and Trap Ventilation." Society of Arts' room. 7.30 p.m.

WEDNESDAY.—National Health Society. "The Science and Art of Sanitary Plumbing." By S. Stevens Hellyer. Redelivery of Lecture No. 3. Society of Arts' room. 7 30 p.m.

THURSDAY.—Architectural Association Dinner. Criterion Restaurant. 7.30 p.m.
Society for the Fine Arts. "Light." By W. Cave Thomas. 8 p.m.

FRIDAY.—"Greek Sculpture." By Dr. C. Waldstein. Lecture No. 5. Students of King's College will meet at British Museum, 3.30 p.m.

Lamplough's Pyretic Saline is refreshing, most agreeable, and the preventive of FEVERS, BILIOUSNESS, SMALL POX, SKIN DISEASES, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill. *Use no substitute* —[ADVT.]

Holloway's Pills.—These famous Pills purify the blood, and act most powerfully, yet soothingly, on the liver, stomach, kidneys, and bowels, giving tone, energy, and vigour to the whole system. They are wonderfully efficacious in all ailments incidental to females, and, as a general family medicine, are unequalled.

Trade News.

WAGES MOVEMENTS.

BEITH, N.B.—The cabinet-makers of Beith, near Glasgow, are still on strike for a reduction of the hours of labour to 51 per week. Over 110 men have left the town and only a few now remain on the roll; the Glasgow employés have resolved to support the men in the struggle.

PAISLEY.—The operative masons of this burgh, both society and non-society men, united last week in a strike for an increase of wages from 6d. to 6½d. per hour, stating that the prospects of the trade have greatly improved. Some of the masters have conceded the demand, but a large number of men are still out.

GREENOCK.—The house-joiners applied on Tuesday week for an advance of 1d. per hour on the wages paid—6d. The Master Wrights' Mutual Association offered to give a halfpenny advance, and this has been accepted on the condition that if the advance to 7d. is granted in Glasgow, the men of Greenock will also demand it.

McLACHLAN & SONS, 35, St. James's street, S.W. Builders, Decorators, and House Painters. Designs and Estimates.
General Repairs and Alterations Executed. Experienced Workmen always in readiness, and sent to any part of the country.—[ADVT.]

Doulting Freestone and Ham Hill Stone of best quality. Prices, delivered at any part of the United Kingdom, given on application to
CHARLES TRASK,
Norton-sub-Hamdon, Ilminster, Somerset.
—[ADVT.]

BATH STONE.
BOX GROUND,
THE BEST FOR ALL EXTERNAL USE.
CORSHAM DOWN
CANNOT BE SURPASSED IN BEAUTY OF APPEARANCE FOR INTERIOR WORK.
PICTOR & SONS, BOX, WILTS.
(See trade advt. on p. XXV.) [ADVT.

TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender—it adds to the value of the information.

ABINGDON.—For alterations and additions to premises, Ock-street, for the "Beaconsfield Conservative Club." Mr. E. Dolby, architect:—
Williams, Abingdon (accepted) ... £210 0 0

ABINGDON.—For a new billiard-room, The Abbey, Abingdon, for J. T. Morland, Esq. Mr. E. Dolby, architect, Abingdon:—
Thatcher, Abingdon £320 0 0
Williams, Abingdon (accepted) ... 257 0 0

ABINGDON.—For making additions to a pair of villas, Marcham-rood, for Mr. Payne. Mr. E. Dolby, architect:—
Drew, Abingdon (accepted)... ... £548 5 0

ASCOT.—For additions to St. George's schools, for Rev. W. Sneyd Kynnersley. Messrs. Byrne and Crombie, 303, Strand, architects. Quantities by architects:—

Laing, D., London	£929	0 0
Abbot and Charman, Ascot ...	888	0 0
Woodbridge, Maidenhead	887	0 0
Oades, A. L. and Sons, Egham ...	885	0 0
Watson, Ascot (accepted)	720	0 0
Hunt, Gerrard's Cross	693	0 0

ASHTON-UNDER-LYNE.—For the erection of a villa residence near to the Manchester-road, Ashton-under-Lyne. Mr. J. H. Burton, Warrington-street, Ashton-under-Lyne, architect:—
Clayton, J., Denton (accepted).

BAKEWELL. — For the erection of a house in The Avenue, Bakewell, for Mr. R. Orme. Mr. G. E. Statham, Matlock-bridge, architect. Quantities by the architect:—

For mason, slater, and plasterer's work:—		
Toft Bros, Youlgreave	£1,148	6 0
Bramwell, J., Bakewell	1,069	10 0
Oakes, F. A. and E., Buxton ...	967	0 0
Beck, Matlock	927	13 0
Allsop, Bakewell	915	0 0
Walker and Sons, Wirksworth ...	912	0 0
Thompson and Stone, Bristol ...	905	0 0
Bridge, Matlock	900	0 0
Askew, Matlock (accepted)	891	0 0
Bramwell, H., Buxton	847	0 0
For joiner's, plumber's, &c., work:—		
Bramwell, W. and E., Bakewell ...	750	0 0
Thompson and Stone...	730	0 0
Walker and Sons	700	2 0
Robinson, Matlock	700	0 0
Askew	670	0 0
Beck	669	18 0
Pidcock and Bagshaw, Buxton ...	642	0 0
Statham, W., Matlock	630	0 0
Norman, F., Bakewell (accepted) ...	587	17 0
Wood, J., Matlock	545	0 0

Total of accepted tenders, £1,478 17s.

BLACKROCK.—For additions to the Friends' Meeting House, Blackrock, near Brighton. Messrs. Holford, Clayton, and Black, architects.
Patching and Son £113 0 0

BRIGHTON.—For new stabling, conservatory, &c., at The Hurst, Brighton. Messrs. Holford, Clayton and Black, 152, North-street, Brighton, architects:—

Garrett	£470	0 0
Barnes	454	0 0
Lockyer	450	0 0
Nurcombe	450	0 0
With certain omissions:—		
Garrett	400	0 0
Lockyer	395	0 0
Barnes	385	0 0
Nurcombe	377	0 0

BRIGHTON.—For new front, Kings-road, Brighton, but not including terra-cotta. Messrs. Holford, Clayton and Black, architects:—

Garrett	£748	0 0
For the terra-cotta only (rough estimate):—		
Cliff and Son	110	0 0
Edwards	80	0 0
Tamar Works	75	0 0
Johnson and Co...	35	10 0

BRIGHTON.—For decorative works, &c., at Albany Villas, Cliftonville. Messrs. Holford, Clayton and Black, architects:—
Newnham £101 0 0

BRIGHTON. — For new wine-cellar, 62, East-street, Brighton, for Mr. C. Fasold. Messrs. Holford, Clayton, and Black, architects:—

Barnes	£137	0 0
Patching and Son	127	0 0

BRIGHTON.—For new shop-front in pitch-pine, office fittings, &c., 108, Church-street, Brighton. Messrs. Holford, Clayton and Black, architects:—
Winn (accepted).

BRIGHTON.—For new entrance-gates, altering roadway, &c., 3, Wellington Villas, Brighton. Messrs. Holford, Clayton, and Black, architects:—

Barnes	£146	0 0
Lockyer	139	0 0

BROUGHTON ASTLEY. — For restoring and reseating the parish-church of Broughton Astley, Leicestershire. Mr. Wm. Bassett Smith, 10, John-street, Adelphi, architect:—

Harrold, J. and W....	£2,103	13 10
Fisher Brothers	1,792	14 6
Allen	1,673	0 0
Bromwich and Foster	1,585	0 0
Loveday	1,529	0 0
Edey and Wade	1,516	8 0
Young	1,475	0 0
Bland and Sons (accepted) ...	1,451	0 0

BURTON-ON-TRENT.—For additions and alterations to Guild-street Board School:—
Hodges, G. (accepted).

CAMBRIDGE.—For enlarging the board-room of the guardians of the poor for Cambridge:—

Bennett and Son	£113	19 0
Pate, J. L.	104	0 0
Turner, H.	87	0 0
Willimott, J.	79	10 0
Lowings and Banyard	76	0 0
Kidman, C.	73	19 0
Thoday and Son	70	0 0
Walton, F.	68	0 0
Newman, G. J., Cambridge (accepted)	63	10 0

COVES END, MAIDENHEAD.—For enlargement and additions to Congregational Chapel. Mr. Arthur Vernon, 26, Great George-street, Westminster, and High Wycombe, architect:—

Hunt	£849	0 0
Woodbridge	795	0 0
Lovell	745	0 0

GLASGOW. — For the execution of contracts Nos. 2 (boundary wall) and 4 (cells, offices, and police accommodation) in the erection of a new prison for Glasgow:—

	No. 2.	No. 4.
Meikle, J. and D., Newton, Ayr* ...	£7,000	£28,000

*Accepted.

GREYBURY, NEAR EDENBRIDGE, KENT.—For the erection of a church and schoolroom with boundary-walls, for Mr. J. T. Morton. Mr. S. W. Haughton, East Grinstead, architect. Quantities by the architect:—

Godley, J., East Grinstead ...	£1,804	0 0
Wallis, H., Lingfield	1,783	8 0
Penn, G. and F., Pembury ...	1,771	9 0
Waters, J., Forest-row	1,504	10 0
Vaughan, E., Maidstone	1,497	0 0
Charlwood Bros., East Grinstead*	1,461	15 0

*Accepted.

GRIMSBY.—For cleaning cesspools throughout the town, for the Grimsby town council;—
Hatfield and Ellis (accepted) ... £373 6 8

HIGHGATE.—For detached villa residence in the Broadlands-road, Highgate, for Mr. R. M. Turnbull. Mr. J. Clarke, architect. No quantities:—

Hunt, Smithfield	£3,840	0 0
Green, Clapton	2,980	0 0
King, Hornsey	2,490	0 0
Dupont, Colchester	2,255	0 0
Browne, Highgate	2,105	0 0
Richardson, J. O., Clapham* ...	2,050	0 0

*Accepted.

HIGH WYCOMBE.—For new wing, &c., to North Town School. Mr. Arthur Vernon, 26, Great George-street, Westminster, and High Wycombe, architect:—

Woodbridge	£750	0 0
Gibson	662	0 0
Taylor and Grist	660	0 0
Nash	625	0 0
Corby	595	10 0
Hunt	595	0 0
Loosley	579	11 6
Holland	572	0 0

HORNSEY.—For new roads, sewers, and surface-water drains, for the British Land Co. (Limited), on their estate at Hornsey. Mr. H. B. Michell, surveyor:—

Contract No. 1.

Keeble, Regents Park	£4,336	0	0
Bell, Wood Green	4,145	0	0
Killingback, Camden Town ...	4,100	0	0
Crockett, King's Cross	4,007	0	0
Acock, City	3,887	0	0
Krauss, Bristol	3,829	0	0
McKenzie, City	3,767	0	0
Harris, Camberwell...	3,725	0	0
Nowell and Robson, Kensington	3,710	0	0
Pizzey, Hornsey	3,677	0	0
Jackson, Leyton	3,555	0	0
Dunmore, Hornsey	3,547	0	0
Thompson and Son, Battersea ...	3,490	0	0
Wilson, Walthamstow	3,350	0	0
Peill, Bromley (accepted)	3,185	0	0

Contract No. 2.

Keeble, Regent's Park	2,672	0	0
Killingback, Camden Town ...	2,630	0	0
Bell, Wood Green	2,575	0	0
Harris, Camberwell...	2,500	0	0
Crockett, King's Cross	2,481	0	0
Wilson, Walthamstow	2,480	0	0
Pizzey, Hornsey	2,440	0	0
Nowell and Robson, Kensington	2,400	0	0
McKenzie, City	2,391	0	0
Acock, City	2,360	0	0
Thompson and Son, Battersea ...	2,350	0	0
Dunmore, Hornsey	2,329	0	0
Jackson, Leyton	2,222	0	0
Krauss, Bristol	2,216	0	0
Peill, Bromley (accepted)	2,170	0	0

IPSWICH.—For erecting a new warehouse in Princes-street, Ipswich, for Mr. W. Jolly, wholesale tea dealer and grocer. Mr. William Eade, Post Office-chambers, Ipswich, architect:—

Girling, Robert	£2,094	0	0
Whiting, B. W.	1,998	0	0
Jones, D. C. and Co.	1,950	0	0
Bennett, J. B. and F. (accepted)...	1,825	0	0

KENNINGTON.—For additions to the Art Schools at Kennington, for the Council of Technical Education. Quantities by Mr. G. R. Tasker. Mr. Ralph Nicholson, Westminster, architect;—

Peto Bros.	£1,091	0	0
Ansell	994	0	0
Bywater	987	0	0
Hobson	968	0	0
Clemence	945	0	0
Marsland (accepted)	915	0	0

LAMBETH. — For rebuilding the Rock of Gibraltar Tavern on the Lambeth Hayles estate, for Mr. T. W. Craddock (exclusive of all fittings). Quantities by Mr. Henry Smith. Messrs. Waring and Nicholson, architects;—

Mills, J. and H.	£3,330	0	0
Shurmur, W....	3,159	0	0
Downs, W.	2,876	0	0
Burman, H.	2,869	0	0
Simpson, W. L.	2,785	0	0
Canning and Mullins (accepted)...	2,769	0	0

LEYTONSTONE.—For schools at Leytonstone, Essex, for the guardians of the poor of the parish of Bethnal-green. Messrs. A. and C. Harston, architects. Quantities supplied:—

Crockett	£15,182	0	0
Richardson, J. O.	14,587	0	0
Kilby	14,489	0	0
Johnson	13,822	0	0
Shurmur	13,425	0	0
Shaw	13,094	0	0
Jones and Co.	12,976	0	0
Julian and Co.	12,850	0	0
Braid and Co.	12,750	0	0
Garrud	12,683	0	0
Jackson and Todd (accepted) ...	11,570	0	0

LIVERPOOL.—For works to roof of the Walker Art Gallery, for the City Council:—

Hardiker, J. (accepted).

LIVERPOOL.—For gas-fittings at the free library and museum, for the City Council;—

Bucknall, A. (accepted).

LONDON. — For rebuilding the "Rock of Gibraltar Tavern," St. George's-road. Messrs. Waring and Nicholson, architects:—

Mills	£3,330	0	0
Shurmur	3,159	0	0
Downs	2,876	0	0
Burman	2,869	0	0
Simpson	2,785	0	0
Canning and Mullins	2,769	0	0
Gill	2,747	0	0

LONDON.—For repairs, &c., to houses at Malden-crescent, Kentish Town, N.W., for Mr. J. W. Rowney. Messrs. Ebbetts and Cobb, Savoy House, 115, Strand, W.C:—

Perkins, R.	£165	13	0

LONDON.—For the superstructure of offices and shops, Gray's Inn-road, Holborn, for Mr. R. Ryall. Mr. G. Vickery, architect. Quantities supplied by Mr. H. H. Leonard:—

Crabb, G. (accepted).

MANSFIELD, NOTTS.—For two villas, for Mr. R. Barringer. Mr. T. Hartas, 26, King-street, Manchester, architect. Quantities by Mr. J. G. Petherick, B.A., 7, Langworthy-road, Pendleton;—

Greenwood, Mansfield £1,840 0 0
Accepted, subject to revision.

MATLOCK BATH.—For the erection of a refreshment-room in connection with the New Bath Hotel, for Mr. P. Hubberstey. Mr. G. E. Statham, Matlock-bridge, architect. Quantities by the architect:—

Walker and Sons, Wirksworth ...	£487	0	0
Knowles, Brackenfield	465	0	0
Axe, Bonsall	450	0	0
Farnsworth, W., Cromford	447	0	0
Robinson, Matlock	445	0	0
Statham, W., Matlock	430	0	0
Wood, J., Matlock	418	0	0
Fox, S., Wirksworth	417	0	0
Buxton and Son, Matlock	406	0	0
Bridge, Matlock	396	0	0
Beck, Matlock, (accepted)	387	0	0

MATLOCK-BRIDGE.—For the erection of two shops and residences at Matlock-bridge, for Mr. A. Coton. Mr. G. E. Statham, Matlock-bridge, architect. Quantities by the architect:—

For Mason, Slater, and Plasterer's work:—			
Beck, Matlock	£949	9	8
Askew, Matlock	927	4	0
Bridge, Matlock (accepted)	851	0	0
For Joiner's, Plumber's, &c., work:—			
Knowles, Matlock	961	0	0
Statham, Matlock	940	0	0
Robinson, Matlock	908	0	0
Wood, Matlock...	892	0	0
Bridge, Matlock	875	0	0
Beck, Matlock (accepted)	867	0	0

Total of accepted tenders, £1,718.

NORWICH.—For repairing Hellesdon-bridge, for the City Council:—

Hammond, G. (accepted) £100 0 0

NORWICH.—For executing works in the churchyard of St. George's, Colegate, for the City Council:—

Hammond, G. (accepted) £175 0 0

NORWICH.—For engineering and bakery works and heating chapel at the workhouse, for the Norwich board of guardians:—

Barnard, Bishop, and Barnards (accepted) £1,140 0 0

OLD WINDSOR.—For swimming-bath and covered playground for Beaumont College. Rev. F. Cassidy, rector, Messrs. Byrne and Crombie, 303, Strand, and Windsor, architects. Quantities supplied by architects;—

For brickwork and other trades, exclusive of machinery:—			
Oades and Sons, Egham (accepted) ...	£2,424	0	0
For engines, pulsometer, tanks, and piping:—			
The Pulsometer Company, Queen Victoria-street, London...	£1,365	0	0
For iron roofs, exclusive of other trades:—			
Davies Bros., and Co., Westminster* ...	£854	0	0
Total	£4,643	0	0

* Accepted.

Amended tenders for pulsometer, piping, and Otto gas-engine:—

Porter, Westminster	£1,110	0	0
Young, J. A. and Co., Westminster ...	985	0	0
Laing, D., 2, Duke-street	946	0	0
Pulsometer Co.	924	0	0

NOTTINGHAM.—For two villas, for Mr. J. Armitage. Mr. T. Hartas, 26, King-street, Manchester, architect. Quantities by Mr. J. G. Petherick, B A., 7, Langworthy-road. Pendleton:—

Bell and Son, Nottingham ... £1,570 0 0
Accepted, subject to revision.

PENGE, S.E.—For stabling, &c, for Mr. George Atkin. Mr. C. J. C. Pawley, 26, Moorgate-street, E.C., architect:—

Young, W., Penge (accepted).
[4 tenders received.]

RAINHAM.—For factory building and shaft at Rainham, Essex. Mr. G. Perry, architect. No quantities:—

Richardson, J. O.	£979	0	0
Philby	918	0	0
Crabb	895	0	0
Baxter	784	0	0

RASTRICK-BY-HALIFAX. — Accepted tenders for the erection of a new corn-mill at the Spout, Rastrick, for Mr. F. Sutcliffe. Mr. Rogerson, of Brighouse, architect:

Masonry:— Wm. Crowther, Rastrick.
Joinery:—T. Rayner, Rastrick.
Slating:—J. Wood, Rastrick.
Plumbing:—J. Lawson, Brighouse.
Ironwork:—J. Berry, Halifax.

SHEFFIELD.—For additional wing to Dr. Quin's residence, Woodville, Sheffield. Mr. J. P. Earle, architect:—

Rodley and Son, Sheffield	£205	0	0
Hirst Bros. Norton	167	0	0
Fordham, Sheffield (accepted) ...	150	0	0
Willows, Sheffield	148	0	0

STRATFORD.—For construction of 310ft. of river wall and landing stage at West Ham gasworks, Stratford. Mr. E. H. Thorman, engineer:—

Cox	£3,097	0	0
Wood Bros.	2,983	0	0
Mundy	2,469	0	0
Lawrance	2,348	0	0
Bangs	2,280	0	0
Gardner	2,200	0	0
Perry and Co. (accepted)	2,000	0	0

SWINDON.—For repairing Carlton-street, for the New Swindon Local Board. Mr. Jolliffe, surveyor:—

Phillips and Powell	£100	10	0
Wiltshire, G. (accepted)	94	15	0
Surveyor's estimate	93	7	6

WALLINGFORD.—For the erection of a new rectory house for the parish of St. Mary-le-More, for the Rev. C. A. Raymond. Mr. Edwin Dolby, Abingdon, architect. Quantities by the architect:—

	A.			B.		
Smallbone, Streatley	£2,246	0	0	£2,303	12	0
Dodd, Caversham	2,147	7	4	2,170	7	4
Brasher & Son, Wallingford ...	2,095	6	9	2,055	0	0
Holly and Butler, Nettlebed ...	2,078	0	0	2,061	0	0
Jones, T., Oxford	2,038	0	0	2,086	0	0
Silver and Sons, Maidenhead...	1,939	0	0	—		
Selby, T. Oxford	1,925	0	0	1,948	0	0
Kingerlee, T. H., Banbury ...	1,925	0	0	1,925	0	0
Wheeler, J., Wantage	1,818	3	1	1,868	3	1
Williams, E. Abingdon* ...	1,723	0	0	1,742	0	0

* Recommended for acceptance for A.

A if faced with grey headers; B if faced with yellow stocks.

WATERFORD.—Alterations to board-room, Waterford Union Workhouse. Mr. W. G. Doolin, B.E., Dublin, architect:—

Nolan, Waterford	£428	0	0
McCarthy and Drohan, Dungarvan	385	0	0
Flynn, T., Waterford (accepted) ...	380	0	0

WINDSOR.—Second tendering for revised plans of eleven cottages and recreation hall for employés of the Royal Tapestry Works, Old Windsor. Mr. H. Henry, director Messrs. Byrne and Crombie, 303, Strand, and Winds or architects. Quantities supplied by architects;—

Watson, Ascot	£4,794	0	0
Laing, D., London	4,445	0	0
Oades, A. L. and Sons, Egham ...	4,315	0	0
Woodbridge, Maidenhead ...	4,067	0	0
Norris, Sunningdale (accepted) ...	3,987	0	0

WINNIPEG, TORONTO.—For the construction of water-works at Winnipeg:—

Laidlaw and Son, Glasgow, N.B (accepted).

TURPIN,
22, QUEEN'S ROAD
BAYSWATER, LONDON, W.
MANUFACTURER OF
The Best and Cheapest

PARQUET FLOORINGS.
150,000 ft. super. in Stock, ready for Laying
RIGA INCH OAK FLOOR BOARDS,
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Immense Stock always ready for Laying.

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All Styles executed for the Trade at Special Rates. Skilled Artisans sent to all parts of the country.
Estimates and Designs on Application.

THIN PARQUET (Turpin's Patent). 5-16 inch thick, prepared on deal back laminations, equal in wear to inch Solid Parquet. Used for Veneering old existing deal floors, and is susceptible of removal at pleasure. See Construction.

ORNAMENTAL PARQUET.
DEAL BACKING

Wandsworth.—For the erection of a detached cottage in the Rusham-road, Nightingale-lane, Wandsworth Common, S.W., for Mr. J. H. Bartlett. Mr. Edward Witts, architect. Quantities supplied :—

	Estimate No. 1. Cottage.	Estimate No. 2. Plastering.	Total.
McLachlan and Sons ...	£1,800 0 0	[£120 0 0	£1,920 0 0
Newton	1,669 0 0	76 0 0	1,745 0 0
Stimpson and Co.	—	—	1,723 0 0
Smith, R. and E. (too late)	1,490 0 0	120 0 0	1,610 0 0
Bush	1,461 0 0	110 0 0	1,571 0 0
Gregory	1,384 0 0	99 0 0	1,483 0 0
Richardson	1,305 0 0	95 0 0	1,400 0 0
Johnson	1,291 2 3	91 2 8	1,382 4 11
Triggs...	1,215 0 0	80 0 0	1,295 0 0
Holloway	1,200 0 0	91 0 0	1,291 0 0

BEST BATH STONE.

Westwood Ground, Box Ground, Combe Down, Corsham Down, and Farleigh Down.

RANDELL, SAUNDERS, & CO., LIMITED,
CORSHAM, WILTS.

Bath Stone.—Every description and the best quality supplied direct from his own Quarries by

ISAAC SUMSION, NEWARK STREET, **BATH.**

Quarryman and Stone Merchant. Established 1791. Prices, delivered to any part, furnished on application. —[Advr.]

SALES BY AUCTION.

Kensington.—Freehold Building Site or Investment.—By Order of the Mortgagees.

MR. W. A. BLAKEMORE is instructed to SELL by AUCTION, at the Mart, Tokenhouse Yard, on MONDAY, June 13, 1881, at One for Two, TWO FREEHOLD DWELLING-HOUSES, Nos. 2 and 3, Duke's-lane, Church-street, with workshop in the rear, at present producing from old rents £102 per annum. The property possesses two frontages of 36 feet each, and contains about 2,280 super. feet, forming a most desirable freehold building site for the erection of model dwelling-houses, which are in great demand in the locality.—May be viewed, and particulars had of Messrs. Carr, Fulton, and Carr, Solicitors, 7, Vigo-street, Regent-street; at the Mart; and of the Auctioneer, 44, Salisbury-street, Strand.

Periodical Sale by Auction.—To Engineers, Ironmongers Builders, and Silversmiths.

MR. H. BOURN will SELL by AUCTION, for the Machinery and Hardware Exhibition and Agency (Limited), in the Auction Room in their extensive premises, 147, Queen Victoria-street, E.C., on THURSDAY, June 16th, 1881, at 1 o'clock precisely, nearly all without reserve, a large, varied, and genuine assortment of IRONMONGERY and MACHINERY, comprising a 10 H.-P. Vertical Engine, a large assortment of iron and gun-metal stop-valves, gun-metal gland-cocks, back-pre sure valves, water gauge mountings, steam gauges, steam whistles, lubricators and pet cocks, &c. Also a quantity of sheep shears, hammers, picks, shovels, claw hatchets, spanners, iron shaves, drawing knives, gimlets, augers, brass hooks, spirit levels, floor springs, and other carpenter's and cooper's tools. Cases of engineer's stocks and dies, ratchet braces, coach wrenches, pulley blocks, brass wire tube brushes, wire cages, ship's compasses, Clive's packing, Mineral Cog. packing, and indiarubber washers. A large assortment of electro-plate and pocket knives, small thrashing machines, ploughs, chain pumps, potatoe digger and potatoe dressing machines, wrought iron fire-proof safes, wrought iron tank, registered stoves (various), stone crusher, lathe, circular saw benches, mitring machines and fret-cutting machine, steam engines and boilers.—Catalogues may be obtained on application. The goods are now on view.

Highly important Freehold Building Land in Plots, Wandsworth Common, close to Trinity Church, Trinity-road, eight minutes from Wandsworth Common and Balham stations, to be SOLD by AUCTION by

MR. R. B. BRIGGS, at the Surrey Tavern, Wandsworth Common, on THURSDAY, June 16th, 1881, at seven o'clock in the evening precisely, seventy-two PLOTS of eligible FREEHOLD LAND, including one tavern plot and four shop plots. The land is admirably situated in an elevated position, being eight feet above the road on a bed of gravel. Excellent roads and sewers. There is a fine service of trains from the above stations to Victoria and London Bridge, and also constant communication with the City by omnibus, the distance being five miles from London Bridge. The property is laid out in 16ft. to 20ft. frontages, for which there is a great demand, and must grow considerably in value, situate as it is immediately between the two finest open spaces near London, which must for ever remain unbuilt upon. The easy terms of payment render this a most favourable opportunity for the acquisition of property by builders and others. Possession given upon payment of 10 per cent. per annum; payable by equal quarterly instalments extending over nine years. Conveyance free of expense given to purchasers willing to take the same as prepared by the solicitors to the vendors.—Plans and particulars of sale may be had of Messrs. Jones and Russ, Solicitors, 53, King William-street, E.C.; Mr. R. B. BRIGGS, 28, Budge row, E.C.; and of Mr. W. F. Penfold, Upper Tooting.

Shepherd's Bush.—Valuable Freehold Building Estate.

MESSRS. CHADWICK are instructed to SELL by AUCTION at the Mart, Tokenhouse-yard, E.C., on TUESDAY, 28th June, at 2 precisely, in one lot, six acres of exceedingly valuable FREEHOLD BUILDING LAND, free of land tax and tithes, most eligibly situate, having an important frontage of 350ft. to Uxbridge-road, and being close to the Uxbridge-road Station on the District Railway, and Shepherd's Bush Station on the Great Western and Metropolitan Railways, the tramway passing the land. The Estate is fully ripe for immediate development. Possession will be given on completion of the purchase. Particulars and Conditions of Sale, with plans, to be had of Messrs. Nickinson, Prall, and Nickinson, Solicitors, 51, Chancery-lane, W.C., at the Mart, and of the Auctioneers, 17, Parliament-street, S.W., and 34, St. Martin's-lane, W.C.

Building Land, York-road, Battersea.

MESSRS. CHADWICK are instructed by the Trustee to LET by AUCTION, at the Mart, on TUESDAY, June 28, at 2 o'clock precisely, in one lot, three acres of exceptional y valuable FREEHOLD BUILDING LAND, most eligibly situate, Falcon-lane, York-road, Battersea, having a commanding frontage, and being in the centre of that thickly-populated district, close to Battersea-park and York-road Station, and 5 minutes' walk from Clapham Junction Station. The tramway passes the land. Shop and small private dwellings are in great demand, and let in this situation before they are finished. A lease for 99 years will be granted direct from the freeholder. Particulars and Conditions, with plans, to be had of J. Fraser, Esq., Solicitor, 16, Furnival's Inn, at the Mart, and of the Auctioneers, 17, Parliament-street, Westminster, S.W., and 34, St. Martin's-lane, W.C.

Building Land, Clapham Junction, one minute's walk from the station, and fronting the main road.

MESSRS. CHADWICK are instructed to LET by AUCTION, at the Mart on TUESDAY, 28th June, four acres of highly valuable FREEHOLD BUILDING LAND, situate St. John's Hill, close to Clapham Junction Station, having an important frontage to the best part of the main road, immediately available for the erection of shops and dwelling-houses, which are in very great demand in this thickly-populated district. A lease will be granted direct from the freeholder for 99 years. Particulars, with plans and conditions of sale, had of Messrs. Warriner and Cross, Solicitors, 21, Great Winchester-street, E.C.; at the Mart, and of the Auctioneers, 17, Parliament-street, S.W., and 34, St. Martin's-lane, W.C.

To Builders, Building Material Dealers, and others.—Barking, Essex.

MR. W. H. COLLIER is instructed by the British Land Company (Limited) to SELL by AUCTION, on the premises, Westbury, on FRIDAY, June 17, at Twelve for One precisely, in Lots, a quantity of BUILDING MATERIALS, situate on the Estate of the British Land Company (Limited), known as Westbury, Rippleside, Barking, within five minutes' walk of Barking Station, on the London, Tilbury, and Southend Railway, comprising doors, window sashes and frames, beams, rafters, joists, floor-boards, about 70,000 bricks, a quantity of slate tiles, paving-stones, stone sinks, old iron, zinc, firewood, &c.—May be viewed the day previous and morning of sale, and catalogues obtained on the premises; of the Auctioneer at the Offices of the British Land Company (Limited), 25, Moorgate-street, London, E.C.

Properties.—Middlesex and Essex.

MR. W. H. COLLIER is instructed by the British Land Company (Limited), to offer by AUCTION the following eligible PROPERTIES, viz. :—

Haringey Park, near Hornsey station, Middlesex.—At the Queen's Head Tavern, Green-lanes, on MONDAY EVENING next, June 13, at Six for Seven o'clock, the first portion of the Hornsey Station Estate, comprising 81 lots of valuable FREEHOLD BUILDING LAND, having important frontages to Tottenham-lane, the high road from Green-lanes to Hornsey, to the new road to be called Wightman-road, being the intended new approach from Tottenham-lane to Hornsey-station, and to the new road called Sydney-road, leading therefrom, situate close to Hornsey-station on the Great Northern Railway, and a few minutes' walk from West-green and Gre n lanes stations on the Great Eastern Railway, affording frequent communication to the City and West-end. The sites in Tottenham-lane and Wightman-road are set aside for the erection of shop property, and in a few years' time will form the market place for the whole of Hornsey district; there is good drainage and water-supply.

Finchley (East-end), Middlesex.—At the Bald-faced Stag, East-end, Finchley, on TUESDAY, June 14, at six for seven, 100 Lots of eligible FREEHOLD BUILDING LAND, being a further portion of the Park Hall Estate, having frontages to the High Barnet-road and Huntingdon and Durham roads, the new roads leading therefrom to Fortis Green-road, situate within three minutes' walk of East-end Station, on the High Barnet branch of the Great Northern Railway, from whence there are frequent trains to the City.

Barking, Essex.—At the Spotted Dog, Barking, on THURSDAY, June 16, at six for seven in the evening, the very desirable FREEHOLD PROPERTY, situate at Rippleside, Barking, within five minutes' walk of Barking Railway Station, comprising a five-roomed cottage, with excellent stabling, farm-buildings, and about an acre of land, having a frontage to Rippleside-road of about 100ft. Also 50 Lots of eligible Building Land, with frontages to Rippleside-road and Westbury-road, the new road leading therefrom.

Stratford New Town, Essex.—At the Swan Hotel, Broadway, Stratford, on THURSDAY, June 23, at six for seven in the evening, 100 lots of valuable FREEHOLD BUILDING LAND, with frontages to the Leyton High-road and the new roads leading therefrom, situate adjoining Leyton Station on the Great Eastern Railway, and 20 minutes' ride of the City to Liverpool-street or Fenchurch-street, being the first portion of the Leyton Station Estate.

The properties will be sold free from tithe and land-tax The purchase-money may be paid by a deposit of 10 per cent., and the balance can remain on mortgage or contract at 5 per cent. interest, to be paid in nine years by equal half-yearly instalments; but the whole or any part of the balance may be paid off at any time without notice. Free conveyances will be given on the vendor's title being accepted.—Particulars, plans, and conditions of sale may be obtained about ten days previous to each sale, at the principal Inns in the neighbourhoods; of Messrs. R. and A. Russell, Solicitors, 59, Coleman-street, E.C.; of the Auctioneer; at the Offices of the British Land Company (Limited), 25, Moorgate-street, London, E.C.; and at the places of sale.

Fulham.—Freehold Building Land, on the Salisbury Park Estate, about three miles from Hyde Park Corner, and within a short distance of Walham and Turnham-green Stations on the Metropolitan District Railway.

MESSRS. HARMAN & MATTHEWS have received instructions to SELL by AUCTION, at the Windsor Castle Hotel, King-street, Hammersmith, on TUESDAY, June 14, 1881, at 7 o'clock precisely in the evening, in numerous lots, five acres of FREEHOLD BUILDING LAND, having frontages of 2,780 feet to Munster and Varna roads, and to the continuation of Sherbrooke road and Rosaline-road, which are about to be formed through the estate. This land is situate in the midst of a thickly-populated neighbourhood, and is very easily accessible by rail or omnibus from either the City or West-end, and is eminently suitable for the immediate erection of shops or moderate sized villa residences, for which there is a great demand. Payment may be made by instalments spread over nine years, with interest at 5 per cent. on balance only. Immediate possession for building purposes. The subsoil is a fine gravel.—Particulars and conditions of sale, with plans, may be obtained of Messrs. G. F. Hudson, Matthews, and Co., Solicitors, 23, Bucklersbury, E.C.; at the place of sale; and of the Auctioneers, 35, Walbrook, E.C.

Tooting, Surrey.—The Clarendon Estate.—Charming Freehold Building Sites for Villa Residences, within three minutes' walk of Tooting Junction, the Church, and the Common.

MR. RICHARD J. COLLIER is instructed to offer for SALE by AUCTION, at the Mitre Hotel, Tooting, on MONDAY, June 13, at 6 for 7 o'clock in the evening, 60 lots of exceedingly valuable FREEHOLD BUILDING LAND, having good depths and important frontages to the main road from London to Epsom, and within three minutes' walk of the Tooting Junction, from whence there are frequent trains to London Bridge and Victoria. The estate is well drained, and overlooks first class property.—Plans and particulars may be had on application to Messrs. Learoyd and Co., Albion Chambers, 24, Finsbury-pavement, E.C., and to the Auctioneer, Mr. RICHARD J. COLLIER, Milner's-buildings, 28, Finsbury-pavement, London, E.C.

In the High Court of Justice, Chancery Division.—Kynaston's Settled Estates.—To be Sold, Pursuant to an Order in the above matter, with the approbation of the Vice-Chancellor, Sir Charles Hall, by

MESSRS. ELGOOD, at the Auction Mart, Tokenhouse-yard, in the City of London, on MONDAY, the 11th day of July, 1881, at two o'clock in the afternoon precisely, in one or more lots, the FREEHOLD RESIDENTIAL and BUILDING ESTATE of nineteen acres, comprising a capital Residence, known as Kynaston Court, and meadow land, situate at Harrow Weald, in the County of Middlesex.—The property may be viewed, and particulars, with conditions of sale and plans, obtained at the Auction Mart; of Messrs. Gasquet and Metcalfe, 9, Idol-lane, Great Tower-street, in the City of London, Solicitors; of the Auctioneers, Messrs. ELGOOD, 4, Vere-street, Cavendish-square, in the County of Middlesex; and Messrs. Winkley and Co., Estate Agents, Harrow.

Dated this 20th day of May, 1881.

H. A. CHURCH, Chief Clerk.

Gasquet and Metcalfe, 9, Idol-lane, Great Tower-street, E.C., Solicitors for the Petitioners.

At very low upset prices.—Thornton Heath.—To small Capitalists, Speculative Builders, and others.—Fifty-three plots Freehold Building Land in the Quadrant and Elliott-roads, close to the Thornton Heath Station, and within easy reach of the tramway, which runs to Croydon. The land is divided into plots of 40ft. and 50ft. frontage each, and averaging about 100ft. in depth, suitable for detached and semi-detached residences. Roads and sewers constructed.

MESSRS. FAREBROTHER, ELLIS, CLARKE and CO., will offer for SALE by AUCTION, on the premises, close to the Thornton Heath Station, on Thursday, 30th June, at 2 o'clock precisely, 53 PLOTS of FREEHOLD BUILDING LAND in Lots. May be viewed. Particulars may be had at The Greyhound, Croydon; of W. H. Rowland, Esq., solicitor, Croydon; of Messrs. Perry and Reed, 9, John-street, Adelphi; at the office on the estate; or of the Auctioneers, 5 and 6, Lancaster-place, Strand, and 18, Old Broad-street, E.C.

Rotherhithe.—St. Helena-gardens.—Valuable Freehold Building Estate, in the vicinity of Southwark-park and the Commercial Docks.

GLASIER and SONS will SELL by AUCTION, at the Mart, on THURSDAY, July 7th, 1881, under an order of the High Court of Justice, Chancery Division, made in the cause of Watts v. Leathes, and with the approbation of the Right Honourable the Master of the Rolls, a highly important FREEHOLD PROPERTY, comprising nearly four acres of valuable building land, in the immediate neighbourhood of Deptford Lower road, Rotherhithe New-road, and the South Bermondsey Station on the London and Brighton Railway, known as the St. Helena-gardens, together with the St. Helena Tavern and Music Hall, eight cottages known as Lemon-valley, six other cottages, and other buildings. The property possesses an extensive frontage to Corbett-lane, and offers a suitable site for the erection of manufacturing premises or small residential property. Let to Mr. Preece until Midsummer, 1886, at a rent of £30 a-year. Particulars are preparing, and, when ready, may be obtained of Messrs. Smith, Stenning, and Croft, Solicitors, 70a, Aldermanbury, E.C.; Messrs. Leathes and Maynard, Solicitors, 3, Langham-place, W.; at the Auction Mart; at the St. Helena Tavern, Rotherhithe; and at the offices of the Auctioneers, 41, Charing Cross.

Littlehampton.—To Builders and Contractors.—Robey's Patent 12 Horse-Power combined semi-fixed Steam-Engine and Boiler, with double cylinders. Worssam's patent General Joiner with circular saws, and tools; Worssam's improved saw sharpening machine, circular saw bench (by Charles Powis and Co.), machine implements. Powerful cart-horses, harness, builders' carts, strong spring vans, horse and hand steam trucks. Builders' stock, plant and implements, seasoned materials in mahogany, oak, pitch pine, and elm plank and boards, oak logs, and manufactured doors and sashes. Stonemasons' stock and implements, plumbers' and painters' stock and materials. Lead, glass, oil cisterns, and fittings. Blacksmiths' stock, forges, bellows, tools, and effects. Builders' ironmongery and brass-work.

MR. JABEZ STREETER has been favoured with instructions from Mr. Robert Bushby, who is retiring from business, to SELL by AUCTION, upon the premises, on TUESDAY, the 14th June, 1881, and FOLLOWING DAYS, commencing each day at one o'clock, the above extensive MACHINERY and STOCK. Further particulars and catalogues, seven days prior to the sale, may be obtained at the Offices of Mr. JABEZ STREETER, Auctioneer and Appraiser, Littlehampton. Established 34 years.

Important Sale of First-class Brass Gas fittings, Gaseliers, and General Brass-work, China and Porcelain Door Furniture, Register Stoves, Fenders, Patent Mortise Locks, Ironmongery.

MR. SCAMELL will SELL by AUCTION, at No. 21, Old Bond-street, on TUESDAY, the 14th June, and two following days, commencing at 1 precisely, an extensive assortment of BRASS GAS-FITTINGS, Gaseliers, Brackets, in modern and artistic designs, first-class General Brass Work. Brass Cocks, &c.; a large variety of China and Porcelain Door Furniture and Finger Plates—Plain, Cream, and elegantly-coloured; Register Stoves; Fenders in Berlin Black, Bronzed, Ormolu, and Nickel-plated; patent Mortise and other Locks, and a variety of useful items suitable for the Building Trade.—May be viewed on Monday, the 13th June, and Catalogues had at No. 21, Old Bond-street, and of Mr. SCAMELL, 40 and 41, Upper Thames-street, London.

FIRE at G. MITCHELL'S MARBLE GALLERIES, 166, Brompton-road, London, S.W.—In consequence of the late destructive fire, Mr. MITCHELL has a large SALVAGE STOCK thrown upon his hands, consisting of Marble, Stone, and Alabaster Chimneypieces, Stoves, Fenders, Kitchen Ranges, Tombs, Crosses, Tablets, &c., which he is prepared to DISPOSE OF by PRIVATE CONTRACT immediately, at very low prices. The Royal Arms in stone, large size, slightly damaged. Also a number of Scagliola Columns, &c. Offers for any part or this late valuable Stock are respectfully solicited. Approved bills taken.—G. MITCHELL, 166, Brompton-road, London, S.W. Business carried on as usual at 148, Upper Thames-street; also at Chelsea Works.

PURE WATER. — All the Messrs. LIPSCOMBE'S FILTERS are now made with their New Preparation of Charcoal, wonderfully effective, far surpassing every other. Old Filters of every kind reconstructed.—Temple Bar; 44, Queen Victoria-street; 100, Westbourne Grove; 69, Oxford-street.

THE BUILDING NEWS.

LONDON, FRIDAY, JUNE 17, 1881.

COMPETITIONS WITHOUT PERSPECTIVES.

THERE are two classes of architects who have every reason for trying to exclude perspective views from competitions: those who cannot make a tolerable perspective view, and those whose designs will not bear putting into perspective. Of course, a design that will not bear putting into perspective, is a design that will not bear being built—a something that is plausible on paper, but which is an unmistakable failure when set up in bricks and mortar; for a perspective view shows the work as it will really appear, while the plans and elevations show it as it never can by any possibility appear. This is just what many competition committees do not understand. They think a front elevation is a correct front view of a building, that a side elevation is a correct side view, and so on; whereas an elevation, of whatever sort, shows the building in a way in which no one, by any conceivable device, will ever be able to see it. An elevation, in fact, is a view of a building from an infinite distance, enlarged so as to look as big as the building would look at the distance, say, of a few dozen or a few hundred yards. The nearest approach which can really be made to seeing a building in elevation, is to take up a point opposite one one of its sides, and on a level neither above nor below it, some ten or twenty miles off, and then look at it through a first-rate telescope. It is obvious enough that there are not many buildings in England which it is physically possible to look at in this way, and not many days in the year, or many hours in the most favourable day, when their architectural design would be at all distinguishable. Yet it is only in some such way as this that buildings can be seen in elevation, or anything approaching to elevation.

No doubt there is a certain class of designs in which the elevation of the front and a near view of the front look very much alike; it is the class in which the front is only a flat piece of scenery, meant to hide the actual building from view. A near view of a flat wall, with no features behind it, and no projections, except very trifling ones, in front of it, is very much like an elevation of the same wall. But a wall is not a building: and as soon as any parts of the building, whether roofs, chimneys or other walls, are allowed to appear behind the front wall, the elevation and the actual view at once become widely different. The architect who treats his building as a whole stands little chance in a competition from which perspectives are excluded. Everything is in favour of the sham-front-monger, the person who, instead of making his building artistic, leaves it just as chance directs, and hides each visible side of it behind a sort of drop-scene, perfectly unconnected with the realities it conceals. If there is a chance for anyone else, it is for the architect who sticks to the trite, the hackneyed, and the commonplace. What people have seen over and over again, they can to some extent judge of, even under the impossible aspect in which geometrical elevations show it. They remember how it looks elsewhere; and in a competition they very often select it, because, of all the designs submitted, it is the only one which, in the absence of perspectives, they can fairly picture to themselves. Thus the prohibition of perspective views plays into the hands of two classes: the class which deals in screen-fronts, and the class which deals in stock-patterns. It gives a premium to shams, and an honourable mention to mediocrity, but a heavy blow and great discouragement to all that is original, genuine and artistic. It is hard enough to get good work accepted when people have it intelligibly set before them: it is too bad to smother it in a yet earlier stage, and prevent it even from being intelligibly presented.

To see how this exclusion of perspectives really operates, take, for example, a few types of church arrangement, and imagine them set before a competition committee. We are taking it for granted throughout that no really competent architect is called in to make a selection; for if such an architect is called in, and if (which is assuming a good deal) the committee may be relied on to adopt his selection, the whole aspect of the case is changed. Suppose, however, that there is no professional judge, and suppose that perspectives are entirely excluded. The first design, perhaps, shows a central tower. The committee look at the west elevation, and the tower appears to rise from the top of the west gable. Some few wiser than the rest point out to their fellow-members that it does not really stand there, but is set back by the whole length of the nave. There is a difficulty in getting even this clearly realised, for the forms which are familiar enough to every architectural student are not easily imaginable by people who have never studied architecture at all. By degrees, however, the thing is explained; and some more or less vague, hazy, and distorted notion of the whereabouts of the central tower is present to everybody. But this does not prevent the elevation of the tower from spoiling the elevation of the west front, nor the west front from spoiling the elevation of the tower. The drawing shows them together in a way in which they will never be seen together, and however admirably each may be fitted for its real position, they are mutually ruinous when shown on that impossible view called a "front elevation." The transepts again stick out in a way which makes the elevation look like a jumble of disconnected parts, and the committee's imagination is again called upon to realise that these same transepts are 80ft. or 100ft. back from the west front, of which they seem to form a part. Naturally enough, their imagination cannot realise all this. Some perhaps entirely doubt it, and having heard that an elevation shows a building as it really is, there is no convincing them that the place if built will look like anything but that which the drawings represent. What with the doubts of some members, and the imperfect apprehension of others, this design is soon cast aside as impracticable. The next one, it may be, shows a western tower, forming the termination of the nave. Everyone now can understand where the tower is; but the difficulty is to make them understand where the church is. Half the committee get the idea that the church will be hidden entirely, once and for ever, and that nothing but the tower and side aisles can possibly be seen. Then the tower looks so tall and narrow; of course it does, when the elevation cannot show the nave roof abutting against it, and cannot explain how much wider the tower will look when two of its sides are seen together, as they generally will be. If the architect has so proportioned his tower that it will look right when built, it is pretty sure to be blamed by amateurs who only see the geometrical elevations of it; and he may take it for granted that his labour will be thrown away. So, on one ground or another, a multitude of the designs are disposed of: their virtues are mistaken for faults, and the very points which would have been most admirable in reality are, oftener than not, the reasons for their condemnation. By and bye, however, comes up a set of drawings "made to sell." They are based on the tritest of all trite ideas, used up a thousand times in the "regulation Gothic chapel" of Nonconformists, as well as in the very poorest examples of Anglican church building: the idea of a thin tower and spire on one side of the front gable, and an aisle or a porch on the other side of it.

This, at any rate, is intelligible in elevation. All the committee know exactly where the tower will be, and where the church will be, for both are in one flat façade, and side by side. There is no doubt, no vagueness, no uncertainty, in their minds now; they have seen the same thing scores of times before, and know what they shall be doing if they adopt it. The only question that remains is as to the detail. If there is a pretty spire and a pretty front, some pretty tracery and a few pretty pinnacles, they think it will do, and the competition ends like many others—by its promoters finding themselves in a pretty mess. In prohibiting views, they, of course, restricted competitors to elevations of the outside, and to sections of the inside, and if elevations are misleading, sections to the great majority of amateurs are simply bewildering. Hence the committee that shuts out views really knows nothing, or next to nothing, of the internal effect of the design it selects.

Architects are often blamed by the public for giving no thought to the insides of their buildings. We might retort, that the man who does not give the first thought to the insides of his buildings is not an architect at all, and that the public have only themselves to blame if they patronise him. But this delusive system of judging by elevations, plans, and sections only, offers all its rewards to men who care nothing for the insides of their buildings, and holds out every inducement to better men to care nothing for them either. In every design worth calling such, the interior is the reason and motive for the exterior; and on the view-excluding system the interior is the one part which the committee know nothing about. They know, indeed, the arrangement of doors and windows, of rooms and pasaages; but what sort of place the interior will be for light, for air, for acoustics, for artistic effect, they hardly know at all. To take the case of a church again; they know very well, from the ground-plan, how the seats are placed, where the passages between them are, and a lot of details of the like second-rate importance, but as to what the inside, as a whole, will be like and look like, they have scarcely the faintest notion. Those of them who have a little knowledge of building, may explain that certain black marks on the sections mean walls, and certain brown dots show where joists and rafters are cut across; but in a vast number of cases, not even a practised artist would pronounce with certainty on the merits of an interior till he had sketched it in perspective for his own instruction. When each member of a building committee is able to do this, and do it with accuracy, it will be reasonable and wise to exclude perspective views. Till then, it is about as promising to try to decide without them, as to try to decide by written descriptions, without drawings at all. Elevations and sections do not show a building as it will appear, any more than descriptions show it so: and it may be seriously doubted whether, of the two, the elevations and sections are not the more deceptive and dangerous. No doubt perspectives have been misused at times, but the difference between them and geometrical drawings is this: Perspectives of a building *may* be made deceptive; elevations and sections, except to thoroughly practised eyes, *must* be deceptive, and grossly so. Perspectives, if truthful, do really show buildings as they will appear;

elevations and sections, if truthful, show them as they never can by any possibility appear. The best way to prevent untruthful perspectives from being submitted, is to call in a really competent architect as referee, who can easily detect them. Even his appointment will hardly, as might be thought, make perspectives needless, because his advice, without views to give a visible support to it, might fail to get the best design selected. Lastly, perspective views no doubt take time and money to prepare, but their expense might be reduced by reducing their size. Instead of excluding perspective views altogether, committees would be incomparably wiser if they excluded all that measured, say, more than a foot in their longest dimension.

THE BLACK AND WHITE EXHIBITION.

FOR variety of subjects the present exhibition of works in black and white now open at the Dudley Gallery, Egyptian Hall, surpasses the last year's display; it would not indeed be too much to say the exhibition is rather above the average of those of recent years. Many artists of repute are contributors, and there are a few important works on the walls. As on former occasions, engravers and designing artists who contribute to popular illustrated periodical literature, muster pretty strongly, and the original drawings for Cassell's *Magazine of Art*, "Our Own Country," and "Illustrated British Ballads," take up a large area at the end of gallery. Messrs. Cassell, Petter and Galpin, in fact, contribute over 100 sketches. The work of this year appears to include almost every kind of monochrome drawing, sepia and Indian ink, charcoal, pen and ink, etching, crayon, &c. Taking the order of hanging, we may devote the following remarks to a brief notice of a few of those drawings which claim consideration either for their truthful, graphic execution, or their skilful conception or handling. A very powerful etching by Henry Guérard, "Le Chat Noir," is remarkable for the depth of tone and luminous eyes of the black cat; the latter are wonderfully real in their brilliance and piercingness. Close to this, F. A. Hopkins shows a rather decoratively-treated subject, "Grandchildren of the Period," an outline sketch of a few naked, chubby children following one another, the leader carrying a large sunflower, and the rear brought up by another dragging a flower on wheels. "La Contemplativa," a red-crayon study, by Alice M. Chambers, is a reclining female figure, drawn in a decorative vein, and illustrating a canto in Dante's "Purgatory." No. 21, by H. G. Branling, "View of the Schöne Brunnen, Nuremberg," is interesting. The picture shows an elaborate fountain; it is drawn in pen-and-ink. The detail is well put in, but the drawing wants expression, shadow, and force. Stephen Parrish's "A Bit of Marble-head" is clever; and W. Niven's charming little etching of the "Three Nun Court, City," showing tower of St. Michael's Bassishaw, will be looked at with interest. The first-named artist's view of "Portsmouth Harbour" is a vigorous etching, full of light and shade (31); and we must also glance at C. P. Slocombe's clever group of pines entitled "A Fine Day on the Surrey Hills," an etching worthy of the artist's skill, and A. Davis Cooper's amusing incident "In Possession" (37), in which a blackbeetle on a doorstep keeps a little dog at bay, and fills him with undisguised alarm and surprise. We can hardly say Walter Crane's large cartoon for decoration, in low relief in sepia and white, "The Lion in Love" (40), is either good as a composition or a drawing. The female figure and the lion sitting at her feet do not very happily fill in the semicircular form of the panel; there is also a feebleness in the design and accessory ornament. A very forcibly-executed lithograph "L'Enfance du Christ," by H. Fantin shows how well this mode of delineation may be made to lend itself to figure compositions. G. Du Maurier shows (41) a clever drawing for *Punch*; and C. O. Murray, an etching after Alma Tadema, R.A., of that painter's "Sappho." Frank Murray exhibits one of his vigorous sketches "On the Ramparts, Tower of London" (56); and the same artist's original drawings of architectural subjects for the *Magazine of Art* such as the "Morning-Room, Ford Castle" (182), and Indian-ink sketch of an Elizabethan interior; "The Norman Gateway, Alnwick" (186), and the "Percy Bedstead," in the same castle, are evidence of much pictorial power in the delineation of this class of objects. The "Old Clock Tower, St. Alban's" (224), and the boudoir and secret stairs of Ford Castle, the "Barbican," and the "Pottergate, Alnwick," are other clever Indian-ink sketches by the same artist. Few of the chalk studies of heads equal Maude Berry's No. 60, a picturesquely-drawn face with the mob-cap. The most masterly studies in black and white are contributed by Léon Lhermitte, whose works have for years added to the reputation of this exhibition. No artist in charcoal can surpass this gentleman in the pictorial portrayal of common incident, and his chiaroscuro is always powerful and characteristic. The carpenter at work at his bench in "Le Menuisier" (61), is a remarkable example of these qualities; the light and shade is skilfully managed, and the drawing bold and truthful. "L'Imprimeur" is equally telling as a drawing of a printer at work, broad in handling, and the artist has cleverly conveyed the effect of top-light through a skylight. The grouping and drawing of heads in "Cour de la Philosophie à la Sorbonne" (123) is, indeed, one of the best studies of this artist. "The Interior of the Church of St. Severin" (138), the "Marchandes des Rues à Paris" (294), and "Marche aux Fleurs de St. Sulpice," are also powerful French studies, full of bold sunlight effects, broad masses of shadow, and poetic effect. The figures are drawn with animation, and the groups are well modelled, and there is an absence of that lininess and finical touch so common among artists of the English school. Lamp-black is a favourite means of working up subjects for illustrations, and some very excellent specimens of lamp-black or neutral tint sketches, the lights being put in with Chinese white, are to be seen. O. Rickatson (63) has a very photo-like study of cottage and trees; and Samuel Read exhibits (71) "Woodleigh Grange," the original drawing of a subject which appeared in the Christmas number of the *Illustrated London News*, executed in India ink. G. L. Seymour, well known as one of our best designers and etchers, sends a clever study in "The Towing Path," the engraving for which appeared in *Little Folks*, and near it the late Mr. Burges, A.R.A., is remembered by his characteristic pen-and-ink drawing of "St. Simeon Stylites" (79), a reproduction of which appeared in the BUILDING NEWS some years since. S. T. Dadd contributes three studies in a frame, exceedingly clever in drawing, and pointing a moral, entitled "A Bone of Contention," in which a dog and a bird are the principal actors. Neutral tint relieved with opaque white is employed. J. Mac Whirter, A.R.A., sends an etching of a "Fisherman's Haven" (83); F. Chiffart, a clever eau-forte; and S. Stevenson's etching and dry-point of the "Lonely Pool," and "The Close of Day" (10), in brown, are feeling in their effective execution and colour.

Two etchings, "Lowering Sail" (100) and "The Gareloch" (107), are to be noted for their strong sunlight on the waves in one piece, and the reflection of light on the still lake in the other; both equal to their artist's skill as a marine painter. W. B. Fortescue has produced a very pleasing crayon study of a gleaner (136). The stooping girl is drawn in a soft, tint-like manner; and near this, J. C. Dollman sends one of his amusing sketches of animal life, "A Common Group," showing a donkey set upon by a number of geese in an open common. There is much quiet humour in this sketch, which is done in oils. No. 143, "Greenwich," is a charcoal sketch of the river and hospital, exhibiting a pleasant pictorial treatment of light and shade. A French artist of promise, Achille Dieu, contributes a few admirable landscapes. Nos. 152 154 are good specimens of broad-shaded masses, executed in chalk, in a manner which indicates a thorough feeling for landscape effect. The visitor will be pleased with R. W. Maddox's "Dora" (158), a study of a head in chalk, and a French work by Bracquemond, an eau-forte (166), representing the "Séance de la Convention du 20 Mai, 1795," a tumultuous scene, worked out with much dramatic power. "Old York Gate, Adelphi," by John O'Connor, is a large and effective drawing of this interesting but disused relic. We might criticise the drawing in the proportions of entablature and capitals of columns.

A very overpowering cartoon in oil, measuring 16ft. by 12ft., occupies the top part of the upper end of gallery. Adolph Pichler, the artist, depicts the "Death of Jacob," as described in the 49th chapter of the Book of Genesis. Jacob lies on his death-bed, surrounded by his sons, representing the 12 tribes of Israel. The cartoon is on canvas, and the composition and grouping are effective and bold. The figures are rather over life-size, and are painted in brown. Reuben, Jacob's first-born, is seen in the background with a cast-down expression; the heads of Simeon and Levi are expressive of their cruelty and anger, and the grouping of Joseph and his two sons, and others, close to the bedside, is painted with more power than grace. The price of the picture is £2,000. We have already referred to Messrs. Cassell's collection of original drawings for their publications. These occupy a large part of the wall at the end of room, and are very instructive as examples of black and white effects. Besides those by F. Murray, many are drawings by G. G. Kilburne, Percy Macquoid, G. L. Seymour, A. C. Gow, A.R.A., C. Gregory, F. Dicksee, A.R.A., A. Barraud, J. C. Dollman, Ernest Crofts, A.R.A., R. W. Macbeth, W. H. Overend, &c. The "Open-air Pulpit, Oxford" (231), "Fountains Abbey" (232), and G. L. Seymour's "St. Mary's, Oxford" (242), are excellent specimens of India-ink and neutral-tint drawings to a small scale. The latter is a very pictorial sketch of the spire, and the light and shade and atmosphere are rendered with as much care as the drawing. F. Dicksee's "Romeo and the Apothecary," W. Small's "Eugene Aram," and Nos. 255, 249, 279, are also very effective, Henrietta R. Rae's "Still Waters," in charcoal (301), the pen-and-ink view of "Warwick Castle," by E. W. Waite (303), and the remarkably able composition, in India ink, entitled "La Vision de Fray, Martin" poema de D. G. Nuner, de Avec, Canto II., of which there are three, 313, 377, 379, by José J. Aranda, will well repay study.

Among the chief architectural drawings we may mention two pen-and-ink designs, showing some good figure arrangements by Isaac A. Gibbs, Nos. 316 and 315. The latter, for decoration of a chancel, is rather crowded, and we like the spaces over the window best. A. H. Haig sends a well-toned etching of the "Aisles of Chartres" (389); E. W. Waite, "Magdalen College," in pen and ink. R. Phené Spiers's bright

sepia sketch of the "House of Jacques Cœur, Bourgos," showing interior of courtyard, with its piquant octagon turret, is perhaps more attractive to the architect than many of the etchings, and is a good example of working in sepia. The work of H. W. Brewer (428), in chalk, shows a remarkable porch or doorway to St. Martin's Church, Landshut, Bavaria, the main feature of interest being that the two outer arches form projecting canopies, the salient angles of which are the apices of the arches and the central re-entering angle the springing of the two inner arcs which form a pendant. The other pen-and-ink composition of the "Water Gate" (570) is hardly up to the former work of a similar description, exhibited in this gallery by Mr. Brewer. A cathedral in Late French Gothic stands upon an eminence surrounded by the fortified walls and gate.

A. Bertrand is a consummate master of the brush in figure grouping. The animated group of figures in "Les Halles Centrales: le Matin" (353), and in No. 404, another view on the Seine, are most skilfully manipulated in a sort of sepia worked with a dry brush; the lights seem to be taken out, and a very soft aërial atmosphere, with the most delicate finish, is obtained. "A Hundred Years Ago" (361), by Stanley Berkly, No. 366; the grand sea-scape by F. Powell (380) vigorously drawn in charcoal with soft clouds; the fine expressive countenance in A. Wassie's "In the World and Not of it," in chalk and charcoal, a powerful work; T. Graham's "Patience" (429), a free sketch in chalk; L. Sambourne's clever illustrations for *Punch's Almanack* (450); A. Glendenning, "Old House," in lamp-black (463); W. F. Stock's finished sepia sketch, "In Time of Harvest" (469); No. 511, a charcoal study of figures; No. 518, "A Venetian Piazza"; No. 519, "Haddon Hall," 524; "Greyfriars" (528), are other drawings of note on the walls. On the door-screen, the illustrations to D. G. Rossetti's "Blessed Damosel," by H. Holiday in pencil; and some sketches in sepia, by J. Hayllar, are among the best drawings, and the general visitor will find interest in the Princess of Wales's large sketches, in neutral, of mountain scenery.

THE FRENCH INTERNATIONAL CONGRESS OF ARCHITECTS AT PARIS, 1878.

(*Continued from p.* 684.)

SECOND SECTION.—PROFESSIONAL CHARGES.

THE discussion on this subject lasted longer than any of the others, four meetings being devoted to it. In addition to the resolutions passed by the Council of Public Buildings, the 13th February, 1807 (12 Pluviose An VIII.), and confirmed on the 6th July, 1846; communications from various provincial societies, and the scale of charges adopted in Germany, England, and Sweden were deposited, and now form part of the report. The "Avis du Conseil des Bâtiments Civils" states "that considering there exists no positive law on the subject of professional charges of architects, there is at least a custom which may regulate the decision of the Courts. The following may be taken as the rule:—

1. Plans and designs, 1½ per cent.
2. Superintendence of work, 1½ per cent.
3. Specifications, quantities, and settlements of accounts, 2 per cent.
4. Together, 5 per cent. on the total cost.
5. For designs made and not carried out, 1 per cent.
6. In addition to the above, for work carried out at a distance by the architects of Paris, Lyons, Bordeaux, Nantes, Rouen, and Lille, there is due 6 francs per myriameter (about 7½ miles), and 4·50 for architects of other towns.

Charges for work executed under £200 (5,000 francs), 7 per cent."

On this basis Monsieur Meurillon, of Lille, presented a communication from the architects of the Northern Society of France, drawing attention to the inadequacy of the payment in certain cases, and the need of further legislation, more especially with reference to arbitrations.

This communication pointed out that whatever might be the merit or the position of the artist who conceived the design, whatever the nature of the work, whatever the amount of time or display of skill or knowledge, the remuneration was always the same. So that the conscientious or talented artist is not better paid than the merest beginner. The painter and sculptor sell their works for their value; the doctor and solicitor charge fees according to their knowledge and position; the architect only is tied down by custom to fees which, in many cases, are not remunerative. The resolution or decree takes no note of the extra labour required in works of restoration, maintenance, or decoration—in all of which cases an increased scale of charges might be demanded on account of the extra time, care, and trouble which such works require.

In Government work, M. Meurillon pointed out, copies of all the drawings, specification, and quantities have to be deposited with the Administration, for which no extra payment was allowed by the decree, though it was true that in some provinces of France payment for these was allowed to be made by the contractor—a practice, he stated, not to be recommended. In the place of the 7 per cent. for works under the value of £200, M. Meurillon proposed a sliding scale, varying from 5½ per cent. up to 10 per cent. For the expenses of the expert's arbitration, he suggested a provision of money should be made in each contract.

The German scale of charges (agreed upon in a congress held at Hamburg in September, 1868, when about 800 architects were present), follows Mr. Spiers' description of the English scale. The German system is very complicated, and if carried out strictly, would seem to cause endless disputes. There are five classes of building, and no less than nine times five—45—different percentages, according to the cost of the executed work and its class. Briefly, the five classes are:—

1. Sheds, magazines, markets, exhibition galleries (temporary structures), workshops, manufactories, and houses for the working classes.
2. Stables, greenhouses, dwelling-houses, villas, schools, simple churches, hospitals, barracks, prisons, and other Government buildings.
3. Town and country houses of importance, country mansions, churches, chapels, libraries, museums, theatres, exchanges, town-halls, law-courts, and Parliament buildings.
4. The same as the 3rd class, but of greater magnificence: Palaces and triumphal arches.
5. Interior and exterior decorations: Altars, pulpits, organs, monumental fountains, &c.

For the percentages there are nine divisions according to the cost of executed works; between the respective values of £120, £300, £600, £1,200, £2,400, £3,600, £6,000, £15,000, £30,000, and above £30,000. For buildings under Class I. the percentages vary from 2 per cent. to 5 per cent.; under Class II., from 3 per cent. to 6½ per cent.; Class III., 4 per cent. to 8 per cent.; Class IV., 5 per cent. to 9½ per cent.; and under Class V., 6 per cent. to 11 per cent.

The following is the work included in the percentage scale:—

a. Sketch design (plans and elevations to ⅛th scale), with sketch specification.
b. Contract drawings (plans, elevations, and sections to ¼ scale), and specification.
c. Working drawings and details, decorative and constructive.
d. Quantities. (These are probably not so much in detail as the English sets.)
e. Superintendence of work (exclusive of clerk of works.)
f. Settlement of accounts (measurement of extras and omissions being at the cost of client).

No proportionate subdivision of the relative values of these is given.

The salary of clerk of works and his office on the works is at the cost of the client, and if none be employed, there is an extra charge due to the architect.

In cases of arbitration, taxing of costs, and other extra work, the architect must be paid at the following rate:—For a half-day of four hours, 12s. the least charge. For a whole day of seven hours, 18s. the least charge. For loss of time spent in travelling, half the above amounts. Expenses of board and lodging when travelling (10s. per diem) and travelling expenses in addition.

Payment on account in proportion to the progress of the work. The percentage due to the architect is on the amount of the contract sum only, unless he can prove that the extras were incurred for extra works or alterations ordered by the client.

All drawings are the property of the architect; the client may demand copies, but he can only use them for the work in question.

The English scale of charges and condition of contract follow next in the report: these are too well known to our readers to require comment on them here.

The Swedish scale of charges comes after: nothing is said as to the date of their publication, but they are evidently based on the German scale, and appear to have followed strictly their classification. They vary from 1 per cent. for works of class I. above £28,000 in value, to 10 per cent. for the works of class V. between £280 and £560. The works are thus detailed:—

a. Sketch plans to scale (not mentioned), with approximate description if required.
b. Working drawings, with general description of materials, if not already given.
c. Quantities and detail specification.
d. Working drawings and details.
e. Arrangement of contract and superintendence of work.

The relative cost in decimals when 5 per cent. happens to be the total is *a*, ·50 per cent.; *b*, 1·00 per cent.; *c*, ·25; *d*, ·75; *e*, 2·50.

When 6·80 per cent. (for the sake of comparison with our scale, and on the assumption that 1·80 per cent. is the value for bills of quantities), *a* is ·70 per cent.; *b*, 1·40; *c*, ·30; *d*, 1·00; and *e*, 3·40.

It is evident, therefore, that their notion of quantities must be very different from ours, and yet it is specially described as *calculation of cost with indications of quantities and price, as also description of materials and labour.*

Then follows a series of notes, the first stating that if sketches only are required, the scale of charges under this head must be increased by one half, in the third note the architect can only claim payment on contract sum; the fourth provides for his extra payment if it is due to changes or additions (presumably by client's instructions), and the seventh defines payment on account according to the progress of the works.

Beyond these charges are others:

a. For the measuring and preparation of drawings of ancient or existing work (to be agreed upon).
b. For surveying and valuation of buildings, the architect is paid according to time spent in.—For surveying without report, 17s. to 45s.; for surveying with report, 28s. to 112s.
c. For surveys carried out at a distance, loss of time, 17s. per diem. If not followed by order to execute works, 28s. per diem. In both cases the architect may charge travelling expenses—1st class on steamboats, 2nd class on the railway, and two horses to his carriage if across country.

In the subsequent communications made by some of the provincial societies, questions of detail were entered into which would only be applicable to provincial architects' practice in France. Monsieur Ravon, architect, of Paris, read a carefully prepared essay, in which he complained that French architects were not remunerated so well as those of other nations. The old scale of charges was made at a time when economy of construction was not so much thought of, and before building construction had become a science. The introduction of iron as a building material, and the careful calculations required for its economic use; and the numberless inventions of every kind required much more serious study and attention on the part of architects. M. Ravon

deprecated, however, the introduction of sliding scales and division of classes of buildings, which would only lead to endless complications; he considered there could only be two classes of work: 1st, new work; and 2nd, alterations or additions to existing buildings, or their restoration; for the former work he would fix 6 per cent., for the latter 8 per cent. He considered it impossible to fix any sliding-scale for works which required special talent or art knowledge.

Further, he considered that the architect ought to be paid according to the value of the work done *under the official tariff of prices*, and *not the diminished amount* for which the contractor in competition offered to execute it.

The general feeling of the members of the section seemed to be, however, in favour of classification of buildings and a sliding-scale, when M. Davioud, the architect of the Trocadéro, came down at the last meeting, proposed and carried, though not by a large majority, the following resolutions, which were subsequently adopted by the general body:—

1. This Congress, recognising the principle of the liberty of artistic work, and its free remuneration, of which the foundation should be based on the economical principle of supply and demand, considers that every architect has the right to adjust the value of his services according to his own estimate of what would be a just recompense for his talent, taking into account the special difficulties which may arise in each case.
2. Nevertheless, in the absence of any other arrangement, the scale of charges fixed by the Council of Public Buildings, the 13th February, 1807 (old style), might be taken as a minimum until a more favourable scale be obtained.
3. The Congress considers that the scale of charges then settled is no longer in accord with the altered value of money, and requires an augmentation to be uniformly adopted for all France.
4. The Congress to nominate a committee to study the communications made, and report upon a revised scale, such report to be made at the Congress of 1879.*

We have not been able to ascertain whether any further action was taken. From the fact, however, that the report with its communications has only just been published, we may assume that the work of the committee has been delayed in consequence.

THIRD SECTION.—PUBLIC COMPETITIONS.

M. Davioud, who started the discussion on this subject, dwelt on the numerous complaints which were made generally on the management of competitions, and suggested that whatever resolutions the Congress should arrive at, they should be sent to the Minister of Public Works with the request that rules should be laid down for the conduct of public competitions. The Minister would probably be able to obtain a decree from the President of the Republic by which such competitions would be regularised and made uniform throughout France. All competitions to be put under the authority of the Minister, who would stop any who did not comply with the desired conditions. All this sounds very delightful, and a great deal of trouble might be saved if we here in England could arrive at a similar result.

M. Davioud observed that there were two objects the promoters of a competition had in view. First, to obtain ideas respecting a building about which (before the competition) they knew very little; and second, to find an architect who would carry out their own ideas. If, in the first instance, the promoters understood their subject well, and drew up a well-defined programme, the designs sent in would probably meet their views. Such is, however, rarely the case: the promoters generally scarcely know their own minds, and therefore M. Davioud proposed competitions of two degrees: the first one to consist of sketch designs only, from whom four or five would be selected to go in for a second competition. All these four or five would receive a sum of money sufficient to remunerate them for their expenses; but they should not be obliged to compete again. This seems a singular idea; it is equivalent to giving four or five prizes of equal value, and restricting the further competition to those selected for the prizes. (A somewhat similar course was adopted in 1861 with the competition for the Grande Opera, except that the prizes were 3,000fr., 2,000fr., and three of 1,500fr. M. Garnier, who obtained the last, therefore knew that he must prepare a much better plan or he would have no chance. The architect placed first thought he could not do better than stick to his. All the designs were publicly exhibited, and M. Garnier to a certain extent probably profited by the fact that he was placed last of the five selected in the first competition). M. Davioud further proposed that the jury should be a small one (three or five, according to the importance of the competition), and that they should give a reason for their decision. In the first competition the jury would be appointed by the Government from a list drawn up by the immediate promoters. The jury would be doubled in the second competition, an equal number of names being added by the competitors. Some discussion followed as to the desirability of having a public exhibition of the first series of designs, because it would enable the chosen candidates for the second series to profit by the ideas of others. In the end, however, it was thought that the public would gain by it. M. Strohm, the delegate from St. Petersburg, contended that the authors of the designs ought to be allowed to appear before the judges *to explain their own designs* and to *criticise the designs of the others*; this he thought would necessitate each competitor being the author of his own design, or he would not be able to explain it. Eventually the propositions put forth by M. Davioud were accepted, and placed in the hands of the Société Centrale to carry out; but we are not aware that any further action has been taken on it.

* At the Congress of 1879 the subject was deferred till after the publication of report.

ARCHITECTURAL ASSOCIATION.

THE closing meeting of the association was held on Friday evening, and was largely attended. The retiring President, Mr. Ernest C. Lee, F.R.I.B.A., occupied the chair, and mentioned that Mr. Ewan Christian had offered to conduct the members over a house he was building for himself at Hampstead; unfortunately, the Saturday afternoons had all been allotted, but the committee would endeavour to arrange for a visit.

THE COMPULSORY R.I.B.A. EXAMINATION.

Mr. R. C. PAGE, hon. sec., read a report prepared by a committee, of whom Mr. Douglass Mathews was chairman, upon the means which can be adopted to bear on the studies of the members with reference to the Institute examinations. They recommended that courses of lectures be delivered on the following subjects:—(*a*) "History of Architecture"; (*b*). "Nature and Property of Building Materials, and their Adaptation to Building Construction"; and (*c*) "Professional Practice." The committee believed that well-known members of the profession would be willing to undertake a course of twelve lectures, or two courses of six lectures each, for a fee of from ten to fifteen guineas, and the proportionate fees from students by which these sums would be raised need be very small. The existing classes which were already working in the desired direction could be utilised in connection with these lectures without interfering with their independence, and a new class formed (and, in the committee's scheme *d*) for "Preparation and Criticism of Plans, Specifications, and Estimates," on the basis of the class of construction. The Association classes ought, however, to be still arranged as at present, and for the benefit of the members in general, and not exclusively for those preparing for the examination. The committee further suggested that the lectures should be rather to indicate a course of study than exhaustive discourses, and that each subject should be divided into two courses—Elementary and Advanced—to be given alternately, with a fortnight's interval. Prizes of three and five guineas should be offered for the best and second best résumés of the series of lectures, to be awarded on the recommendation of the lecturer, and at the close of each course an examination should be held by the lecturer.

It was agreed that the committee's scheme be announced to the members through the medium of the "Brown Book," together with the papers of the Institute Examination.

THE ASSOCIATION TRAVELLING STUDENTSHIP—FIRST AWARD.

The following report as to the award of the recently-organised A.A. travelling studentship, was presented by the examiners, Messrs. Thomas Henry Watson, George Vialls, and Ernest C. Lee:—

We have carefully examined eight sets of drawings, submitted by the following gentlemen:—H. O. Cresswell, A. W. Cross, F. G. F. Hooper, G. H. Ince, H. H. Kemp, C. H. Marshall, W. A. Pite, and G. S. W. Tappen.

We think we may fairly congratulate the Association upon the general excellence of the work, especially in view of the fact that but a short time has elapsed since the foundation of the studentship was announced. This is now the most important of the many prizes the Association has to offer to its members, and while we venture to think that the response the first invitation has called forth cannot fail to be gratifying to the contributors to the fund, we trust that in future years a still higher standard of excellence may be attained, and also that the interest in the competition may be still more widely diffused.

Some of the competitors have failed to adhere in all particulars to the conditions, but, availing of the liberty given to the judges for this year by the notice appended to the sheet of instructions, we have not placed too strict an interpretation upon the rule regulating the number and description of the drawings to be submitted. It may be well, however, for us, in the interest of all who may be looking forward to future competitions, to call attention to the fact that hereafter *all* the conditions will be most strictly enforced.

We have unanimously awarded the studentship for 1881, to be accompanied by the bronze medal of the Association to Mr. Henry Hardie Kemp, and on the evidence of his drawings we fully believe he will make the best possible use of the opportunity for further study and progress.

We also recommend to the committee that prizes be awarded to Mr. Francis G. F. Hooper, and to Mr. William Alfred Pite for the admirable series of drawings submitted by each of those gentlemen.

Messrs. Kemp, Hooper, and Pite were presented, amid great applause, to the PRESIDENT, who congratulated them on the character of the work which had, he said, set a high standard for future years, and mentioned that, in consequence of this excellence, special second and third prizes would be awarded of a bronze medal and two guineas to Mr. Hooper, and a bronze medal to Mr. Pite. The President added that had the funds permitted, the awards to the second and third competitors would have been more substantial, and he hoped that further subscriptions would flow in so as to enable the judges to increase the amounts next year.

Mr. J. DOUGLASS MATHEWS proposed a vote of thanks to the retiring president, remarking that they were deeply indebted to Mr. Lee for the warm interest he had taken in their work for many years past. Mr. Lee was to be congratulated on the fact that during his term of office they had successfully founded a principal prize in the travelling studentship, had seen it heartily taken up by the members, and had been able to award the prize after a competition in which the drawings were of a gratifying character. With this vote of thanks he should like to couple one to the senior secretary, Mr. R. C. Page, who, it would be generally regretted, had decided to retire, after several years of indefatigable and unsparing hard work. Mr. GOTCH having seconded the motion, it was carried amidst prolonged applause, and was suitably acknowledged by Messrs. Lee and Page.

DECORATION AS APPLIED TO ARCHITECTURE, FROM A PAINTER'S POINT OF VIEW.

A paper on this subject, written by Mr. Corbett, who is now in Italy, was read by the President. The first portion will be found on p. 719.

Mr. HUGH H. STANNUS supplemented the paper by a short one, intended as an explanation of the series of coloured sketches and diagrams, engravings, and photographs of Italian decoration, he had been able to furnish from his collection on two days' notice. He remarked that Mr. Corbett had not stated that the design and arrangement of the ceiling at Segnatura were due not to Raphael, but to a Sienese artist, named Buzzi. A copy of this beautiful ceiling existed at the back of the Italian Court in the Crystal Palace, and although it was blocked up by subsequent screens, it would well repay ex-

amination, as it was executed by the late Alfred Stevens. In dealing with large figure subjects on curved surfaces, it was necessary to bear in mind that the figures, if upright, must not be larger than the lower half of the quadrantal curve of cove or dome; if they exceeded this proportion, they oversailed the space, and seemed about to fall on the spectator. Mr. Stannus concluded a half-hour's conversational address, illustrated with frequent blackboard sketches, by proposing a vote of thanks to the author and reader of the paper.

Mr. GILBERT R. REDGRAVE seconded the motion, adding to it the name of Mr. Stannus, for his illustrations and interesting appendix, and the joint vote was carried by acclamation.

ELECTION OF OFFICERS, 1881-2.

The result of the voting for officers for next session was announced by the President, as follows: President, Aston Webb; Vice-presidents, Gilbert R. Redgrave and L. C. Riddett. Members of Committee: Cole A. Adams, E. C. Lee, C. Henman, R. E. Pownall, H. H. Stannus, E. B. I'Anson, E. G. Hayes, R. C. Page, C. R. Pink, and T. E. Collcutt. Treasurer, J. Douglass Mathews; Assistant Treasurer, T. Wilkins. Secretaries, F. E. Eales, and W. H. A. Berry. Librarian, Hampden W. Pratt; Assistant Librarians, R. L. Cox and W. Barrell.

VISIT OF THE ARCHITECTURAL ASSOCIATION TO GREENWICH HOSPITAL.

LAST Saturday afternoon the Architectural Association paid a visit to Greenwich Hospital, which was the last excursion of the season. Anticipations of seeing the hospital in a more thorough manner than is accorded to the general public, naturally brought a large number of members together, with the eager expectation probably, among a few, of seeing a great many interesting points of the building. The clerk of the works, Mr. Loughborough, conducted the visitors through the painted hall and chapel, after viewing which, the remainder of the time was, it must be said, rather aimlessly spent in ascending and descending numerous flights of stairs, walking through long corridors, and the class-rooms, lecture-theatres, and laboratories of the vast establishment now converted into a Royal Naval College. So far, indeed, the visit was more of a pedestrian exercise, and owing, perhaps, to the idea that it was better to show all than to do the thing by halves, the members were taken through each block from the basement to the attics, though we were not sure they profited much by so rapid and detailed a review of the building.

It is perhaps not generally known that a Royal palace formerly occupied the site, and Charles II. so liked the situation, that he rebuilt the residence and improved the gardens. He erected a great portion of the present hospital as a palace after his restoration, which was remodelled by William and Mary in 1694, as a retreat for seamen. In 1705, the buildings were sufficiently completed to admit of 100 disabled seamen, and the income reached in later times the sum of £159,000 a year. The plan was furnished by Wren, and, as Macaulay graphically alludes to in his History, "Soon an edifice, surpassing that asylum which the magnificent Louis had provided for his soldiers, rose on the margin of the Thames." William claimed no part of the merit of the work, as the frieze round the hall ascribes it to Mary, who conceived the idea for the wounded after the battle of La Hogue. The monastic kind of life not being considered good for the old "salts," the asylum was converted into the present Royal Naval College in 1865. Examination of the ground-plan shows that the hospital forms really four large detached blocks or edifices, named respectively King Charles's, Queen Anne's, King William's, and Queen Mary's buildings. The two former have their ends to the Thames, and inclose a large square or area between of considerable width. The two last blocks on the south side have a narrower interval between them; these are flanked internally by stately colonnades, and the entrances are crowned by the well-proportioned cupolas which make this pile so grand and picturesque a mass of building from the Thames, though Mr. Fergusson has spoken in very disparaging terms of the clumsy three-quarter columns and ill-proportioned attic and useless pediments of the river-front. The painted hall, which forms the principal apartment, occupies the main end of King William's building, and the chapel and corresponding wing that of the Queen Mary block. It is approached by the colonnade entrance, through the lofty vestibule, decorated with columns of the Corinthian order, forming the base of the cupola on this block. The hall, or naval gallery, is nearly a double cube, and its dimensions are 106ft. by 56ft., and 50ft. high. The flat painted ceiling, executed by Sir James Thornhill in 1707, is, of course, the chief attraction, and few English painted ceilings surpass this in design and richness of colouring. The great group of figures in the centre oval panel represents William III. and Mary, surrounded by national attributes. The outer groups are emblematic of the seasons; signs of Zodiac, the elements, and numerous trophies of a naval character fill up the composition. Few of the visitors examined the fine series of portraits of naval commanders arranged round the walls, or the chronological series of pictures of great naval battles. The colouring of the interior is dark, and it is contemplated, we hear, to redecorate this hall as well as the chapel. The landing of William III. at Torbay, portraits of George I. surrounded by allegorical figures, with the dome of St. Paul's, and a variety of florid accessories of national character fill the walls of the upper hall. The present decorations were executed by Mr. Clarkson Stanfield, R.A. The chapel in the next block, approached by an octangular vestibule under the dome, is a spacious building lighted on both sides, and chiefly of interest in having been carried out from the designs by the late J. Stuart, the well-known author of the "Antiquities of Athens," in 1789, the former edifice having been destroyed by fire in 1770. As may be expected, the details are thoroughly Greek, and the ornamentation exceedingly delicate and refined. The flat segmental ceiling, divided into three main compartments by wide bands, enriched by Grecian foliage, is a good specimen of the age. There is a valuable painting by West over the altar, of the "Shipwreck of St. Paul," and the spaces between the windows have figures of the Apostles and Prophets. It is to be hoped when the chapel is redecorated, these figures will be repainted a darker tone, or the windows filled with glass of a subdued tint, as the bright light from the clear glass now completely obscures these decorations of the interior. A little regilding might be judiciously applied to the ceiling and pilasters, and to the elaborate decorations of the groined plaster ceiling of the gallery with their cantilever supports.

The class and examination rooms, the physical and chemical lecture-rooms, and laboratories of King Charles and King William's-buildings, take the place of the interior fittings of the old seamen's hospital. The lecture-rooms are generally placed at the ends and the series of class-rooms between. These seem to have been fitted up in a useful and substantial manner, but we hardly think the ventilation of some of these class-rooms, especially the laboratories, has been sufficiently attended to, as many of them were close, and smelt strongly of the fumes of chemicals. The museum, afterwards inspected, is itself a school replete with models of ships of the most beautiful kind, and our naval engineers and architects would do well to visit it. We also noticed several valuable original designs and sepia sketches by Benjamin West, R.A., for the painted and sculptured decorations in the chapel on the walls of the upper gallery.

PRACTICAL NOTES ON PLUMBING.

Dedicated to "Society Plumbers." By P. J. DAVIES, H.M., A.S.P., &c.

CHAPTER I.

INTRODUCTION.

I PRESUME your readers are sensible of the fact that health and life are, in a measure, dependent upon our plumbers' work, and, therefore, you cannot be too particular about having first-class work, and, in order that you shall be better able to judge rightly, it is important that you should understand both the theory and practice together with the old and new style of doing the work. I may here mention that I have made plumber's work my *particular* study for this last quarter of a century, and have spent thousands of pounds in teaching myself not only the practical part but chemical and theoretical work, together with the best methods of doing the same; also in order to obtain the historical parts of the work I spent the greater part of 1876, 1877, and 1878 in the Great Seal Patent Office, British Museum, and South Kensington Libraries, &c., gleanings wherefrom I shall place before you in order that you may determine for yourselves whether we are advancing or retrograding.

THE WORKSHOP.—IN OLDEN TIMES KNOWN AS "THE PLUMBERY."

The engraving on next page, Fig. 1, shows an old-fashioned plumbery or plumber's shop. Now compare this with the present style of plumber's shop, and say if there are more than half-a-dozen such shops in London? Next.—How many plumbers are there in London competent to work the tool or frame shown on the left-hand side of the engraving, and how many more are there that ever saw such a thing? although one of the best tools that ever plumbers worked with. I think I hear you say that we have no use for such nowadays; but we have, as will be explained hereafter, and every *plumber* should know the rudimentary work, if nothing more.

As the old apprentice boy's primitive work was to fire up the pot, it is clear that, by way of a start, he should know something about this. The pot for casting should be large enough to run down at least two tons of lead; it is set like a copper; but care must be taken to set it in such a manner that you can get fire all around the sides and bottom, with a good damper, and at least a 9in. flue. It is most important a hood should be fixed to convey away all fumes.

"SHEET"-LEAD CASTING.

Fill the pot before lighting the fire; the heat given off from the metal passes amongst the lead and dries the same. Never put *damp lead* into the fluid metal, or you may find the contents taking wings unto themselves as the lead did from a large pot which was being used for pipe-laying when a mischievous boy threw a snowball into it. Now, whilst the lead is getting hot let us examine the frame previously referred to. *a*1 is the bed, made with about 2½in. or. 3in. deals, having a quantity of 3-16in. holes 3in. apart bored into them; the bed is generally about 12ft. to 15ft. long and about 5ft. to 6ft. wide, having a fall of 1½in. to 2in. in 12ft. from head to foot, *a*6 to *a*1 (see engraving). The stand-up sides are the "shafts," which should be kept quite true and smooth, also protected with a sheath when not in use. *a*4 is the "head-pan," best made of copper, although often made of iron. This head-pan should be made to work on hinges as at *a*7; *a*6 is the tipping handle, sometimes pulled up with a crane, other times with an iron bar; *a*11 is a strip of wood to keep the sand up; *a*12 the rest-prop for head-pan, *a*5 the sand-box, *a*8 the foot-pan. In some frames we have a "mid-pan," which is, of course, for short sheets or other castings; but with a very little trouble you can take out one of the bed deals and shift the foot-pan to any part you choose. The height of the frame varies from 2ft. to 2ft. 6in., but the lower the better, as you can reach over to plane much more easily.

THE COACH.

This is only a kind of oblong pot, shown at W, made to run on wheels: it must be strong enough to carry a ton of lead. Its use is to catch the surplus lead which may run into the foot-pan and to truck it back to the pot.

SAND-BOX.

This is shown at *a*5. It should be air-tight at the bottom, so as to keep the sand as near as possible to the right dampness. V, "the plane," made of copper.

THE STRIKE.

*a*2 is the strike; this is rather an important tool, made as follows:—Take a piece of dry, solid mahogany about 18in. longer than the width of the frame, and notch it down, as at Z, to within 1in. of the bottom of the frame; make the bottom part a little rounded, round the ends for handles, and have some leather muffs made to slip over the ends in such a manner that it will readily take off or on with laces. In order to hold a piece of lead between the handle and muff hereafter to

be explained, you will require a shovel, sieve 1-32in. mesh, and watering-can with very fine holes.

THE SAND.

As there are many opinions as to the best kind of sand for lead-casting, I will not force my own on the trade, but that of a gentleman more advanced in years and experience than myself, and one who is (as I think) the best lead-caster for the trade. I refer to Mr. Grayham; his advice to me is as follows:—"Take common-washed sand, which is generally pretty sharp, and mix with a little loam so that it shall bind a very little." During the time I was at my old works at King's Cross, I used the Highgate sand, and found it very handy; but the above gentleman's advice will be useful in any part of the globe.

MAKING UP THE BED.

Having all these things before you, first damp and sift your sand and strew it over the bed at least 1in. thick; take the strike with the muffs on, and level the sand truly over the bed, the size you require the sheet, but do not make it too wet. If too wet the lead won't run, it splutters and blows; if too dry it won't bind, but breaks up, won't enamel, and the sheet will be rough on the sand side. Experience and practice are the only teachers which will enable you to ascertain the required dampness.

BEATING.

Next take the strike, you at one end and your mate (not labourer) at the other, across the frame; begin at the foot and beat the sand down as firm and even as it is possible until you are at at the top, after this, with the strike, skiff the sand, that is by spreading, as it were, the sand smoothly backwards and forwards. This brings the sand level with shaft.

PLANING.

After the skiffing is over take the plane V, (Fig 1), and dip it into the pot to make it hot, then rub some touch (candle grease) over the face of same, and thoroughly level and smooth the sand; keep at this until you cannot get smoother, in fact make it shine so that you may see your face in it. Finishing at the foot of the sheet, let the sand at the foot finish very sharp, so that the excess lead shall leave the sheet instantly and allow it to contract without pulling away at the surplus lead, otherwise it will crack right across the centre of the sheet. The sand and bed being ready, how is the lead? is it getting hot? Place the coach as shown, and wipe all the sand off the strike, next "pack it up" as follows:—Suppose you want 7lb. lead, then place a piece of 5lb. lead between the muff and the handle (as shown at Z and 9) of the strike; this will leave a thickness for the lead. Remember this: that if you want 7lb. lead your packing will be 5lb., if 6lb. then 4lb. is required, and so on—in short, always allow 2lb. lighter lead for packing than you require to get off the frame, unless under special circumstances. The lead is HOT; bale quickly from the pot into the head-pan. If too hot, it will run too freely and break the sand; if too cool, it won't move. This very much depends upon the lead, if lively or not. It also very much depends on the day, also the state of the sand, and of course the help you receive; experience attained by practice is the main point for success. A cold or windy day is dead against the *work*. A too hot day is as bad, for you cannot keep your strength up; you must have your heat accordingly. The heat is ascertained by the aid of the testing stick, a piece of wood about 18in long and 2in. square or so; put it into the lead and work it about, holding it at an angle as you take it out: if the lead just hangs on the stick it is right. Keep the lead well stirred up from the sides of the head-pan, in order to have uniform heat; if too hot, stir it with some cold plumbers' irons (N, Fig. 1). Be careful and have everything ready at the moment; if the sheet is to weigh 5cwt., then you will want three times this amount of melted lead.

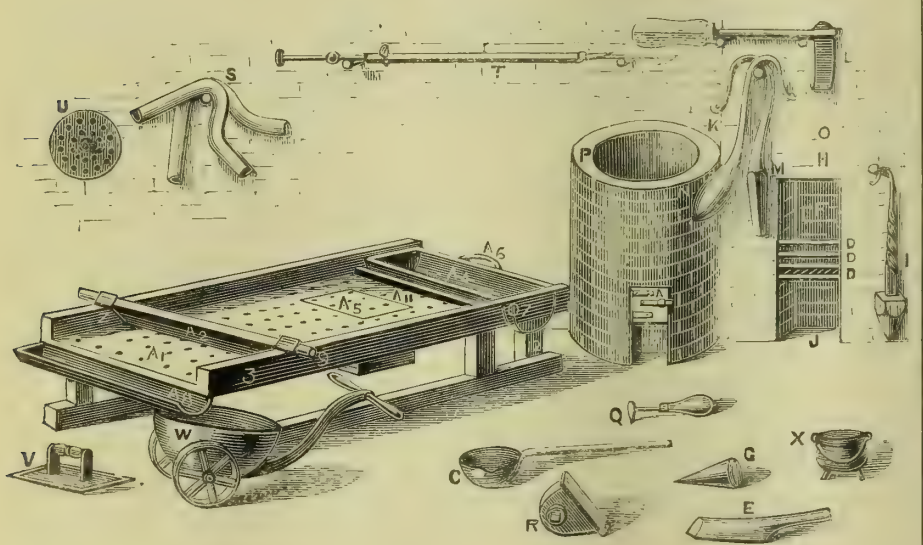
A word or two with regard to the strike: you see it is across the frame, as it now stands; so it should look when the lead is going down the frame. One man at each end presses on the shafts and keeps the strike from twisting by the stiffness of the grip, and must, as it were, fly after the lead, pushing it forward as fast as possible; be sure to keep the strike down and level. Place your strike at the head so that you may take it instantly; well *touch* the edge first.

"THE LEAD'S JUST RIGHT."—"TIP"—it is going down the frame, you after it with the strike, leaving nothing behind but just the required thickness for your sheet; it's in the foot pan, into the coach, run the coach to the pot, bale back the surplus before set, all's well and all eyes anxiously looking upon the sheet. It being the first, it's a good one; then as quickly as possible rip or trim off the salvages—that is the rough parts off the sides and ends, roll it up and make up your mould for another sheet; remember you have to get off from five to six sheets a day for good work. A crane will be necessary for this amount of work.

If by chance you cannot get the surplus lead away from your sheet just before it contracts, divide the sheet from the surplus mass by drawing a knife across the same.

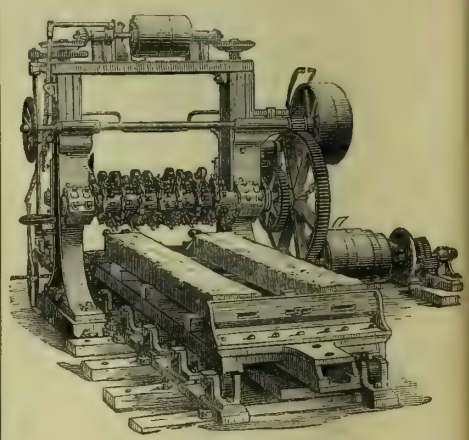
(To be continued.)

FIG. 1.



HOLGATE'S MECHANICAL STONE-MASON.

THIS machine, which is the invention of Mr. James Holgate, of Burnley, has now been practically tested in several large contracts, and is pronounced a success by all who have used it. Five of the machines are at present in operation at Burnley, and two may be seen in constant work at Mr. Altham's new buildings in that town. The mechanical stone-mason will turn out from ten to fifteen times as much work as a journeyman can get through, or about 300ft. superficial in nine hours at a cost of not more than one penny per foot. The machine consists of one or more revolving cylinders, made to rotate in the same direction, and placed one behind the other, each cylinder having different widths of cutters fixed in them—the first having narrow cutters to take off the rough; the second, &c., having broad or other suitably-shaped cutters to finish it, this being accomplished at one operation. These cylinders, by means of gearing, &c., can be either raised or lowered jointly without altering the relative position of the cutters, or separately by means of a hand wheel, and still remain in gear. The table or bed carrying the stone has both a quick advance and return motion by means of open and crossed belts, and also a slow motion from the same source for cutting purposes, brought about by means of a friction cone carrying a long revolving pinion working in gear with two cog-wheels of varying number of teeth, one of which is a dead wheel and the other keyed on the shaft for driving the table. The stone having been adjusted and the chisels fixed so as to project to the same extent, the machine is started, and the bed-plate gradually moves forward. The cylinders holding the chisels at the same time revolve, and, as a result, the stone is planed as completely as a carpenter would rough-plane a board. A second cylinder, situated immediately behind the first, and which contains a less number of larger and wider chisels, next comes in contact with the surface of the stone, and takes off just sufficient to leave it perfectly smooth and even in appearance and fit for immediate use. When the stone is finished the machine can be promptly stopped, the cylinders lifted by a handle at the side, the bed-plate brought back with a very easy motion, and then the blocks are ready to be lifted off. The



machine, of which we give a sketch, will in no short time be found in use by all large contractors, as it not only accomplishes its work well but so far as we can see is not liable to get out of order.

LUDLOW: ITS CASTLE AND NEIGHBOURHOOD.

[WITH LITHOGRAPHIC ILLUSTRATIONS.]

TO the architectural student and archæologist, both the town of Ludlow and also the surrounding neighbourhood are replete with the greatest interest. Situated as it is in the midst of some of the most beautiful scenery to be found in England, seated in a commanding position on the summit of a small hill, partially encircled by a bend of the river Teme, and overlooking extensive views of the lovely valleys of the Teme and Corve, Ludlow possesses advantages of position and scenery that few places can lay claim to.

Apart from the historical interest attaching to the place itself, and which was in the main conferred by its once important Castle, the town abounds with half-timber houses, which, in many instances, are hardly equalled, and certainly not surpassed, by any in this district, celebrated as it is for half-timber work, and not even to famous Chester itself can the palm be allowed for superiority in several respects.

The surrounding country is also studded with points and objects of interest to the architectural and antiquarian observer. Tumuli, Roman en-

campments, buildings—ecclesiastical, civil, and military—dating from the Conquest upwards, and exhibiting some of best preserved representative specimens of the different periods of English architecture, are to be found profusely scattered over the district lying within a few miles' radius of the town. Considered as a field for student labour, few places can present more attractions, so much *representative* work being contained within a comparatively small area. To any of my younger brethren who may, during the next season, find it difficult to decide the momentous question of "where to go," I would strongly recommend Ludlow. It will be found a most useful centre, and would amply repay a visit, if for no other purpose than to enjoy the country, which is in itself a treat and well worth visiting. The architecture of the district has hardly been illustrated at all, that is to say, by carefully drawn and measured sketches and drawings. Artists have long found the town itself and the beautiful scenery around to be a mine of artistic wealth, but from the professional point of view, the whole neighbourhood is, comparatively speaking, unknown.

Ludlow, one of the towns of the *Marches* (so called from their being on the limits or borders of England and Wales) is of very great antiquity. It is supposed that a colony was founded here by the Danes in one of their marauding excursions, and known as *Den-a-ham* or abode of the Danes, since contracted to Dinham, a name that a portion of the town still bears. Be this as it may, on coming to the castle we find considerable remains of Norman architecture. The Keep is a very good specimen of the period, and contains much interesting work; but as I am not at the present prepared with drawings illustrative of this portion of the buildings, it will suffice to say that although during the lapse of time, the keep, like the rest of the original work, was altered and re-altered to suit the tastes or requirements of successive possessors or holders of the castle, yet the main structure of the tower still retains its distinctive characteristics, and in great part it is possible to trace the arrangement as it was first built.

Before leaving this part of the ruin, however, I may mention a case of that species of *indifferentism*, so to speak, on the part of the present proprietor of the castle, which one also meets with occasionally elsewhere. There is on the W. side of the keep a small chamber approached by a winding passage in the thickness of the wall. This passage, having been literally choked and blocked up by the rubbish, sticks, &c., brought in and deposited by many generations of jackdaws, on being cleared out, was found to lead to the chamber mentioned, and therein were found, I am informed, many articles of interest. A narrow window lighted it, but had been so overgrown and obliterated by ivy that its very existence was unknown. On the other or E. side of the tower there is evidently another chamber, probably corresponding in general arrangement to this one, but into which there is no entrance, its passage having been blocked with masonry during one of the many alterations. I think it is quite reasonable to suppose that this "closed casket" may contain some pearl of price to the antiquarian; but up till the present there it remains, and from what I learn, is likely to remain to tantalise his curiosity, although a few hours' mason-work would set the interesting question at rest.

In the inner court or green of the castle is the round Norman chapel, the third only of its kind in England, and second in importance to that of our own Temple Church (G on plan). This venerable sanctuary is, considering the amount of weather it has been and is exposed to, in a wonderfully good state of preservation. It is arcaded round internally with columns carrying alternate chevron and plain arches richly moulded.

The chancel has entirely disappeared, although its position and extent are clearly traceable. Some of the colouring was to be seen until recently on the remnants of plaster underneath one of the arches in ascending; but this has either faded completely away, or been picked off by some visitor as a memento. Sir Henry Sydney, during his residence here as Lord President, formed a gallery from the apartments nearest to this chapel for the use and benefit of the ladies of his household, but this has long since been removed; the doorway, however, leading from it into the chapel itself, yet remains, having been formed in one of the original Norman windows.

The chancel-arch, richly moulded and decorated with billet and chevron, is a really wonderful piece of construction, as the shape of the arch had to be preserved at the same time with the sharp curve of the circle on which the building is described.

Coming now to the middle period in the building age of the castle—viz., the Edwardian, we find that here are the most extensive and important parts of the edifice. The State apartments, the banqueting-hall, and council chamber, together with numerous other rooms and offices, and the various uses of which can at the present time only be guessed at, all belong to this period. These are comprised in one large block with an outside tower at each end, and face N.W., being built for greater security on that part of the rock which is steepest, and therefore most difficult of approach in case of siege, &c.

The enlarged plan and the interior drawing show that part of this block of building which is known traditionally as "Prince Arthur's Apartments" (although I am not aware whether any better authority exists for so naming it), and contains many points of interest. (On block plan H.) It is difficult to discover exactly into how many different chambers this now empty shell was originally divided, but apparently it contained some eight or ten rooms of varying size. The positions of the two main floors are clearly indicated by the corbel tables that supported the joists, and the height and spread of roof are evident by the label mould on the left hand at top. Much of the plaster work remains, as will be seen from the dotted irregular-shaped patches, but whether belonging to this date or added afterwards is now impossible to determine. This plaster is peculiarly tough and adhesive, having a considerable quantity of hair in its composition, and although, as a rule, laid on in what we should now consider to be extraordinarily thin layers (averaging about $\frac{1}{4}$in. in thickness), yet it has proved itself to be so durable that in many cases it yet remains as good as when first set.

The window-doorway, giving admittance to the inside wall passage, containing closet, is shown on the extreme left. This doorway would be reached in all probability by a short flight of steps (wooden), rising from the floor below, and some 18in above the corbel shown in angle. The small arched opening on the ground, also to the left hand, is the entrance to a wall passage or tunnel, which extends onwards and upwards, until it has reached the underside of the skew window in angle, where at a later period it has been blocked up with masonry. The crown of the arch of this passage is visible under the sill of the window where the stones have become displaced.

Opposite to this entrance is the corresponding archway of a passage running in the other direction. This is somewhat longer than the former one, although it likewise is blocked, a small circular stair having been built into it later. It is difficult to assign an exact purpose to the two wooden spikes projecting from the wall and shown on the left, but their most probable use has been to hang armour or other things upon. The most trying problem, however, in this part of the castle is to discover the *raison d'être* of the irregular square-shaped well (I on plan).

At the level of the plan it undoubtedly formed a small chamber, with yet two others above it, but from the sill of doorway in the passage (K) the depth even now is 16ft. 3in., and the present bottom being composed of loose stones and *débris* that have fallen from above, the actual bottom or floor would probably not be less than from four to five feet farther. It has been suggested that this lower part may have been used as a dungeon; but to my mind this is not a satisfactory conclusion, on account of the total absence of any inlet whatsoever for air.

I believe I am right in saying that the British Association visiting here on one occasion were compelled to give up the solution of this question in despair.

At the point marked (L), and in the window, is a stone channel for pouring molten lead and boiling oil on the heads of besiegers. This window would be just above the floor on plan level.

The small, ivy-covered turret shown in centre of drawing was the beacon tower. It is of solid masonry, with which, however, the ivy has been and is playing sad havoc. A portion of the circular stair by which it was approached is shown beneath, and on plan (M).

Three large deeply-recessed traceried windows on the opposite sides to those shown give light to the main rooms on the upper floor; one of these, however, has been blocked up with dry masonry.

The brick arch to fireplace belongs evidently to the Elizabethan time, as a considerable amount of small jobbing brickwork of that period appears in the state apartments and elsewhere. In the upper fireplace a mass of this brickwork is shown, although why placed there and for what purpose intended is by no means clear.

All the detail is good and bold, and of very considerable substantiality, as will be apparent by looking at the sections of corbels, fireplace, and window-jambs, window-seats, &c. On the plastered soffit of an arch on the ground-floor underneath the window (marked N on plan), there exists part of a monochrome painting, evidently intended to be a representation of the beacon-turret, with its fire-box, &c.

It was to Ludlow Castle that Prince Arthur, the eldest son of Henry VII., brought Katharine of Aragon after their marriage, and if tradition be correct, inhabited this portion of the state apartments. Could these now dead walls be endued with speech, what wondrous accounts might they not give us of the doings that befell during the time that the poor young prince "held a court of great splendour" in celebration of his nuptials. The marriage, according to Speed, had been solemnised at St. Paul's Church, when "the Archbishop of Canterbury, assisted with nineteen bishops and abbots mytred, joined their hands and performed all the other Church rites upon that great day."

However, the boy husband did not live long to enjoy his happiness, dying of consumption in the following year at the age of 16. (He was 15 when married and Katherine 18.) His body was buried in the cathedral church of Worcester, and, according, to tradition, his bowels and heart were separately entombed in the chancel of Ludlow Church.

How Katharine was afterwards married to the Eighth Henry to prevent her dower going out of the kingdom, and becoming the mother of Bloody Mary (Mary, by the way, was sent by her father to hold a court at Ludlow as Princess of Wales before the first verdict of illegitimacy was given against her) left such an awful legacy to England, the divorce, her life and death at Kimbolton, and the burial at Peterboro'—is it not matter of history?

The third and last building period for Ludlow Castle arrived with the advent of Sir Henry Sidney, the celebrated father of his yet more celebrated son, Sir Philip Sidney, who, on being installed Lord President of the Council of Wales by Elizabeth (1557), took up his abode in the castle, and seems to have at once set about making various extensive alterations and additions in order to accommodate his numerous retinue and following. Besides building an entirely new wing, extending from the keep eastwards, and now known as the "Sidney Apartments," see plan (C), he utilised the older portions (Norman) of the castle for domestic purposes—the kitchens, bakery, and servants' offices generally.

The vast oven with the baker's apartments over are still in existence in the tower, marked (D) on plan. As I hope to give at a future time drawings of the Sidney wing, I will not now attempt any description of this once fine building, farther than mentioning that it was in a little room over the entrance gateway in this part of the castle that Butler afterwards wrote the first part of "Hudibras." Sir Henry Sidney, during whose presidency the castle appears to have enjoyed its highest state of prosperity and splendour, died in 1584 or 1586, and was buried, according to his own directions shortly before death, in the curious part-and-parcel manner then in vogue for disposing of the bodies of the great. We are told that his heart was buried at Shrewsbury, his bowels at Bewdley (where he died), and his body at Ludlow in the tomb of his daughter, Ambrozia. As a curious circumstance in reference to the statement that his heart was buried at Shrewsbury, I may mention that in 1793 a small leaden urn was discovered in the garden of a gentleman at

Leominster, distant about forty miles from the supposed place of sepulture of the heart. The urn, which was about 5in. deep and 4in. in greatest diameter, had originally possessed a cover which was then missing. It bore an inscription, of which that in illustration is a copy, the punctuations or separating points being formed by hearts. If this is to be depended upon for the date, it would appear that he died in 1586 instead of 1584, as generally understood. I am not able to say what was the fate of the urn, or whether it is still in existence.

During the Earl of Bridgwater's presidency in 1634, the Masque of "Comus" was for the first time represented in Ludlow Castle, and the room known as the Council Chamber (60 by 30, O on block plan), into which the three doors shown on large plan to right-hand open, is credited with the honour of witnessing this first performance. Most readers will be familiar with the incident that gave rise to this beautiful creation of the author of "Paradise Lost."

From this date the sun of the prosperity of Ludlow Castle seems gradually to have declined until we find that in 1703, one Captain Jones, who was then governor of the castle, would appear to have looted his charge for the benefit of his own house (now an inn called the Feathers, as in it are to be found much rich carving, patch-worked in all sorts of ways, and boasting, amongst other things, a Royal coat of arms). Many other houses in the town are also beautified with various carvings and pieces of furniture that undoubtedly were procured from the castle.

Samuel and Nathaniel Buck, in their "Antiquities," writing in 1774, and giving a short description of Ludlow Castle, say, at that date: "Many of the Royal apartments are yet entire, and the sword of State, with the velvet hangings and some of the furniture, are yet preserved; but since the appointment of a lord-lieutenant, the office of lord-deputy is discontinued, the court is dissolved, the castle neglected, and in all probability will soon fall into decay." This has been verified, and now all that remains of the once famous pile are the stately ruins fast crumbling away, and destined probably within the lapse of another hundred years to present little more than a bare outline of what now even exists in some degree of preservation.

THEODORE A. HOWARD.

THE SCIENCE AND ART OF SANITARY PLUMBING.—III.

TRAPS AND TRAP VENTILATION formed the subjects of Mr. S. Stevens Hellyer's third lecture on "Sanitary Plumbing," delivered at the Society of Arts room on Tuesday evening, under the chairmanship of Professor Corfield, M.D., M.A. There was, as before, a very full attendance of plumbers, who followed the simple experiments made by the lecturer with evident interest, and frequently interpolated questions. Mr. Hellyer said he should confine himself in his lecture to the general traps most largely used for disconnecting waste and soil-pipes, as in examining these he should touch on the principles of nearly all the traps in use. Before going into the merits or demerits of particular traps he would first prove the necessity for traps of some sort, and in this he believed he should have the sympathy of all plumbers, and the support of their chairman. At the present day some men, few and far between, were condemning the use of traps altogether, and not only denounced them, but practised what they preached in their treatment of sinks, lavatories, and w.c.'s. He considered the advocates of open pipes were utterly wrong in their teachings. When waste-pipes were as open at both ends as tunnels, what was there to prevent them from acting as ventilating-pipes, especially as the house-end of the pipe was generally in a warmer and more rarefied atmosphere than the other? When this occurred, and it took place directly the waste discharges had been conveyed, the fires in the houses were fed with air of questionable freshness or purity. If such waste-pipes could be kept perfectly sweet, no danger would arise, and it would save lazy servants the trouble of opening windows; but since it was practically impossible to discharge foul water through pipes without fouling them, there could be no safety where trapless waste-pipes were adopted. Let them take the case of a scullery sink. The servant threw down into it a body of green-water, hot from the saucepan, and before the waste-pipe was dry, she turned a tub of hot greasy dish-water into the sink, with the washings-out of the dripping-pan, and after washing her hands, threw the soapy water away. The whole stained their way down the sides of the waste-pipe, the suds adhering all the way down to the greasy matter already formed upon it, and "bubbling" off in bad air to return into the house. He should like these anti-trap men to push a pockethandkerchief through such a waste-pipe, and then to wipe their noses with it. Would any of these men drink a glass of water after it had passed through such a waste-pipe? And yet they did not mind the occupants of the scullery breathing the air which had come through such gulley-pipes. To prove that grease, &c., adhered to the sides of a waste-pipe, the lecturer washed his hands in a hand-basin having a waste-pipe connection of glass tubing. Having passed round the pipe, which was not only discoloured by the passage of the soapy water, but also smelt of soap, Mr. Hellyer said if he had used an iron instead of a smooth glass pipe, the amount of deposit would have been much greater, and yet iron pipes were frequently fixed, not alone in cottages and jerry buildings, but in mansions. Using a lead waste-pipe, some soapy water was poured through the basin; the pipe was then disconnected, and a wire with attached sponge threaded through it, rendering the sponge soapy. As a further demonstration of the theory (for the lecturer observed he had been charged with not being practical) a piece of waste-pipe was exhibited quite corroded from long use. Where good hot-water flushes could be sent through lavatory-pipes they would be kept tolerably wholesome; but, even then, they should be trapped; and most people forgot to flush out lavatories after using them, and the mouths of pipes were so contracted, and the house connections so small, that flushes were inefficient. In a gentleman's house, only recently built, and with its sanitary arrangements carried out under the rules laid down by the Croydon Local Board of Health, the lecturer tested, by an anemometer, the quantity of air which came into the house through an untrapped waste-pipe. Between 9 p.m. and 7 a.m. 8,205 lineal feet of air were registered as having come into the scullery through this pipe. Comment on such a mode of ventilation was unnecessary, and he would pass on to consider untrapped soil-pipes to w.c.'s. Nobody attempted to fix a water-closet without providing some sort of seal between it and the soil-pipe, and though anti-trap men dispensed with the water seal they still used some mechanical means of shutting off the soil-pipe from the closet, fixing an indiarubber or metal valve, plug or stopper somewhere in the closet or on the basin outlet. There were several methods of fixing such untrapped w.c.'s and soil-pipes, and of these he considered that known as Mr. Norman Shaw's (illustrated in the BUILDING NEWS of Jan. 25, 1878) the best, but even this he must condemn. Mr. Shaw was quite right, he thought, in adopting a 3in. pipe, as it could be kept cleaner than a larger one. Although, if large and efficient water-flushes were sent through the soil-pipes after each discharge, it might be kept tolerably wholesome; if for any reason the flush was inefficient, the soil-pipe must become offensive. The handle of a w.c. apparatus was often pulled only just sufficient to discharge the contents of the basin into the soil-pipe, leaving the deposit which escaped out of the closet-basin, with whatever water there was in it, to stain its way down the sides of the soil-pipe into the drain. Then, as the basin-valve would be closed, there would be no flush of water to follow it, to cleanse the filth away, but the excrement would be left to corrode upon the pipe. Again, however learned a person might be in the art of pulling up a closet-handle to give free passage to the outgoing matter, and to open well the flushing-valve, there would at times be no water in the supply-pipe to come into the closet—because of a leaky valve, or repairs to the main, or failure in the waste-preventer or water-valve, or frost. In any case, the pipe would be fouled, and the longer the handle was pulled up the more bad air would come into the house. Again, a water-closet was often used as a urinal, when the handle was rarely pulled up, and the apparatus was corroded. Whatever mechanical means were employed for excluding soil-pipe air, they were sure at times to fail, and would be a source of danger. Other evils attended such a system, as (1) the risk of frost at exposed points, and (2) the difficulty of limiting the length of soil-pipe. Architects did not gain their reputation by designing the elevations of their buildings to suit water-closets. In some buildings the last thing to be considered was the w.c., and hence it was put wherever there was room for it, without reference to the drainage from it. The soil-pipe within the house would be generally filled with bad air, for there would be no circulation of air through it, except what escaped inside the house through the basin-valve when open or defective. (3) The bad air from an offensive dejection would often go out at the soil-pipe and come in at the window, as the soil-pipe head was often placed near a window. Having examined and considered what in his judgment was the more "sanitary" method of fixing untrapped w.c.'s, he would refer to the more dangerous system. It was within his knowledge that the plumbing and so-called sanitary arrangements of a nobleman's mansion had been carried out on the principles he was about to explain, and that, too, within the last twelvemonths. The introduction of stacks of soil-pipes, with trapless w.c.'s upon them was, he believed, the outcome of two or three would-be sanitarians. A tier of trapless water-closets was fixed on one stack of soil-pipe, and this stack of pipes having one, two, or three w.c.'s upon it, might, or might not be, trapped at the bottom. By some men it was trapped and ventilated at top and bottom, but by others it was not trapped at all. In the nobleman's house referred to just now, the soil-pipes were not trapped off or disconnected from the drain, although the lecturer believed the drain was open to the atmosphere somewhere in the grounds. This was the scheme, then: A drain was brought into the house, and branches from it were carried under the floors to receive the various stacks of soil and rain-water pipes. The drain was carried some distance away from the house before it was exposed to the atmosphere; and the several stacks of soil-pipe were continued up through the roof full size for ventilation, with cowls upon them. With such an arrangement there would often be no ventilation at all in one or more of the stacks of soil-pipes. A stream of air, for instance, was passing into the drain at its outlet end, where it had an induct pipe or was open to the air; but this stream of air would have to push its way through or move on with it the colder and heavier air of the drain; it would gradually become very slow in its movements, and the first stack of pipes would take it all away, so that little or no "fresh" air would pass to the second stack to air-cleanse that. Or by the inclination of the main-drain or other local circumstances the air-flushes might miss the first stack of soil-pipes and pass on to others where the influences were greater. It would be easier to point out the stack which would become the chief ventilating pipe than to insist upon each pipe acting equally well as up-cast pipes. In certain states of the atmosphere, the soil-pipes would be acting as down-cast shafts, and at other times there would be no movement of air in them. Excrement-gases and steam from hot water would ascend when the external air was cold, and wherever a defective basin-valve existed this vitiated air would find easy access into the well-warmed house, and in larger quantities when the plugs were raised. By a series of experiments with smoke passed through bent glass tubes having side outlets as well as open ends, the lecturer showed how the air-current might be up one shaft and stagnant in others, or upward in one and downward in another, and how an untrapped closet might allow soil-pipe air to pass through it. Now he would ask, having proved, as he thought, the necessity of trapping all pipes and drains, what was the best means of doing this? All that was wanted in ventilated waste-pipes, soil-pipes, and drains, was a water-lock, and the smaller the quantity of water used for such purposes, consistently with circumstances, the more efficient would be its effect. No sanitary fitting or pipe should be trapped in such a way as not to admit of the whole of the water being entirely changed every time it was flushed. Traps should only act as air-barriers to pipes; but those used were often so badly constructed, and made on such radically wrong principles that they both collected and held their filth, and were in truth

little cesspools. Such an unsanitary appliance was the familiar ⊐-trap. The earliest trap used was, he believed, the ∽-siphon, or round-pipe trap, which he had seen marked on a drawing made in 1775. As this trap in usage was readily siphoned, and plumbers had not learned how to prevent that evil by ventilating it, the ⊐-trap was invented, and came into use at least by 1790. The oldest form, which had its cheeks soldered to the band was extensively used during the first half of this century. The late form had a less sudden rise to the outgo, but was in principle the same. In proof that ⊐-traps were not self-cleansing, the lecturer exhibited some from the Parkes Museum of Hygiene, which were choked up by corroded matter and dried excrement. The surface of a full-sized ⊐-trap which in use got contaminated, was equal in area from 3ft. 9in. to 4ft., or about twice the surface of an ∽-trap. When fouled no amount of water sent through the trap would cleanse it, and the trap became worse and worse with every use. The lecturer showed a model ⊐-trap, having glass cheeks, and poured first soapy and then stone-blue water through it to demonstrate that after several flushings the water in the sides of the trap still retained considerable impurity. Next to the ⊐-trap the bell-trap had been most extensively used during the last half-century—chiefly for sinks, areas, and surface drainage. It was non-cleansing, ill-adapted for its work, and vied with the ⊐-trap in the amount of evil it had achieved. The trench round the stand-pipe of this trap formed a ditch for the filth to collect in, and no flush of water could be sent through the round-holed grating to keep this ditch clear. The fact was that such a trap soon became clogged up, and then to remove the filth or to get a passage through the traps, servants took the top off. In doing this they unlocked the trap and left the house unprotected, so far as that trap was concerned, from the air in its waste-pipe. Thousands of bell-traps could be found in London at this moment with their tops off; but when the tops were on, there was no great protection afforded by them, for the dip or seal was so slight that the water soon evaporated or was drawn out by a piece of rag sufficiently to untrap them. In his next lecture he hoped to bring before his audience the traps which were self-cleansing.

At the close, a Mr. Pullen said, as a practical plumber, he differed materially from Mr. Hellyer's views, and wished to know if discussion would be allowed. The Chairman, after consulting Mr. Hellyer, said it had not been the rule to invite discussion, and he must therefore rule against it. Mr. Pullen and several other plumbers protested against the prohibition of controversy as unfair, urging that Mr. Hellyer's opinions, to which they were quite opposed, would be published to the world and accepted as the general belief of the trade. Mr. Hellyer said he had stated his views, based on experience; if the National Health Society liked to give the first speaker an opportunity of replying to them, he was at perfect liberty to do so. The chorus of disapproval now became more marked and general, when the Chairman rose and suggested that when the lecture was published in the professional journals, every one would have an opportunity of writing to the papers, pointing out what might be deemed to be errors. No lecturer was likely to carry all his audience with him throughout the whole argument; but though he differed from Mr. Hellyer in a few minor points, he must be allowed to say he agreed with him that the present outcry against all traps was based on erroneous ideas. It was hardly worth while to argue that traps were useful in w.c.'s. With regard to sinks, lavatories, and baths, the danger from an up-current was less; but all would concur in saying that such pipes were not desirable channels for the admission of air into a house. In a well-known London hospital it had been found that the waste-pipes, by which the surplus "clean" water, supplied by a company, was discharged, became so offensive that traps had to be introduced. Undoubtedly a ⊐-trap was a cesspool on a small scale, as the lecturer had said, and although plumbers knew that lead was a material which could be perforated in time by gases, yet it was still used; at the Parkes Museum they had a far worse case, in which the fittings were all of zinc, and were connected with an iron pipe. Of course, the zinc became rotten, and sore throats occurred in the house, but typhoid fever did not break out, simply because no person having that disease visited the house; had the germs of typhoid been introduced it must have affected all in such a dwelling. In conclusion, the Chairman referred to the fact that the specimens of plumber's work made in competition for the prizes to be offered at the close of these lectures would be shown free of charge at the International Sanitary and Medical Exhibition, to be held in July next. Votes of thanks were then passed to lecturer and chairman amid hearty applause.

DR. WALDSTEIN ON GREEK SCULPTURE.

LECTURE III.

ON Friday afternoon Dr. C. Waldstein gave a demonstration in the sculpture galleries of the British Museum, in illustration of the theories he has propounded in his lectures before the students of King's College, viz., that the sculpture of the Greeks was practically independent of that of surrounding nations; that it was marked by a perceptible though not continuous improvement in each stage, and that it attained its acme of perfection when the school of Sparta was fused with the school of Athens. Directing attention to an Athenian Apollo in marble (that numbered 31 in the gallery), the lecturer showed that the whole technique was that of a block rudely squared from a tree-trunk, albeit the artist need in truth no longer confine himself to such limits; the figure was erect, the feet set close together, the arms placed at the side, and the head upright. The treatment of the hair and face was so conventional as to remind the spectator of Assyrian work, although the angle of the eye and many other details would prove the European origin of the work. Further, there was the great difference between Assyrian and Greek art that whereas the former was complete and formal, in the latter there was a confession of imperfection and striving after an ideal not yet reached. He must next ask the students to examine the Branchidæ, a series of seated figures of priests and priestesses gradually added in succeeding generations, as ornaments to the approach to the Temple of Apollo Didymeus, Miletus. From their epigraphy as well as from the statements on these pedestals, we learned that the statues were erected at various dates between about 600 B.C. and 520 B.C. They were brought over by Mr. C. T. Newton on his return from the Halicarnassus explorations, and were so re-arranged that, beginning from the north-west corner of the gallery they followed in chronological order. The first in the series was a reproduction in marble of the lines and pose of wood-carving; the next showed some attempt to indicate the folds of the peplos, and as they walked round the gallery they would note a gradual increase of life and character in the statues without detriment to the dignity, and especially observable in the female figures; the texture of thicker and thinner garments was indicated, and what was more important, there was a growingly successful effort to represent the human figure beneath the dress, to indicate the clinging of the garment to an advancing leg or arm, and to distinguish the firm outlines of the male, and the soft and rounded contour of the female figure. The series was one of great value, as showing the steady development of the art, and would repay attentive study. In speaking of the development of sculpture, the student must bear in mind that this was not a continuous but a dynamic progress, having its tidal recession and advance; but in examining a wide series of works, however the individual sculptor might fall short of the standard of his time, they could distinguish a manifest development of symmetry and flow of life; of realism and idealism; of truth and beauty; of nature and art; of qualities opposed to each other, but combining to raise the standard of the art. He would now ask the students to look at the casts on the north side of two slabs from Selinus in Sicily as illustrations of a premature desire to represent vitality to the detriment of the effect, because the artist did not possess the technical skill to realise his conception. The town of Selinus was founded in 628 B.C., and as the temple was usually the first building erected in a new city after the walls were complete, we might assume that the date of these metopes from the temple was not long after that year. The subjects were in the one Herakles bearing the Kerkopes (little demons) suspended head downwards and almost at arm's length on his shoulders, and in the other Perseus cutting off the head of the Medusa. While an artist erred on the side of symmetry, conventionality, stiffness, as in the Apollo first examined, his efforts might appear dignified, but failed to awaken full interest; where, however, they fell into the opposite extreme of vivacity, life, movement, as in these metopes, our risible faculties were kindled, and we felt the grotesqueness of the attempt. In these panels the artist wished to convey the impression that his heroes, Herakles and Perseus, were very strong, and hence he thickened the thighs and arms and so exaggerated the physical features as to make us feel that he had transgressed the limits of form. The triumph of art was only to be attained by the exercise of severe self-restraint by the artist, and then he would make the spectator feel not that his intention was to represent strong men, but that the men were strong. The panels were well filled by their figures, the composition being far more advanced than the execution. At the west end of the room they would see in No. 30, the so-called Apollo of the Strangford collection, a great stride forward, reminding them of the Æginetan school. Although labelled an Apollo, the markedly athletic form and the braided hair showed it to be the figure of an athlete. In this archaic period of sculpture, the gods, especially Apollo, were represented with long hair, and the athletes with braided hair, it not being shown as cut short till after the time of Myron. This statue was, therefore, certainly later than the 60th Olympiad, when the custom of erecting statues to athletes was introduced. It showed a great advance in anatomical knowledge in the perception and power to represent the changing form of the nude male figure, in the lines of the ribs, the abdominal muscles, and still more in the treatment of the outlines of the lower thigh and knee. But we were still reminded that it was cut by the chisel from a hard block of marble; the illusion was not so complete as to lead us to forget the laborious effort of the sculptor. The statue would have been far more effective if, instead of planting it firmly on both feet, the artist had ventured to allow one leg to carry the principal weight, and slightly raise the other foot and knee in an easy posture. To the right of this was a larger and much more artistic statue; its subject and sculptor were contested, but he believed it was also an athlete, and that it might be the copy in marble of a figure in bronze by Pythagoras of Rhegion. Like the last statue, it was armless, and near the right thigh was represented in bold relief on the background, a vertical band, which had occasioned much discussion as to whether it was a branch of a tree or pertained to the figure. He believed it to be a leathern strap used as a cestus, and pointed out the indication of a broken thumb-mark on it, corresponding to the supposed length and position of the lost right arm. From this, and the breadth and development of chest, and the erect position with arms set back, and other reasons, he held that the figure represented a successful pugilist; of the approach to beauty in and finished perfection of the statue it was easy for all to judge. He might here remark that the artists of the Æginetan school evinced much greater correctness in the anatomical representations of the male than of the female figure, and that the dress and pose of the latter were always more conventional. The reason was not far to seek; in the palestræ they had constant opportunities of observing the nude male figure which they had not with the female, and it was therefore more easy to indicate aright the outline of the former beneath the garments than the latter. In illustration of the gradual improvement in the treatment of the draperies in later work, Dr. Waldstein showed and described the sculptures on the Harpy tomb in the centre of the room, and demonstrated that the casts of metopes from the Acropolis of Athens, exhibited a still further advance in delicate definition of the relation of clothing to the human figure beneath it. Notwithstanding this development, he should show, in his next lecture, that there was a great gulf fixed between the period before Pheidias and the work of that artist in the pediment of the Parthenon. Passing into another gallery, Dr. Waldstein showed the casts of the eastern and western pediments of the Temple

of Athené, in the island Ægina, the originals of which are at the Glyptothek, Munich. The pediments had been identified from ancient descriptions, and were set up by the Æginetans to commemorate their own prowess and valour in the battle of Salamis, B.C. 480. There was reason to assume that these sculptures were by the hands of Onartas. The subjects were taken from the Homeric poem, and were incidents in the Trojan war, from whose heroes the Æginetans claimed descent. That of the western pediment* showed Minerva in the centre looking on with approval, while a warrior seeks to drag a wounded hero, probably Patroclus, off the foreground. The eastern pediment represented the contest of Herakles and Telamon against Laomedon. The execution of the latter was far better than the former, and might, indeed, be considered the most perfect sculpture prior to the days of Pheidias. In both the peculiar restrictions imposed by a triangular pedimental space were skilfully complied with; the point of action and of interest was in the centre, and receding figures in various attitudes led to the extremities where the warriors were *hors de combat*. The figures were nude, but were armed with helmets, shields, and bows, swords or spears. The treatment of these warriors showed an enormous advance on earlier work, but was not quite free from the hardness characteristic of Æginetan work. On all the faces, even on those of the dying men, was depicted a painful and ghastly smile, and this was common to an intermediate period of all archaic work. It was due partly to want of skill in representing the human face, but chiefly to a curious psychological error which marked the early phases of art in widely separated countries—viz., that in order to produce pleasant emotions in the spectator's mind, the face represented must have what the sculptor imagined to be a correspondingly pleasant expression. The same mistaken idea led to the unpleasing grin visible on the Heraklean metopes from Selinus, but was not visible in the earlier statues of Apollos and athletes. As the art of sculpture progressed it would be seen that the human faces pourtrayed grew increasingly noble. Since the pedimental sculptures were intended to form the relief to an architectural composition, and only to be seen from below and in connection with the temple front as a whole, the strict laws as to the amount of movement permissible to a permanent statue must not be applied. Still, they represented a stage in the development of representation of active movement, which passed its climax in the works of Myron, whose Discobolos† the students were shown at the close of the lecture. While the aim of sculpture should be to lead the spectator to ignore the material in which it is wrought, the limitations imposed by that material must not be transgressed, or the mind is at once recalled to the fact that it is but a daring representation. The triumph of art might be an illusion, but was never a deception. Myron overlooked this, and technically skilful as he was, he failed as an artist, because as the allusions to his cow, his dancing satyr, and this disc-thrower showed, he chose to appeal to the lowest popular taste. The marble statue before them was probably a late Roman copy of Myron's work, and differed from another and more perfect copy extant at the Massimi Palace, in that the head was turned downwards instead of towards the discus. It represented a feat of strength in which the athlete did not aim at a mark as with a quoit, but, contracting his muscles and bending over towards the discus held in his right hand, he suddenly swung round, and with a simultaneous release of many muscles hurled the stone from him. Such a violent contortion of the whole frame possessed great dramatic force; but it was but an evanescent action, and quite unsuited for sculptural representation.

LECTURE IV.

In this lecture, delivered at King's College on Tuesday afternoon, Dr. Waldstein considered the artistic side of his subject, asking What was the spirit of the period of Greek sculpture during which Pheidias lived, and why his work was esteemed by contemporaries and by those who had studied the fragments remaining to be of such great excellence? The inherent difficulties in every art were at first mechanical, but afterwards artistic, for although the artist at first encountered great obstacles in expressing himself, when he had acquired technical skill he was in peril of using that power simply for ostentation, and for producing *tours de force*. Art only attained its highest development when the artist, repressing his desire for mere display, and aiming at something higher than he had yet attained to, strove to use his talents for the representation of that expression of typical human life most suitable to his particular form of art. That there was some special type of life most appropriate to each particular phase of art was a truth which was the basis of perfection in art; a further step forward was to recognise and select what were the appropriate phase and type. The artist, having mastered his material, would not forget its natural restrictions, but would study what balance he should hold, with a known power of representation within his grasp, between a broad and general or a minute and individualising method of treatment. To each art there belonged a special and peculiarly appropriate mode of transcript for the variety of human life the artist observed, and the more exactly his mode and subject agreed, the more perfect would his work be. A landscape might be viewed by an observer through whose mind there passed many forms of thought, and each mood would dwell upon different characteristics—the geological formation, the surface outlines, the play of colour, light, and shade, and the sounds of water, breeze, and bird; each of these modes of observation from the first represented an increasingly transient quality of the landscape, and each mode had its parallel in art in some manner of representing life—the geological or most permanent being equivalent to architecture, the surface study, still lasting but more restricted, to sculpture; the diversity of tone to painting; and, most fleeting of all, the passing sounds to poetry and music. Each proceeded to a greater degree of individualisation than the last. The lecturer added that he had prepared a diagram (see below) showing how this individualising developed in the arts of Greece, and how, although they overlapped each other at every stage, had their flux and reflux with the progress and decline of individual men, yet they could be tabulated and defined in a manner which would be quite impossible under our complex modes of life and thought. Corresponding to the relative permanence of the art was the period of its highest excellence, as was indicated by the diagram, which, however, was merely a suggestive indication of lines of study; it was, indeed, but a skeleton needing to be filled up with flesh and blood to render it of much value. It followed that the phase of human life which would be most fitting for representation in sculpture was a selection from examples of its most lasting, most perfect state. The individual man was mortal and constantly changing, but the genus, the type of the human race continued much the same through all ages, and the sculptor who would produce the best work must conceive from a wide survey a typical human being, in full vigour. Such a broad conception of man floating above the common life, not subject to its mutations, yet possessing like characteristics in the highest potentiation, the Greeks possessed in their gods, and such were the ideals that Pheidias aimed to represent in sculpture. On looking on such works we no longer were reminded that they were fashioned from stone or bronze, because our minds were impressed with the perfect harmony between the conception and the execution of the work. All the highest works of Pheidias had unfortunately been destroyed, but even in the decorative adjuncts to great temples, such as the pediments and friezes of the Parthenon, the characteristics of his genius displayed themselves. In conclusion, the lecturer asked his audience to look at the man behind the artist, and then proceed to graphically sketch out the life of Pheidias, showing how the incidents and surroundings of the man reacted on the works of the sculptor. Born about 500 B.C., the son of an Athenian named Charmides, he was about ten years old when the battle of Marathon was fought, and nearly twenty years old when the naval victory of Salamis destroyed the Persian fleet, but left the Athenians with a ruined city to be fortified and rebuilt. After a tedious drudgery with the sculptor, Hegias, the young artist was placed under the teaching of the Academic Agéladas, of Argos, having as fellow pupils Polykleitos and Myron, and there his aspirations and desires for the highest work were encouraged and gratified. The age of Themistocles, so important in Athenian history, in providing fortifications and walls for the city, had not been productive of art manifestations. There were to be traced three distinct periods in Greek sculpture corresponding to the life of Pheidias. The first was contemporary with Kimon, when the works of art immediately served to commemorate Greece in illustration of her warlike character, as in the semicircle of thirteen figures with Mithrates at Delphi, the colossal Athené Promachos, &c.; this was a decorative age, in which the citizens had the embarrassed self-conscious power of *un nouveau riche*, feeling the weight of their recent political history and their great capabilities pressing upon them. The second was the period of the highest perfection, when Pheidias was appointed under Pericles chief supervisor, not only of sculpture, but also of architecture and painting. He then appeared to have been a victim to the schemes of those who wished to strike at Pericles through his friends, for he was banished from Athens on a charge, probably false, of misappropriating gold from the Parthenon, and retired to Olympia, where, during the third period, he executed the statue of Zeus and other works at the temple of that city.

PROGRESS OF INDIVIDUALISATION IN THE VARIOUS ARTS.

B.C.	Architecture.	Architecture.	Sculpture.	Painting.	Poetry.
to 460	Architecture.	Doric.	Archaic. Transition. Ægina. Pythagoras Myron Kalamis	Archaic. Plastic. Vases of Geometrical Style. Black Figured Vases (Human Figure).	Epic.
to 350	Sculpture.	Ionic.	Highest period. Pheidias. Polykleitos.	Lead over to Red Figured Vases. Polygnotos. Apollodoros.	Dramatic. Æschylos. Sophocles.
to 300	Painting.	Corinthian.	Transition. Praxiteles. Skopas. Lysippos.	Highest period. Zeuxis. Apelles.	Dramatic. Euripides. Idyllic.
	Poetry.	Eclectic-Roman.	Dramatic. Schools of Pergamos and Rhodes Græco-Roman.	Decline. Decorative Painting.	Idyllic. Theokritos, Moschos, &c. Alexandrine.

* This pediment forms Fig. 8 of a plate of illustrations of Early Greek Art published in the BUILDING NEWS for April 25, 1873.

† This statue is numbered 16 in a plate of Greek Sculpture, published in the BUILDING NEWS for July 4th, 1873.

At the last meeting of the Ilfracombe local board, it was agreed to extend the time for the completion of the new waterworks, till December 31st. The contractor is Mr. Jones.

ST. PAUL'S ECCLESIOLOGICAL SOCIETY AT BERKHAMPSTEAD.

THE members of the Ecclesiological Society visited Berkhampstead on Saturday afternoon. At the parish church of St. Peter's they were received by the rector, the Rev. J. W. Cobb, M.A., and by the Rev. Canon Owen W. Davys, M.A., of Wheathampstead. The church is a large cruciform structure with central square embattled tower, having the characteristic Hertfordshire turret; nave of seven bays with aisles and south chapel, deep transepts, that to north with groined eastern chapels, chancel with south chapel. It is built of flints with local clunch-stone dressings; the crumbling chalky nature of this stone has necessitated considerable repairs. Since 1871 the church has been undergoing restoration from the designs of Mr. W. Butterfield. The tower and whole north side of nave are covered with a plaster coating. When the members had assembled in the church Canon Davys read a paper relating to the fabric, introducing his subject by reminding the members that Berkhampstead was a place full of historical and antiquarian features. The Castle was the fortress to which William the Conqueror came after the battle of Hastings, before he could venture to approach nearer to London, and here the understandings were entered into which permitted of the Norman prince's advance to the metropolis, and his coronation at Westminster; and we need but turn from the crumbled masonry, the moats, and the gateways of a structure among the most ancient in this kingdom, to a building at that moment standing perfect — Berkhampstead grammar-school—raised by a dean of St. Paul's on the decaying foundation of an old religious house; to view the first and last chapter in the important mediæval history of the town. Having referred in terms of high commendation to the rector's published "History of Berkhampstead," Canon Davys said the church in which they had met was one of considerable architectural character, but it had suffered many things at the hands of many restorers. Repairs and reconstructions, dating from a very early period, had taken place, and the building was a noteworthy instance of enlargements so carried out by Mediæval architects as to add to its dignity without injury to its character. He need only say that Sir Jeffry Wyatville was employed upon the church to indicate a period of great suffering from attempted restoration. However, with the exception of the thoroughly Wyatt-like vaulting under the tower and some plastering without, not much of his mischief remained to be seen. A great restoration of this church, on what were supposed to be more enlightened principles, took place about ten years ago, under an eminent living architect, whose work, however, had not been deemed entirely satisfactory by his critics. He could but add his lamentations to the sorrow of those who had grieved over the partial destruction of the beautiful screenwork of St. John's chapel, on the south side of nave. The probable apology for the screen's removal would be the inconvenience it occasioned by separating the members of the school who now worshipped in the chapel from the body of the congregation, but happily a new use for such adjuncts as side-chapels in large churches, as at St. Paul's Cathedral, had now been found. He must now ask the members to follow with the eye while he endeavoured to trace the architectural history of this church as far as, after considerable obliteration, it could now be deciphered. In the western wall of the north transept externally was a rough arch, which probably belonged to an earlier church: it was formed of Roman bricks, quarried from some older building (possibly Verulam), with small pieces of clunch stone inserted. About the year 1220 a new church was begun on the old site, and this, Mr. J. H. Parker had stated before the Archæological Institute, was a Greek cross with low tower and short spire at the intersection. They had no visible means of determining the length of that nave, but the piers and arches of the tower of that date were before them, and were admirable examples of the earliest period of Early English work. Some of the original lancet windows were also still to be seen in the chancel, and by going into St. Catherine's Chapel on south of chancel, they would see what he regarded as the corbel table, under the original oversailing roof, still *in situ*. The whole of the chapel referred to was a puzzle. It appeared to have been built out during the great works accomplished during the later portion of the Early English period, as a large south chancel aisle, an arch having been cut into it through the original earlier wall. The windows were then adapted for Geometrical tracery, but when the chapel was further glorified, and an elaborate sepulchral recess inserted (now, curiously enough, associated with the name of Friar Bacon) tracery of Late Decorated character was placed in the windows. The original transepts probably had eastern chapels, but that to the south was afterwards removed on the erection of the larger chapel just described. Till recently the rood-screen occupied its original position across the chancel-arch, but had now been placed between St. Catherine's Chapel and the chancel, and close to its present position could be seen the stairs to rood-loft and tower. The vaulting and eastern chapel of the north transept was of the Geometrical Early English period, with rich Decorated windows inserted. These windows were now being removed for the insertion of new tracery, based, it was true, on the old lines, but still a modern work. He believed it was generally possible to cut away the decayed external faces of such windows and carefully piece on new stone, leaving sufficient of the old work to indicate the authority for the restoration. This had been successfully done in the Lady-chapel, St. Alban's, and at Wheathampstead. The great addition to the church of 1220 was the splendid new nave which they now saw. On its south side was the chapel of St. John, originally provided for the Brotherhood, and now used by the grammar scholars, who had succeeded to that foundation. This chapel was separated from the nave by a stone pier and by a singularly beautiful timber pillar, both carrying oak struts which supported the roof. In the north aisle of nave was a window, with very singular tracery, which appeared to be one of the many insertions of the Geometrical period. The great west window, the whole addition of clerestory and many windows, belonged to the Perpendicular period, while the upper part of the tower was an addition of Late Tudor period, known by the rental book of the grammar school to have been built in 1535. The monuments were both numerous and interesting, but it was to be regretted that so many of them had been moved from their original places, and that brasses of intense value, such as that to Sir John Raven, the Black Prince's esquire, had been reset in modern paving stones. The grand Torrington altar-tomb was well known; that of John Sayer, chief cook to Charles II., had much interest, while more tender sentiments were awakened by the sight of the mural tablet to Ann Cowper, the poet's mother; to his father, the rector, no monument appeared in the church.

Canon Davys then conducted the members through and round the church. Some discussion took place as to the variety of the pillars in the nave arcades, three of these, and the eastern responds, being clustered, of four semi-circular shafts attached to a round pier, while the others were simply cylindrical columns; all the caps and arch mouldings were uniform, and the clerk of works called attention to this and the difference of tooling as proofs that the clustered columns were comparatively modern insertions, whereas Canon Davys and one or two architects in the party considered them of late 14th century character. Several of the columns lean considerably outwards. The eastern wall of nave is decorated with a "Majesty" executed by Mr. Daniel Bell in 1874. In the north transept were seen fragments of a font decorated with interlacing ornament of Transitional Norman period. At east and south ends of St. Catherine's Chapel, the clerk of works showed traces of splayed window now walled up to a crypt, which, when examined during restoration, was found to have been used as a charnel-house. Some discussion took place between the clerk of works and Canon Davys as to the replacement with new work of one of the east windows to north transept, the tracery removed from which was set out on the grass, but appeared fairly capable, Mr. Davys thought, of repair; the clerk of works mentioned that Mr. Butterfield spent four hours in the churchyard in studying the window, to which the Canon replied that the new one might be an accurate re-production, but at the best was but a copy.

The *Grammar School*, which faces the north front of the church, was next visited, under the guidance of the head master, the Rev. E. Bartham, who stated that the central part, the schoolroom itself, was built on the foundations of the Brotherhood of St. John, by Dean Incent, in 1541-2; the domestic buildings at the west and the boarding-house on the east were modern additions. The schoolroom is of red brick with good stone hood-moulds to doors, and transoms and mullions to the six two-light windows on either side; the roof of seven bays is modern, but is carried by original oak corbels boldly carved and grotesque in design.

St. Mary's Church, Northchurch, was next visited. It is a small cruciform aisleless structure, chiefly Early Decorated in character, with a west window of Flamboyant character. It is at present unrestored; the whole exterior to the top of embattled central tower is covered with plaster, now peeling off; the painted deal pews and west gallery of half a century since encumber the nave, and the east end of chancel has been shut off for use as a vestry by a lath-and-plaster partition in which is a Chinese-like replica of the Perpendicular east window. The rector stated that all this is about to be altered; plans existed for the restoration of the church, including repewing and the addition of a south nave aisle and vestries to chancel, which will be opened to its full length; the cost is estimated at £2,500, and the number of sittings will be increased from 340 to 400. In the south transept is an elaborately-carved oak chest of the Early Perpendicular period.

In the evening some examples of timber-framed houses and stamped plastering in the town, and the ruins of *Berkhampstead Castle*, on the north of station, were inspected before returning to town. The plan of the castle can easily be traced, the oblong inner bailey, with artificial mound, still perfect at N.W. angle, and inclosed by vallum, ramparts, and outer moat, are all distinguishable; but the masonry is reduced to irregular masses of rubble-work.

COMPETITIONS.

LOWER NORWOOD.—The committee have received fourteen designs for the new Baptist Chapel in the Gipsy-road, and have accepted the one bearing the motto "Studied," the author of which is Mr. Hampden W. Pratt, of 3, Long-acre, W.C. The chapel is to seat about 750, and there will be in addition the usual vestries and a large school with class-rooms, &c.

STRATFORD-ON-AVON CEMETERY.—In this competition twenty-nine plans were received by the town council of Stratford. Three plans were selected, but not one of these it was found met the full requirements of the committee of the town council, who, according to the *Stratford-on-Avon Chronicle*, "found themselves placed in a very unpleasant dilemma. They had either to commence anew their labours, or perform the very delicate task of deciding between the plans of the local gentlemen—*both officials of the council*. It was determined to adopt the latter alternative, and after minutely comparing the plans of Mr. Lattimer and Mr. Allen, it was agreed by a large majority to recommend the council to adopt the plans of the latter." After a long discussion the council adopted the report, and the work is to be carried out at once.

WALSALL.—A special meeting of the Walsall School Board was held on Tuesday night, to consider and make a selection from thirty-five sets of plans for the proposed new schools at Elmore-green, Bloxwich. After a long discussion it was unanimously agreed to accept the plans of Mr. S. Loxton, subject to certain alterations being made, the arrangement of which was left to the Building Committee.

A new block of buildings, including a New-Church (Swedenborgian) institute, a public hall, and Freemasons' hall, is about to be built near the Green, Penryn, Cornwall. Mr. Rickard, of that town, is the builder.

The new premises of the London and Lancashire Life Assurance Company, in Cornhill, E.C., are now almost completed. The block of buildings is 65ft. 6in. in height, and has a frontage to Cornhill of 55ft. Mr. T. Chatfeild Clarke is the architect, and Messrs. Colls and Sons, of Moorgate-street and Camberwell, are the contractors; the cost is about £16,000.

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ILLUSTRATIONS.

EXTERIOR AND INTERIOR OF THE PARISH-CHURCH OF ST. ANDREW, STOKE DAMEREL, DEVONPORT.—THE VICARAGE, BEDFORD-PARK.—UNIVERSITY COLLEGE, LONDON.—PRINCE ARTHUR'S APARTMENTS, LUDLOW CASTLE.

OUR LITHOGRAPHIC ILLUSTRATIONS.

ST. ANDREW'S CHURCH, STOKE DAMEREL, DEVONPORT.

THIS church, which we illustrate to-day, is designed in the style of the 13th century, and arranged to accommodate 1,200 worshippers. The building consists of chancel, 44ft. by 26ft., with aisles 20ft. by 14ft., nave, 132ft. by 30ft., aisle, 104ft. by 12ft., and transepts, 25ft. by 26ft. The tower is 27ft. square and 106ft. high to the top of the battlements. Vestries and meeting-rooms are arranged under the east end of the church, and these, in consequence of the fall of the ground, will be well lighted. The approach from the vestries to the church will be by flights of wide steps, on either side of the choir, and these stairs will also be used by the congregation. The estimated cost is about £20,000. Mr. J. P. St. Aubyn is the architect.

THE VICARAGE, BEDFORD-PARK, CHISWICK.

THIS house is now being built adjoining the church on the Bedford-park Estate. Our illustration is taken from a drawing in the present exhibition at the Royal Academy. Mr. E. J. May is the architect.

UNIVERSITY COLLEGE, LONDON.

ON Sept. 10th, 1880, we published a view of the Slade Fine Art Schools, erected as a new wing to University College, Gower-street, from the designs of Messrs. Perry and Reed, the architects to the college, in conjunction with Prof. Lewis. To-day we illustrate a design prepared by Messrs. Perry and Reed, showing how the college buildings may be completed and enlarged. If carried out the effect would be to give a third floor over the whole of the main structure, which is at present only two stories in height. It would also allow of making the present upper story of the school square, and of giving it the direct north light which is so much required for drawing-classes. The return ends to the wings would also afford large additional accommodation for college purposes, whilst the completion of the stone screen from wing to wing would form the quadrangle, as suggested by the architect's original sketches. The small interior view shows the fitting up of the new chemical laboratory. These fittings comprise working desks sufficient for fifty students, those at one end being fitted up for beginners, and those at the other end for more advanced students, all of them exceedingly spacious and commodious. In the middle of the laboratory are various appliances for general use, such as (1) a table fitted up for treating substances with sulphuretted hydrogen. Each bottle through which the gas is being passed is surrounded by a glass cylinder, through which there is a powerful down-draught passing. The substance under treatment is conveniently accessible, yet none of the sulphuretted hydrogen can escape into the air of the laboratory. (2) Water baths heated by steam from a boiler outside. Each evaporating dish is heated by itself in a current of pure and warm air, whilst all the fumes which pass off from it are drawn directly into a flue, without any probability of contaminating the contents of other dishes. (3) Water, air-pump and Sprengel-pump. (4) General reagents and apparatus. (5) Reservoir of distilled water and tank of hot water. Opening into the chief laboratory is a room of similar construction, but of smaller dimensions—viz., 40ft. by 20ft. This "furnace room" contains arrangements for evaporation and distillation, and for fusions, &c., requiring very high temperature. The work was done under the immediate superintendence of Professor Williamson, F.R.S., the engineering appliances being executed by Messrs. Rosser and Russell, and the builder-work by Mr. W. Brass. We also give a plan of this portion of the new buildings.

PRINCE ARTHUR'S APARTMENTS, LUDLOW CASTLE.

For description, see page 700.

IMPROVEMENTS IN STOVES.

THERE has been considerable activity shown of late among stove manufacturers and patentees in the production of new and improved heating and smoke-consuming arrangements. Many of these can scarcely be called either novel or scientific, as they are merely modifications of existing types of grates, the chief aim being a grate that shall present some new feature. One of the most recent and ingenious arrangements we have had brought to our notice, indicating a decided departure from existing models, is the newly patented "Westmacott Stove," various forms of which can be made to suit all domestic cooking or sanitary purposes. The "Apartment" stove seen in action at the office of Mr. Perceval, 11, Bridge-street, Westminster, presents the appearance of the ordinary open fire, and is capable of burning any kind of fuel or gas. Its construction differs from that of the common stove, inasmuch as the fire-grate is surrounded at the back and sides by an iron hollow air-chamber or boiler. This iron chamber, in fact, represents in front the hobs of the old-fashioned grate, and it extends round the fire to a certain height above it. The grate is movable in the space so formed, and has bars not only in front but at the sides and back as well, leaving ½in. air space between it and the back and sides of the air chamber. At the bottom of grate there is a movable set of bars below the fixed bars which can be made to slide in or out, so as to regulate the apertures, and consequently, the combustion may be made either quick or slow. Over the fire-grate, and covering the air-chamber is a plate of iron, and the smoke escapes through two apertures at the sides, and passes up two curvilinear-shaped flues, which incloses in the centre immediately over the fire a semicircular space, having doors in front, and answering the purpose of an oven or boiler. A blower is used for the purpose of lighting the fire or increasing the draught. If it is intended to cook, the plate immediately over the fire is made to fall back as a hinged flap; it has also openings in it for kettles or sauce pans. Such are the main features of this ingenious stove, which, in the form we have described, appears the very *multum in parvo* of an economical heating and cooking apparatus, and well suited for industrial dwellings, cottages, and small tenements. With the brightness of an open fire, the stove combines a large boiler always in readiness, with an oven and roaster, while the smoke is largely consumed, and the hot-air chamber can be made available for heating rooms above. One undoubted point in this stove is that the heating chamber or boiler cannot possibly crack or burst, as the air space between the grate bars and the chamber prevents such an accident occurring, as well as facilitating the consumption of the smoke. Another and simpler application of the same principle is shown by the inventor in which the flues, instead of being curved on each side of oven, are arranged in a single small opening directly above the fire, on each side of which are square spaces, which can be used as ovens or for boiling, or in cases where cooking is not required as hot-air chambers for supplying warm air to other rooms. The patentee, by a combination, has succeeded in making such an arrangement useful for warming two rooms, or for general heating and sanitary purposes, and various combinations can be made by having a direct external supply of fresh air purified through wool or otherwise, and made to enter the hot-air chambers or inclosed spaces above the flue, and thence taken by pipes to an upper chamber, from which various rooms may be heated by flues, valves being placed to regulate the supply of warm air. Of course the air-chambers are best constructed of fire-clay, and the patentee proposes to construct most of these stoves of terra-cotta. Another modification by the inventor is a stove having four open grates, with contracted flues admirably suited for churches, chapels, halls, &c., and which can be placed anywhere, the hot-air spaces being utilised to heat upper rooms or allowed to escape, as in the single stove, at the top under the mantel. The anthracite coal we saw burned gave a brilliant fire with a minimum of smoke, and the heat thrown into the room was considerable.

We have also examined a newly-patented "Ventilating, Heating, and Smoke-Consuming Stove," invented by Mr. Robt. H. Griffin, of Lonsdale Chambers, Chancery-lane, which seems to provide, in a more perfect manner than many stoves constructed with air-chambers, for the circulation of a larger volume of fresh warmed air. Mr. Griffin's grate combines the close-air stove with the open register stove, and differs chiefly from other forms of ventilating grates by the addition of a separate air-chamber for super-heating the vitiated air as it passes from the room, and assisting the combustion of the fuel and smoke. The principal air-chamber formed behind the grate is covered with an iron plate, and the back of grate and recess is lined with fire-clay, so that the air is not injured by contact with iron. The fresh air is introduced at the side or back into this chamber, and after becoming warmed, passes into the room through an open grating or ventilating panel over the front of grate. As warm air it rises to the ceiling, travels to the end of room, and returns beneath the fire, passing into the chamber at the back of grate already mentioned, where it becomes super-heated, and is delivered in jets into, around, and over the fire, after which it passes up the chimney. We have seen the operation of this grate fitted at the end of a long room, and believe the enlarged air-chamber and heating surface formed by the iron plate above the chamber and the separate super-heating arrangement will be productive of economy of fuel, a diminution of smoke, and a more uniform temperature in the room. The fire is bright and cheerful, and the super-heated air jets, round and over the fire, add to the more perfect combustion of the fuel. The stove can be used in hospital wards, and the air supplied to the inlet may be fumigated with medicated vapours or disinfectants.

CHIPS.

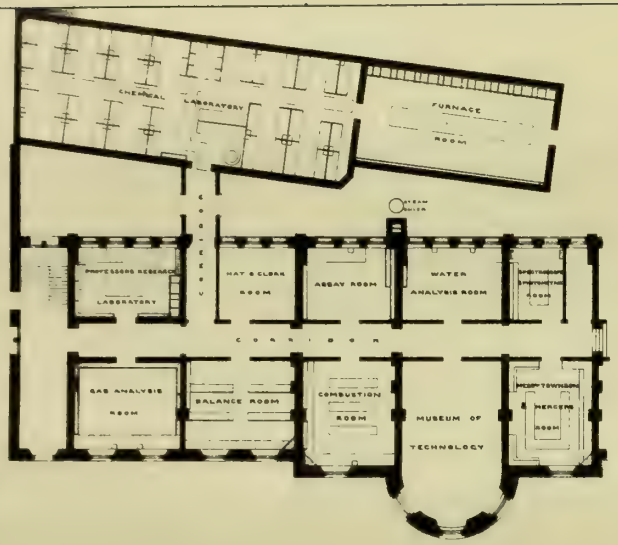
The foundation-stone of a Wesleyan chapel and school was laid on Whit-Monday, at Barnby, near Beccles. The building, which is to accommodate 200 persons in the chapel, and 60 children in the school, is to be built of red and white brick, with moulded white brick jambs, and heads to windows and doors, with slated roofs. The internal fittings to be of red wood, sized and varnished. The contractors are Messrs. Dunn and Cutler, of Beccles, under the direction of Mr. Edgar Goff, architect, of Lowestoft.

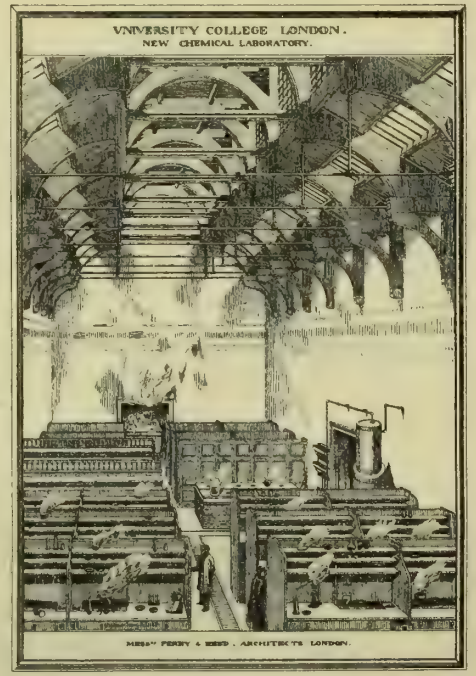
The prospectus will be found elsewhere of a company being formed to manufacture the new paint-brush, invented by Mr. Edward Wright, and noticed by us a few weeks since. There is no doubt about the utility of the article, and there should be little more about the success of the company, which is going to work something a little more substantial than the auriferous reefs in Timbuctoo and elsewhere, of which the glittering descriptions are daily filling our letter-boxes and newspapers.

The north-west pinnacle of Crediton church tower was struck by lightning on Wednesday week and shattered, the pieces going through roof of church and injuring the pews.

The foundation-stone of the new church of St. Matthew, Newtown, Exeter, was laid by the Mayor of that city on Thursday, the 9th inst. Mr. R. Medley Fulford, of Exeter, is the architect, and Messrs. E. L. Luscombe and Son the builders. We illustrated and described the church at page 232 of the present volume.

UNIVERSITY COLLEGE, LONDON,





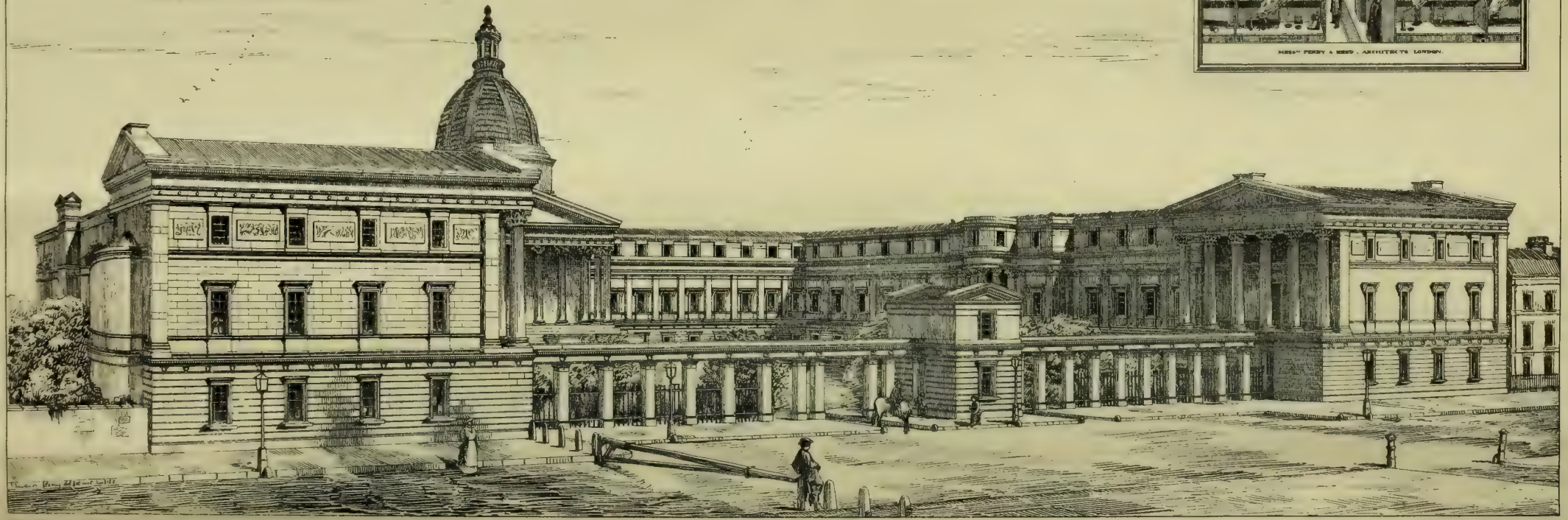
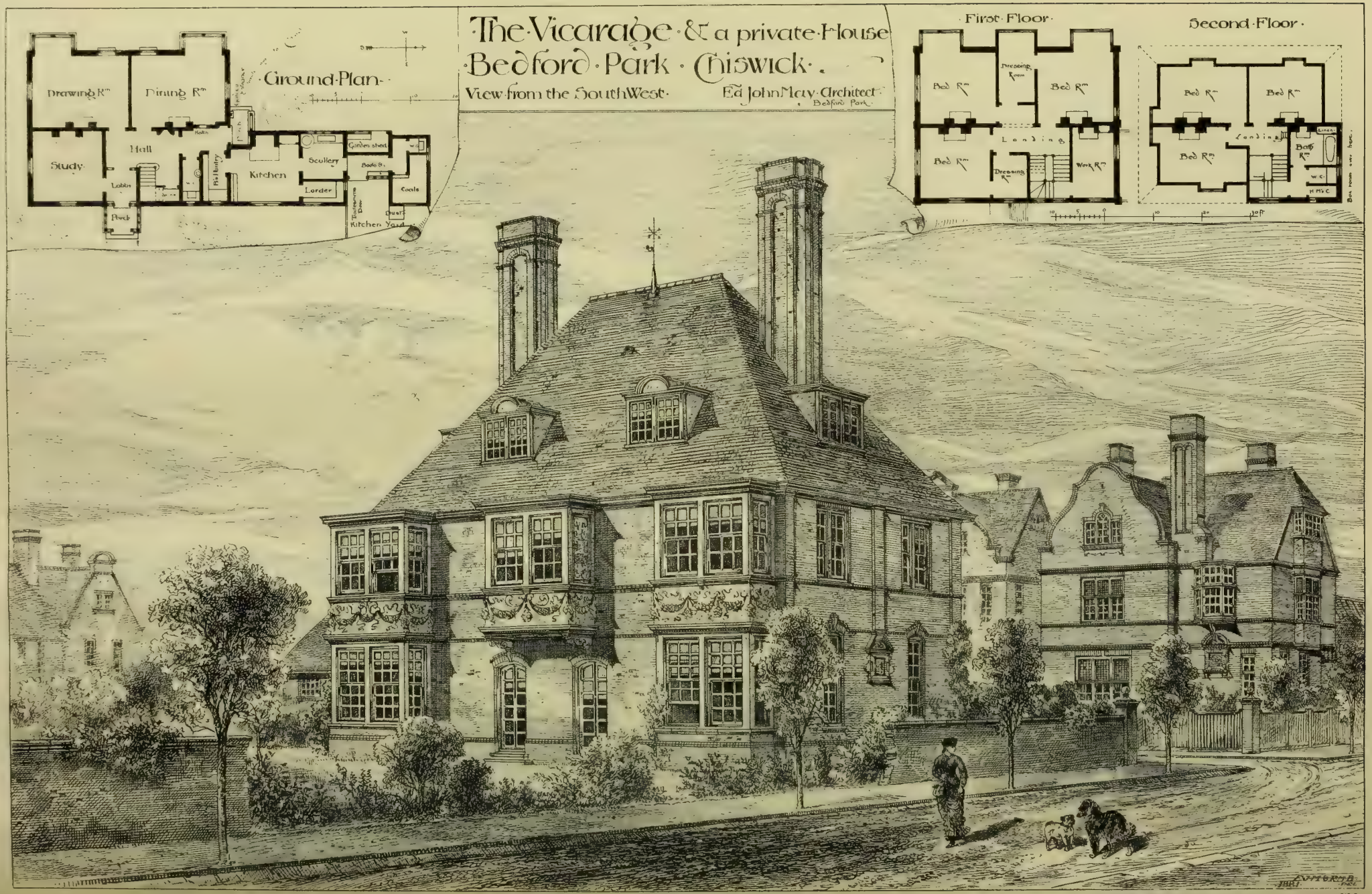


Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W C

Messrs. PERRY & REED,
Architects

The Vicarage & a private House Bedford Park Chiswick.

View from the South West. Ed John May Architect Bedford Park.



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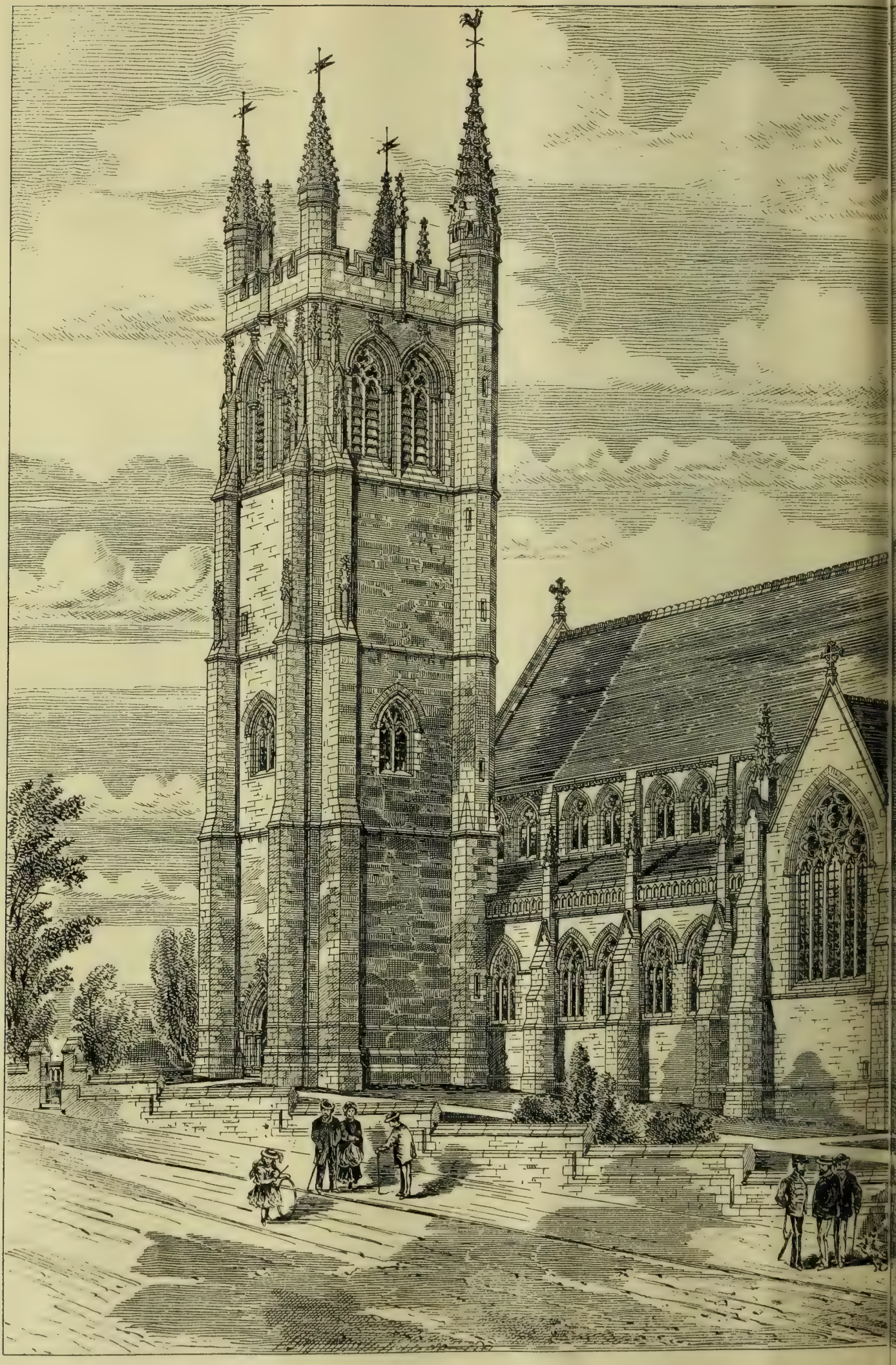
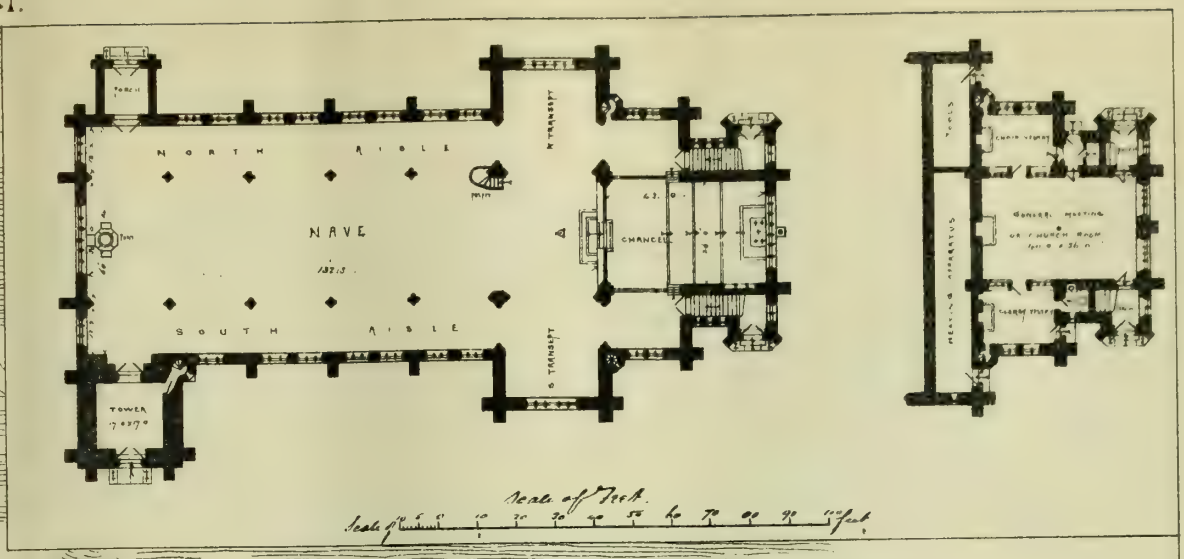
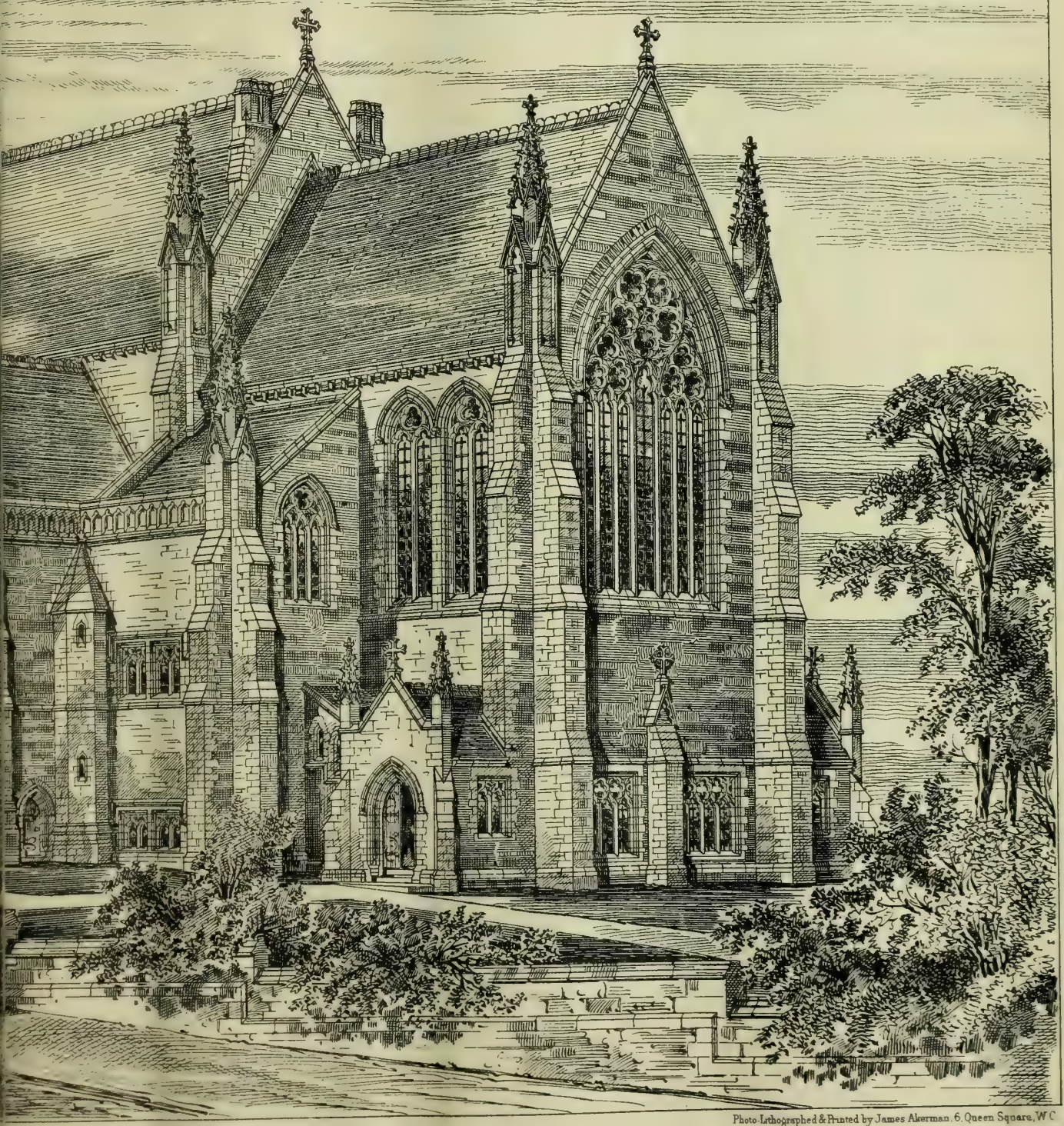


PARISH CHURCH OF S. ANDREW.

J. P. St A





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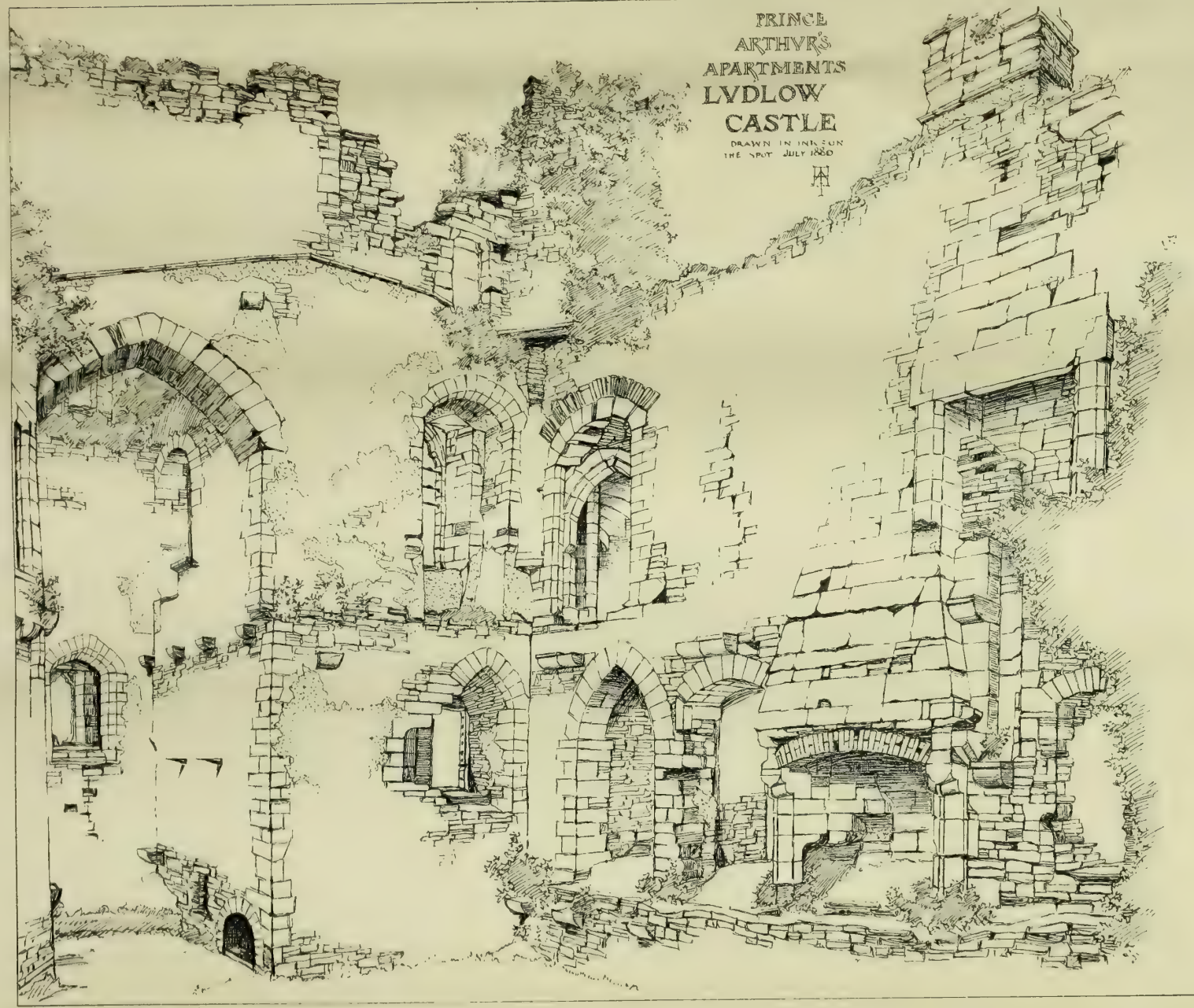
TOKE DAMEREL, DEVONPORT

ARCHITECT

J. Akerman, Photo-lith London

PARISH CHURCH OF S. ANDREW, STOKE DAMEREL, DEVONPORT

J. P. ST. AUBYN, ARCHITECT



A DRAWBRIDGE
B KEEP
C SIDNEY WING
D BAKERY
E WATCH TOWER
F KITCHEN
G CHAPEL
H PRINCE ARTHVRS APARTMENTS
O COMVS CHAMBER
P STATE ROOMS
Q WATCH TOWER
RR TWO PRINCES ROOMS
S SVPPOSED TREASVRY
T WELL

LVDLOW CASTLE
BLOCK PLAN

THE CASTLE

HEK • LITH • THE •
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DOMNI • 1586 •

PRINCE ARTHVR'S
APARTMENTS
LVDLOW
CASTLE

PLAN AT EIGHT LEVEL ON INTERIOR
DRAWING

Two Corbels

Theodore Howard del.

Photo Lithographed & Printed by James Akerman, 6, Queen Square W C

DECORATION AS APPLIED TO ARCHITECTURE FROM A PAINTER'S POINT OF VIEW.*

I HAVE been asked to write a paper on a subject about which so much has been written, and well written, that it is almost impossible to say anything new about it; but perhaps, when looking at the subject from my own (a painter's) point of view, I may be able to say something which may be of interest to you as architects. It is out of my power to speak of any of the earlier work, but in Rome itself and the surrounding neighbourhood we can examine the later work at its perfection, and the commencement of its decline better than anywhere else. In the Vatican, too, we have the advantage of being able to study entire rooms left almost, if not quite, as they originally were.

I will divide what I have to say under the heads of Arrangement, Scale, Colour, Construction, Relief, and Material.

ARRANGEMENT.

To commence, then, with the Vatican. In the roof of the Sistine Chapel the main subjects of the flat of ceiling are placed lengthwise across the ceiling, so that to look at each and all of them it is necessary to face the altar; but these subjects are surrounded by the single figures of the Prophets and Sibyls, and groups in the cone, so placed that whichever way you may be looking at the ceiling you must see one or more of them the right way up. Even with this marvellous work before me I cannot help wishing that it was on the walls instead of on the ceiling. It seems to me that anything requiring very much study from spectators is out of place on a ceiling, and that important figure subjects, if introduced at all, should be so arranged that they can be easily seen and taken in at one view, while the main subjects should be on the perpendicular surfaces of the walls, where they can be seen and studied without difficulty. In this case more particularly do we wish to study carefully every square foot of the painted surface, for this wonderful work is, or should be, one may say, a standard of excellence in design and style for painters of all time.

The ceilings in the stanze of Raphael vary much in excellence; and the later ones, in the designs of which he can, I fancy, have taken but a small share, if any, show very plainly that the decadence had commenced. In the *camera della segnatura* the ceiling is beautifully arranged, so that the centre compartment can be seen whatever the position of the spectator underneath, and also one or other of the four compartments containing the large well-known figures representing Theology, Philosophy, Poetry, and Jurisprudence.

This ceiling is much better divided and arranged than that of the next room—the Heliodorus—which is not so well balanced. Having taken a circle, divided into four, as the main division of the ceiling—the room not being quite square—the extra spaces at the shorter sides of the room have to be in some way filled up, and in this case these spaces have been made unnecessarily wide. It seems as if this had been done in order to get more space for the small figure subjects in grisaille; whereas by another and simpler arrangement there would be a much smaller space left, which in the former room is done, and is filled up with a running ornament. This seems to me much better in effect than the cutting up into so many small spaces for the grisailles.

A very good instance of the inconvenience of a large picture on a ceiling is to be seen in the last room, the Sala Constantino, where the centre compartment of the ceiling is occupied by a large picture which can only be seen from one place. This is also the case with the much over-praised *Aurora* of Guido, in the Rospigliosi Palace, and countless other ceilings in Rome of the late period. The top of the ceiling of the Sala Constantino is more depressed in section than that of the Sistine Chapel, which is, I believe, a flat semi-ellipse. A large picture in the centre of such a ceiling, with no reason for the spectator being in one place more than in another, is surely wrong. Whilst in the case of the ellipse, though almost equivalent to a flat surface at the top, it would be rather more allowable, and Michael Angelo has made the most of the perpendicular portion, by carrying up the figures at the sides right into the curved part, and not improbably for this reason. Here, also, the spectator is always supposed to be facing the altar, and is not intended to see the ceiling unless so doing. It seems to me, then, that the pictorial treatment of a flat ceiling is not advisable.

In this respect the French painters of the present day are entirely wrong. They go in very much for the pictorial decoration of ceilings in a florid manner, continuing the Italian traditions of the late period, apparently basing their work upon that of the Cavaliere d'Arpino, about the middle of the seventeenth century, and others of that time.

One of the subjects of design always given to a French student of painting at the Villa Medici, which he has to send home in the year, is the decoration of a ceiling. It has never obtained much here, and instances are comparatively rare of ceilings treated in this manner.

The secret of the fitness of a certain treatment for a certain place in a building lies very much in this—that the higher the constructive value is of the space to be decorated, the more severe and conventional should that decoration be—if decorated at all. The decoration is intended for those parts not so structurally important. Where the ceiling is quite plain and unpanelled, the decoration should be very evenly distributed; where the ceiling is panelled, or otherwise divided, those spaces, such as the panels, can be decorated more pictorially than the more constructive parts, such as the mouldings, or the borders inclosing the panels. There are numerous examples of this in the work of the best time. Pinturicchio's ceiling in the choir of Santa Maria del Popolo (which has been published by the Arundel Society) illustrates this very plainly, as do the stanze of Raphael. A similar principle is well illustrated by the "grottesche," or modelled reliefs in gesso. At the Villa Madama there are some lovely examples of this mode of decoration. It seems to me that it might be made much more use of in England than it is at present. I do not think it need necessarily be expensive; a great deal of the best at the Villa Madama seems to have been executed by pressing a mould on to the wet plaster, and slightly modelling on it, if necessary, afterwards. There can be no reason why it should not be used with a more severe style of architecture, if treated with more reticence than it is here. And I fail to see why, when good designs have been made by good artists, that they should not be repeated again and again. Formerly, if a design were really good, people saw no reason why it should not be used again under different circumstances. Now, it is usually the bad examples which are reproduced *ad nauseam*. Nowadays there would be an outcry if a well-known artist were to design stuccoes for a house, say, in Park-lane, and make use of some of them again in decorating a house in Prince's-gate. These stuccoes were made much use of by Giovanni da Udine and others of that time. When on a wall panel there is no reason why they should not have considerable relief, or on a spandrel or place not so constructively important as, say, in an architrave or panels of a pilaster.

The same principle seems to run through the whole—that the more essentially constructive a part of a building is, either in reality or even in appearance, the more severely and conventionally it should be treated as regards its decoration. This can be seen very well in Raphael's Loggie in the Vatican, though in some respects he has gone contrary to the law, by decorating the side pilasters with flowing and undulating arabesques, which take all firmness and stability away from them and at once cause them to lose their constructive value, in this case a real one. In earlier work a pilaster is never treated in this way, either in painting or sculpture; it usually has a line running perpendicularly down it through the ornament, which gives the requisite suggestion of strength, and the ornament is always more severe and has less relief than in other places. There are good examples of this in Santa Maria del Popolo. Surrounding the windows in a chapel painted by Pinturicchio the ornament is low in relief (in marble), and flowing round the curved top of the window and at the bottom, whilst at the sides it is perpendicular in its motif, and has a stem, as it were, running down all through it, which gives it stability. I noticed in one of the flat pavement tombs, of which there are some good examples here, that a border was treated in this way, having a very unpleasant effect on the horizontal surface, and particularly when I happened to see the tomb upside down. Surely when this is to be seen from any point, and is itself horizontal, it should be treated with running ornament, or ornament like what might be found on a moulding, and not with that which is expressive of a perpendicular motif. On the other hand, there can be no objection to such a treatment in the frontispiece of a book, as we see in so many of Holbein and his school, for in this case it is to be seen only from one point of view, and there can be no objection to an upright treatment.

SCALE.

The effect of all the stanze is much marred by hideous yellow figures and caryatides on the dado, which throw the pictures out of scale by their enormous size. On the other hand, I do not object (that is to say as regards scale) to the medallions on the dado or the smaller figures on the ceiling: they do not seem to interfere with the rest. Many architects would say that such combination is absolutely wrong, and that all the figures, both on the ceiling and the walls, should be to exactly the same scale. This I entirely disagree with, as it limits so very much the use of figure-subjects. What seems necessary is that all figures of the same rank, occupying, that is, equally important places on the walls or ceiling, should be to one scale, while those of another rank may be to another scale; according to their importance in the scheme, so should be the scale of the figures, and those very far from the eye should not be to too small a scale, so that everything may be seen clearly.

The scale of the figures in the "School of Athens" and the "Disputa" appears to be a little less than life. As regards scale, I think that as a rule, even in good Renaissance work, they are far too apt to put elaborate small work in places where it is quite lost, and is often injurious to the general effect. This seems to be particularly the case with the stucco-work before mentioned. At the Villa Madama there is much beautiful work placed very high up on the domed ceilings, especially some very exquisitely proportioned and modelled female figures, and some extremely beautiful arabesque borders, which have no business there; they should be where they can be seen. This is also the case very much at the old palace called "Papa Giulio," about half a mile out of Rome, beyond the Porta del Popolo, which has some extremely fine stucco-work—very fine in design, especially a frieze in one of the principal rooms, in which *amorini* are combined with foliage, forming a most lovely decoration. This question of scale is rather a vexed one, and artists differ very much about it.

If we are to carry out the principle first mentioned of making all the figures to one scale, we might have to go even farther, and make every object introduced in the decoration round to fit scale with the figures, which surely would tie the artist down most unnecessarily.

In the case, for example, of an altar-piece in several compartments—very often three—the three would be to the same scale, while there would very likely be smaller pictures to a different scale below in the predella, illustrating different episodes probably in the life of the saint. Were the artist restricted to one scale he would be debarred from this; and, if he had smaller compartments at all, would be obliged to fill them with ornament only. It was suggested to me as a likely reason for putting small work so high, a desire to increase the apparent size of the vault, and it looks as if it might be so. On the whole, the Villa Madama is superior to Raphael's Loggie; it is not quite so overloaded with ornament, and the stuccoes are extremely beautiful both in design and execution.

COLOUR.

Even distribution, and the most perfect balance of colour, is what Raphael has carried to perfection in the "Disputa." The gilt parts are few, only up at the top of the picture, where they combine with the richness of the gold ground on which the greater part of the ceiling is painted. Even the Host on the altar, and the rays from the dove above it, are painted, not gilt, also the ornament on the altar-cloth. Were

* A paper by R. CORBETT, read before the Architectural Association on June 10, 1881.

these gilt they would glitter and destroy the breadth of effect; also, the parts which Raphael has gilt are at the top of the picture, where they get no direct light, and, in consequence, do not glitter, but only look rich, and gradually lead up to the still greater richness of the ceiling. In the ceiling the gilt ground of the pictures (not of the framework in which they are set) is lined over with a rich brown, giving the effect of mosaic; it prevents the larger masses of gold from predominating, and has a very pleasing effect. In the smaller subjects the mosaic divisions are reduced in scale to suit the size of the figures. Even in ornament I doubt the expediency of using gold in places very well lighted, as in its application it is often difficult to determine when and where to stop. If a fresco is surrounded by much rich work, it seems necessary that it should have perhaps in itself much gilding, but it is very likely to lose rather than to gain by such surroundings, and in order to stand against rich marbles, gold, mosaic, and the like, if it would not be thrown quite into the shade, it must avail itself of such a resource as gilding. I often feel that, even in the good old work, the gilt parts of a fresco tell as spots and injure the breadth of effect, even when very evenly distributed. This can be seen in the frescoes in the Sistine Chapel below those of Michael Angelo, by Luca Signorelli, Botticelli, and others, though in this instance the gold is used only in thin lines and patterns on the dresses. Nothing harmonises really well with mosaic except a wealth of rich marbles of varied colour; and as we in England can seldom get these in any quantity, I fear it is an argument against the very general use of mosaic—at any rate, that with much gold in it—though, on the other hand, it has great advantages for our climate, as, besides being so permanent, it looks well in a low light.

As regards the general effect of a painted wall decoration, it should not be too dark, because it has no gold frame like an easel picture to isolate it, and for a similar reason white should never be too high in key. The latter would also give an unsubstantial look, as it suggests a hole in the wall with light seen beyond. For these reasons a middle tone is the most suitable, but it would be better to be too light than too dark of the two. In the Convent of St. Mark, at Florence, Fra Angelico has represented many monks in black dresses, but he never paints them black or anything really approaching it, not because he had not the means or was unable to do it, but evidently because he felt it was unsuitable.

White is often used by Pinturicchio in ceilings with particularly happy results. It is always very low in tone, but even then it is the most prominent of the colours in effect, and is always used when he wishes to emphasise a moulding or line round a medallion, to isolate it from the ground on which it is placed. I must repeat again what I said about the use of gold; if used in shadow it always looks well and rich, and helps other colours, especially blue and red, very much. Pinturicchio uses it with great success in bands of ornament in deep shadow on the ceiling mentioned before, but he never seems to use it in any quantity when in light.

(*To be concluded.*)

PREVENTION OF SMOKE.

AT a meeting of the Society of Engineers, held on Monday evening, June 13th, a paper was read by Mr. A. C. Engert on the "Prevention of Smoke."

The author, in choosing the title of the "Prevention of Smoke," instead of the "Consumption of Smoke," gives it as his opinion that smoke, once produced by the atmosphere and while being carried by the air, cannot be consumed, as every particle is surrounded by a thin film of carbonic acid. When, however, smoke is condensed as soot, heat will liberate the carbon from the acid, and then the former will burn rapidly. If this theory is found to be correct, carbon cannot destroy the germs of disease floating in the air.

For the consumption of smoke, many ingenious and elaborate inventions are on record, but not yet adopted on account of expense and complexity of mechanisms. A simpler apparatus is, therefore, required.

To prevent smoke, the cold air must not be allowed to come in contact with the gases arising from green coals, and, for this purpose, the furnace is, so to speak, divided into two parts. The fire-door is removed from the boiler, and a box fixed on in front. On each side of this box, rails are placed inside, on which a plate or shutter may rest, which can be pushed forward or backward as required. When pushed forward it passes within the boiler and drops over the firebars some 18in., thereby cutting off the draught, and preventing the condensation of the gases arising when fresh coals are put on, thus preventing smoke and the cooling of the boiler.

A still more simple apparatus can be made with the same results, if the opening or flue will admit a higher box. The shutters can be cast together in one piece at an angle about 130°, to hang within the box on two pins or bolts, thus forming a swinging shutter. A rack is attached to the front of the shutter to regulate the movement.

The advantages of this apparatus are—the cooling of the boiler is entirely avoided, the gases are consumed so that smoke is prevented, and there is a saving of from 15 to 20 per cent. of heat and coal.

In ordinary open firegrates the same object is attained—viz., the prevention of the cold air from coming into contact with the green coal, by removing the fire-lump, and substituting for it a cast-iron box, which stands out at the back and is open in front only, and which is filled with coal. Within this box is a movable iron plate, which can be forced forward, carrying with it the coals from which the gases have been extracted and consumed by the heat in front, or moved backwards when the box wants refilling. To regulate the draught so that the fire burns brightly in front, a plate is fixed under the grate, coming forward at the bottom. Another plate, resting on pins, is placed on the top of the box to prevent the flame entering the register.

By this simple apparatus a bright fire is maintained in front of the grate, half of the heat usually escaping into the chimney is saved, there is little or no smoke, and the smallest coal can be used, and is, indeed, preferable.

In kitcheners, stoves, and vertical boilers, a similar box to foregoing can be fixed, the moveable plate being worked by a lever.

This invention is also of great importance to railway companies, as it can easily be applied to locomotives. A box is placed under the footplate, the whole width of the fire-grate, and the coals put in from the top. By this means the gases are almost entirely drawn out of the coal and consumed, the result being very little, if any, smoke. To supply the grate, the coal is pushed forward by a movable plate and lever.

Whether applied to furnaces, ordinary open fire-grates, stoves, kitcheners, vertical boilers, or locomotives, the results of this invention, in each case, are a great saving of heat and fuel, and the reduction of smoke to a minimum.

PARQUETRY AND DECORATIVE WOODWORK.

PARQUET flooring is now so generally adopted by architects that nothing need be said of its advantages over the ordinary kinds of flooring; but, as a decorative adjunct to carpeting and furniture, we are rather surprised this material is not more generally used as a border round rooms and halls. Messrs. A. J. Arrowsmith and Co., of 80, New Bond-street, the original patentees of the "solid parquet flooring," have a large display of dadoes and borders of this material. Their solid parquet dadoes present a richer and more decorative effect than the ordinary framed kinds, and we were pleased with a design showing a guilloche pattern in parquetry introduced below the dado mouldings as a frieze. A border of this kind is inexpensive, durable, and ornamental. In another design the parquetry is introduced in the panels, superseding carving; while being a smooth washable surface, its value as a sanitary mode of wall-lining admits of no question. The design executed by this firm for the Council Chamber of Bolton Town Hall, of which Mr. Hill was the architect, has a bold guilloche treatment in dark inlay and oak, very suitable for large assembly halls. The same firm have introduced parquetry into the new offices at Birmingham, under Mr. Yeovill Thomason. The "solid parquet-flooring" is well known by the profession: it is made one inch thick, both sides are alike, and the pieces are tongued and keyed at back. A thin parquet or veneer is manufactured also for laying on old floors.

We noticed also a few chimney-pieces and overmantels, in the Italian and Adams Brothers styles, executed in oak, walnut, &c., with bevelled mirrors and carved panels, and shelves for china. A large oak and ebonised chimney-piece with a deep embossed leather cove, drew our attention, it being constructed with square bevelled mirrors in the frieze or mantel, with ebony turned balusters between. These were placed slightly in front of the glass and supported the mantel-shelf. The jambs were relieved by coupled Ionic pilasters. A chimney-piece in carved-oak, Italian style, and several designs for furniture in Late Revival styles, painted tiles for panels and decoration, are a few of the objects in Messrs. Arrowsmith's showrooms worthy of a visit.

Building Intelligence.

COTHERSTONE.—The foundation-stone of St. Cuthbert's Church was laid on the 2nd inst. by Mr. W. Ambrose Morrice, of Rokeby. The church is in the Early English style, and is to be built of local stone, squared, with rock-face masonry on the exterior; the interior face being axed. The dressings are all of Dunhouse stone. The nave is 45ft. 6in. in length by 25ft. in width and 33ft. in height. The chancel measures 22ft. by 18ft. The tower, which is 12ft. square internally, is to be 43ft. in height, and is surmounted by a spire 26ft. 6in. in height. The church has a small vestry, beneath which a vault is provided for the heating apparatus. The tower has a ringers' floor, and above it a belfry arranged to contain six bells. Access to the tower is obtained by a circular stair-turret. The roofs of nave and chancel are to be of open-timber work, stained and varnished, and covered externally with slating. The slating is arranged in alternate bands of blue and green slates. The floors under seating are of wood, all other portions of flooring will be in encaustic tiles. The windows will be glazed with green and yellow cathedral glass. The entire cost of the church, estimated at upwards of £2,000, is to be defrayed by subscriptions. The architect is Mr. C. Purdon Clarke, Sheffield-terrace, London. The work is being carried out under the superintendence of Mr. T. Streeter by Mr. Kyle, of Barnard Castle, the contractor.

SACRISTON.—A new Catholic church has been erected at Sacriston, county Durham, from the designs of Messrs. Dunn and Hansom, of 2, Westminster Chambers, Victoria-street, S.W., and of Newcastle-on-Tyne. It is a simple unpretending structure of red bricks in two shades of colour, and pitch-pine wood construction. The circular-headed windows and doors of moulded bricks, brick corbellings, and well proportioned buttresses give it a good deal of character. The plan consists of a nave 63ft. by 23ft., opening into one aisle, on the south side. There is a chancel 22ft. by 17ft., with two small sacristies adjoining. A bell-cote of timber and lead stands on the roof at the intersection of nave and chancel. The accommodation provided is for somewhat more than 400, and the cost has been under £1,000, a successful specimen of cheap church-building.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

OXFORD ARCHITECTURAL SOCIETY.—On Saturday the members of the Oxford Architectural Society, to the number of about 80, paid a visit to Windsor Castle and Eton College. Arrangements had been made for conducting them over the Castle, St. George's Chapel, and other places of interest, by the Rev. Canon Pearson and Mr. J. H. Parker, C.B. The party reached the Castle shortly after 2, and was at once conducted through the State Apartments. In St. George's Hall Mr. James Parker read extracts from a paper which he had prepared on the foundation and early history of the Castle, from which, by the aid of a coloured plan which he exhibited, he conveyed to his hearers a tolerably clear idea of the gradual growth of the Castle under successive monarchs, and of various alterations and additions that had been made to the building

from the earliest period down to the present time. The party afterwards inspected the Albert Memorial Chapel and St. George's Chapel. At Eton College, where the visitors arrived about 6 o'clock, the quadrangle, cloisters, and other parts were duly inspected, but the chief interest was centred in the chapel and cloisters.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—The annual dinner was held on Thursday evening (the 9th inst.), at the Grand Hotel, Colmore-row. The retiring president, Mr. Geo. Ingall, occupied the chair, and among those present were Messrs. J. A. Cossins, R. B. Morgan, H. H. McConnal, H. Clere, A. Reading, T. Jones, Fred. G. Hughes (hon. secretary), &c., also Mr. T. W. Camm and other visitors. Apologies for non-attendance were received from Messrs. Yeoville Thomason, W. Hale, T. H. Mansell, E. Pincher, J. Roddis, J. W. Tonks, &c. After the toast of "The Queen," the president proposed "Success to the Birmingham Architectural Association." The next toast was "The Profession," proposed by the president and responded to by Mr. Cossins, who then proposed "Kindred Arts," to which Mr. Camm responded. The other toasts were "The Honorary Members," proposed by Mr. Morgan and responded to by Mr. Clere; "The Retiring President," proposed by Mr. McConnal, "The Retiring Committee" coupled with which was the name of Mr. Morgan, and "The Hon. Secretary."

ARCHÆOLOGICAL.

THE ROMAN VILLA NEAR BRADING.—The second edition of the "Guide to the Roman Villa, recently discovered at Morton, between Sandown and Brading, Isle of Wight," which has been drawn up by the excavators of the buildings, Messrs. John E. Price, F.S.A., and F. G. Hilton Price, F.G.S., contains an account of 19 chambers which had been laid bare up to the time of its issue. During the last few weeks these gentlemen have uncovered a dozen more chambers, making 31 in all. Of the 12 just brought to light two are of large size, one of them measuring 54ft. by 22ft. It had pillars on two sides to support the roof placed against the walls, as the discoverers found large blocks of stone and concrete which formed the foundations. There were smaller chambers flanking on either side this very large one. Continuing due east and joining the last-named is another room, nearly 40ft. by 32ft., and on the south and east sides of it are more solid blocks of concrete at equal intervals. On the north side, at a distance of 8ft. from the north wall, are three of these blocks, corresponding with those on the south side. Seemingly, this chamber was approached from the east through a vestibule, since at regular distances four more blocks occur, which likewise correspond with those opposite. Comparatively few remains beyond roofing slabs, bits of pottery, and a quantity of bronze, consisting of a lock-plate and studs for the ornamentation of a chest, were discovered in these large chambers. Another interesting feature, which yet remains, however, to be worked out, is the appearance of a roadway. Adjoining the wall of the last-mentioned chamber is a well-house, with two semicircular apses. The well itself has been sunk to a depth of 80ft., and water has been found: still, the bottom has not been reached as yet. In excavating it a large quantity of bones of the horse, ox, sheep, dog, and pig were met with, as well as fragments of pottery in masses and stones. Southward of the supposed roadway, which runs by the side of the outer wall, is a large open space. From the fineness of the soil it is supposed to have been the garden, and upon its western side is the foundation of an alcove or hemicyclium. An interesting chamber, nearly square, and resting on a solid foundation, has been discovered on Mrs. Munns's side of the site. This room yielded a bracelet in bronze, a fibula, and a considerable number of coins. These last range in date from Domitian (A.D. 81-96) to Valentinian (A.D. 383-392). Every effort is now being made to bring about an amalgamation of the excavations, which cover two separate freeholds, one belonging to Mrs. Munns and the other to Lady Oglander.

The first stone of a new Baptist chapel was laid laid last week at Lifton, Devon. It will measure 32ft. by 21ft, and will seat 100 persons. Mr. White, of Halwill, is the builder.

"To a practical man with a taste for mechanics, and the bumps of constructiveness fairly well developed, we can conceive no higher mental treat than a couple of hours spent over the June numbers of that truly marvellous publication the *English Mechanic*. In a hundred and fifty odd pages that make up the bulky mass of letterpress, there is recondite information on almost every conceivable subject, ranging from how to construct a mouse-trap, to the latest method of calculating the phases of Orion.'—*The Brightonian*. Price Twopence; of all newsmen, or post free 2½d.—31, Tavistock-street, Covent garden, W.C.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

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N.B.—Cases and vols. must be ordered through a bookseller or newsagent, as the regulations of the Post-office prevent them from being sent by post.

RECEIVED.—Canon D. of W.—Dr. C. W.—P. J. D.—R. P. S.—C. and E. A. P.—B. T. W.—H. B.—Z. S.—E. J. W.—J. M.—C. W. H.—H. S.—H. M'L.—E. W.—D. P.—E. M. B.

A. TAYLOR. (We do not know the book.)—ARCHITECT. (At Hammond's, in Chandos-street.)

"BUILDING NEWS" DESIGNING CLUB.

SUBJECTS.

A. A design for a stable and coachhouse for two horses and cob, suitable for a country residence. Plan, elevation and sketch. Scale, 8ft. to the inch.

B. A small conservatory attached to a house, 18ft. by 12ft., and 6ft. to the eaves. Scale, ⅛ths of an inch to the foot.

NOTICE.—These will be the concluding subjects for the present year.

DRAWINGS RECEIVED.—Jack, Vignette, Per, Bonus Hominus, Pupil J., Ambition, Walter H., Hubert, Beta.

Correspondence.

RECENT ELECTION AT THE ROYAL ACADEMY.

To the Editor of the BUILDING NEWS.

DEAR SIR,—I think your correspondent "A. B.," in his letter last week upon this subject, is not correct in saying that it "seems to be more particularly the case with regard to architecture, that men of distinguished mark are passed over by the Royal Academy, and others of less note are elected."

I believe that in the present day few acquainted with architecture who looked through the list of Academicians and Associates would assert that architects were represented by second-rate men.

It is to be regretted that Classic work is so badly represented.

I fancy the three men "A. B." is so much in favour of are more or less Gothic men. In any case, why should they not stand outside the door longer? Upon what grounds would "A. B." have had any one of them admitted before the man who was so close upon the heels of the last elected Architect Associate?—I am, &c. ONE WHO WAS NOT SURPRISED.

June 16.

BUILDING-STONES.

SIR,—Remarking upon the correspondence which has appeared in your and other publications respecting the stone to be used in the building of Truro Cathedral, it has occurred to me that the benefit of some twenty years' experience of the use of every description of Bath stone, upon the sea-coast and other exposed situations, may not be without value during the present controversy.

The first lesson I have learned is that of all the Bath oolites, the Box-ground is the very worst to be exposed to the action of a saline atmosphere or strong south-westerly gales. The effect of the elements, in such positions, will, in less than twenty years, corrode or eat away the soft parts of this stone to a depth of ½in., leaving standing the flint particles with which this stone abounds.

A century of such action must then have the effect of entirely destroying the contour of all moulded or carved work.

If used in the way hereinafter to be described, I have found Corsham stone much the most preferable for exposed situations; but it is of paramount importance the stone be quarried between March and September, so as to insure as long a seasoning as possible. Then the stone must be completely finished upon the banker, and the pointing completed at the time of setting—any after-cleaning or dragging down, the delight of the modern mason, must be avoided as would a pestilence; the glaze formed upon the surface of the stone by the action of seasoning, and which is so hard to cut through after three or four months' exposure, being the best possible protection against the grading action of the elements.

The practice of cleaning down has always seemed to me to be most wasteful and injurious. Not only is it far more expensive than completing the work as it proceeds, but it completly destroys the character of the masonry, by taking away from it the expression which distinct and well-defined joints always carry.

I have been much surprised that architects have not more recognised this principle—one which, in the use of Portland or other hard stones, they are compelled to adhere to.

But by far the best and most reliable of either of the oolites, for using in this way, I have found the Painswick, or really the Avening stone; as this may with the greatest reliance (if used under the conditions described above) be placed in the most exposed positions.

The innumerable buildings scattered around the Gloucestershire hills bear most undeniable testimony to the truth of my statement.

As regards cost of this stone, I calculate it would be about one-third more than Corsham and one-fourth more than Box-ground or Coomb-down.

In conclusion, I would just remark, I have rather wondered at seeing no allusion to the use and cost of Caen stone. It strikes me (but writing without experience as to prices at the quarry) that in large quantities this stone could be supplied at but little, if any, increase over the cost of Bath.

As the committee have not yet arrived at a decision, I trust these suggestions may, if they merit any, receive consideration. I enclose my card, and am, &c., DURABILITY.

BEER STONE.

SIR,—I cannot, of course, expect everybody to endorse my views: there are too many adverse interests at stake. "West Countryman" is offended, it seems, because he was told that the outside of Exeter Cathedral was of Beer stone, and he found it otherwise. I, however, am not responsible. I also examined the outside, and came to the conclusion that the stone used was mainly Caen, and I think it desirable that this should be known. The upper stage of the chapter-house is, however, an exception, concerning which there is plain documentary evidence. In Britton's "History of Exeter Cathedral," the author says of the chapter-house, "Bishop Lacy's work probably commenced about the year 1427, when John Wolston and John Harry, Freemasons, were sent from Exeter to Bere to provide stone. In the roll of 1429-30 is an entry of 64s. for 32 cartloads of Bere stone, purchased at the quarry, and another of £6 18s. 6d. for the carriage of same to Exeter. In 1434-35 is the charge of £6 19s. 4d. for 32 waggon-loads, and in 1438-39 the purchase of 48loads of Bere stone

is recorded. There can hardly be a doubt but that this stone was used in the construction of the chapter-house."

So says Britton; and as the architecture of the upper part of the chapter-house perfectly well agrees with the style of the period named, there seems no reason for question. I advise "West Countryman" to walk round the chapter-house—he can obtain easily permission to the Bishop's garden—and look at this specimen. So far as I could see, it is in excellent condition, and I say with confidence that 540 years in a city atmosphere is a very sufficient test of the durability of a stone. Britton also says that the great proportion of the expenditure entered in the roll 1340-41 is for stones, chiefly "Bere stone," so that it was extensively used in the church somewhere. Bishop Lyttelton, who also inspected the rolls, says the vaulting is of Bere stone. "West Countryman's" horror of white is amusing. The sacred writers regard white as significant of what is glorious and beautiful. So think I. He ("W.C.") does not remember that the choicest works of art in sculpture and architecture were executed in a pure white material—marble. If he had been an *East* countryman, and had seen the architectural splendours of Athens or Rome in their zenith, how horrified he must have been, all in pure white! But Bere stone is not white, though lighter than Caen. The colour is not objectionable, but even if it was, durability is of far more consequence.

In Axminster Church, the 12th century door in Beer stone, though in its re-erection it was knocked about, shows no trace of decay from age. As a contrast, the parapet of north aisle, built about 20 years ago I believe, is of Ham Hill stone, and in a wretched state of decay. With such evidence, who would not prefer the light stone to the dark?

Mr. Isaac Sumsion appears to think that I submitted specimens of Bath stone for experiment by Mr. Kirkaldy. I did nothing so foolish, as I could not possibly expect faith in such. The Bath stone quoted is from "Spon's Pocket Book," and unquestionably is to be relied upon as a fair average. I do not understand how Mr. Sumsion's stone can be so different, and certainly the circumstance of one specimen bearing 108lb. and another only 84lb., does not give assurance. This was not the case with the specimens of Beer stone; Mr. Kirkaldy remarked upon their uniformity. But it is not in respect of its carrying qualities that objection is made to Bath stone. The weakest kind would be acceptable if it was only weather-proof. Perhaps the most conclusive evidence in respect of it is seen at Bath. Though an ancient city, and one which in the middle ages would, no doubt, from the contiguity of the quarries, possess handsome churches, town hall, merchants' houses, &c., yet it is now vain to seek for the least trace of antiquity *above* ground. Modern improvements cannot be answerable entirely for this. The Abbey alone stands, and that, though only Late Perpendicular work, illustrates the same fatal fact that Bath stone is *not* durable. It is scarcely worth while to adduce proofs of failure in London. I will, however, name three, because in these cases care was probably taken to get the best stone. Henry VII.'s chapel, restored in Bath, needs again thorough restoration. The east front of Buckingham Palace, built about 30 years since, and though soon after painted to preserve it, shows signs of decay on south side, and masons were lately engaged, I noticed, on the centre balcony. St. Peter's Church, Eaton-square, is the third instance. It was built, I believe, by the late Wm. Cubitt. The portico seems to have been treated with some composition, but is in a state of rottenness.—I am, &c.,

PHILIP E. MASEY.

ENGLISH AND SCOTCH PROFESSIONAL PRACTICE COMPARED.

SIR,—With reference to Mr. John McLachlan's remarks (reported under the above heading in your issue of the 3rd inst.) touching the difference between Scotch and English charges for quantities, and his proposal of levelling down, I would like to remark, first of all, that money is of much less comparative value down here at the *squab* end than up yonder at the "knuckle," as I myself have experienced (having studied in Aberdeen), and as that canny Scot found out to his cost, who "had not been in London above half an hour before bang went saxpence"; and secondly, that according to the account Banister Fletcher gives of the Scotch method, it goes much less into detail and involves far less labour than ours, and, therefore, necessitates more guess-work on the part of the builders, and in most cases comes dearer to the client in the end.

I am well sure that if an architect does his work thoroughly, giving proper study to the drawings and specification, and efficient supervision, and also taking out the quantities accurately in detail, he will work very hard, and his assistants will do likewise, for very low pay; if he do not, even at the full commission, find himself much worse paid than the members of other professions, even the general run of clergy and medical men, not to speak of lawyers, still less of peers, princes, and the rest whose acknowledged function is "gracefully to do nothing." The barrister, solicitor, butcher, greengrocer, and bill-sticker make their fortunes and dwell at ease; but how many architects do so? A few of the burning and shining lights of the profession may; but assuredly if ninety-nine out of every hundred do not work *hard* for what they get, it is only because the exceptions scamp their work at their employers' cost. These are not the days for reducing charges all round (though young men may often advisably do so to secure a connection), while expenses of all sorts are continually and rapidly increasing, and the value of money daily grows less. What we want is improved work. Let us see that we all earn our pay, as we fully do if our work is sound and economical; not sink to the cheap, which involves the nasty, and is the dearest of all.—I am, &c.,

Reading, June 14. WM. SIMMONS.

SANITARY PLUMBING AND PLUMBERS' WORK.

SIR,—The letter under this heading, at pages 687-8, from Mr. P. J. Davies is very good, while it helps to support the old adage that "the onlooker sees most of the game." It does not necessarily follow, however, that if the critic had been among the players, he would have done any better than they. In fact, Mr. Davies' remarks show that he is no more perfect than his neighbours, for he forgets to inform the "less initiated" what material to use for "soiling" the pipe, and also how to make it. Now, all this information, including what Mr. Davies states about greasing the shaved part of the lead, was published five years ago in my book on "Plumbing," and nearly five years before that in the pages of the BUILDING NEWS; further, in "coming to the rescue," Mr. Davies also omits to tell the "less initiated" what was published so long ago in those pages, viz., how to make the soldering cloths. I was not aware, until Mr. Hellyer mentioned it, that it was so general in London practice to buy the solder ready made. In my book on "Plumbing" I mentioned how to make up various kinds of solder.

I do not admit that, as Mr. Davies asserts, a plumber who uses compasses to mark off the cleaning of a joint is not a skilled workman. It all depends upon circumstances. A man may work on Mr. Davies' plan without compasses; but if he takes the notion to use them occasionally, *that* is no proof of being unskilled: the compasses may be lying handy at the time, being required for some other purpose.

Mr. Hellyer's caution to plumbers not to sink the shavehook too deep into the lead is one which many plumbers should remember. After the pipe has been cleaned, the tallow should be rubbed over the "smudged" part as well as on the cleansed, as that allows the solder to be easier wiped off.

In regard to soldered joints "sweating," *i.e.*, allowing the water to leak or percolate slowly through the solder, I think there is another reason for this than coarse solder (allowing the joint is solidly made)—viz., turning on the water, or pouring water upon the joint before it has become properly "set" or cold. In this light the rubbing over of the warm joint with tallow, may only act as a charm, the real good being done in giving the joint time to get quite cold. In this reference I allude especially to joints that have to bear a strong pressure of water.

In regard to certain kinds of pump-water attacking the tin in the solder, and assuming the correctness of what Mr. Davies states in his "sixth" paragraph, p. 688, would it not be better and easier to merely use either a strip of lead or of very coarse solder, and put it on with a copper bolt or "bit," at the slip of the two pipes, then over that make the joint of ordinary solder and overcast it if wished?

In regard to solder joints made with the copper bolt, there is a right and a wrong way of making them. The right way is to go round the joint first at one end, leaving the solder thin at the outer edge and thick at the centre of the joint, then go round the other end in like manner, and so as to finish as we go.* The wrong way, which some plumbers and tinkers adopt, is to go round the joint so as to leave the solder very thin at the centre of the joint and thick at the outer edges; this allows the joint to be easily broken in the middle.

As proving the great interest he has taken in the advancement of plumbing in bygone years, Mr. Davies referred me to four of his patents; but these, so far as I had time to see, were simply for certain kinds of valves and cocks, and upon asking a Glasgow metal merchant, long in the trade, if he knew anything about Davies' cocks or valves, he said no, but he could supply Tylor's. Do Messrs. Tylor and Sons supply Davies' articles as their own, and without his name? If so, I may be excused being ignorant of the name of Davies in the above connection, and it would have been more to the point had he been able to refer me the back pages of such publications as the BUILDING NEWS, which is largely read by practical sanitarians, or to the *Plumber and Decorator*, which especially addresses itself to plumbers. I find, however, that Mr. Davies has not been idle, especially of late, as a London plumber who reads the BUILDING NEWS, and whom I thank, has kindly sent me a copy of the *House Decorator and School of Design*, for May 26th, 1881, in which I see Mr. Davies is giving a series of articles on plumber's work. As a Scottish-bred plumber, I could hardly be expected to go to the *House Decorator* for plumbing. From this one article by Mr. Davies, I see he shows the plumbers, by a careful drawing, the *wrong* way to turn over sheet-lead and lead-pipes! Now, if he compares Fig. 132, p. 6 of the BUILDING NEWS, for January 3rd, 1873, Mr. Davies will there see the right way to turn over lead, viz., over a rounded edge, and not over a sharp one. I pointed out, years ago, that a soft metal like lead, when turned over a sharp edge, was often found cut there, especially in the case of pipes. I apologise to Mr. Davies for mentioning this; but I have done so to show him that he has been a little too hard upon Mr. Hellyer for not saying all he imagines he should have said. Mr. Hellyer said so much well, that he might have been forgiven for not saying more at that particular time. A generous emulation is commendable, but carping jealousy is to be condemned. Mr. Davies, from his ability and training, can well-afford to act up to the former, and I wish him all success in his work—there is plenty of room for us all.

In reply to Mr. Margetson, p. 688, I, of course, admit that a man's training as a civil engineer is to be made available if he afterwards becomes a plumber: he will find it useful and valuable; nevertheless, a man may be a good plumber without that training. Let the lad when at school, or at a night-school, when serving his apprenticeship, learn drawing, and get a knowledge of the principles of his trade, and he may become a good plumber, more especially now with the aid of the treatises that have been published of late on Plumbing.—I am, &c.,

W. P. BUCHAN.

BATALHA CHURCH, PORTUGAL.

SIR,—In the article under the heading of "The French International Congress of 1878," in the BUILDING NEWS of the 10th June, just received, I notice that, in a description of five of the principal churches of Portugal, by a Lisbon architect, he points out the resemblance between English Cathedrals and the church at Batalha, the design for which has been ascribed to Stephen Stephenson, an English architect. But in an "Additional Note" at foot of the list of subscribers, in Murphy's work on the Batalha Church, it is stated that, "Since the former sheets of this work were printed, the author has been favoured by the Rev. Herbert Hill, chaplain to the British factory at Lisbon,

* At chemical works plumbers sometimes put on a small body of lead with the blow-pipe at the joint (to keep the liquid from the solder) then for strength an ordinary solder-joint is made over that. Has Mr. Davies tried the lamp shown at page 688 for a similar purpose? The bottom of a lying joint would be difficult to do.

with an extract from a Portuguese historian, wherein are ascertained, apparently from good authority, the name and country of the architect of Batalha. The following is a translation of the passage:—'Fr. Luis de Sousa, in the "History of the Dominican Order," Part I., and D. Fernandes de Menezes, Count de Ereiceira, at the end of the "Life of King John I.," have both described the royal monastery of Batalha with all the exactness and elegance which it well merits. To these authors I refer the reader for an account of that noble edifice; and lest my unpolished language should sully its renown, I shall only observe that the architect of it was an Irishman named David Hacket, who then lived in Vianna da Caminha, as may be seen in one of the memoirs of Fr. Antonio da Madureira, a Dominician friar and a celebrated genealogist.'"—I am, &c., M. MORRIS.

HYDRAULIC MORTARS.

SIR,—The very valuable paper by Dr. Michaëlis, of Berlin, in your issue of the 10th inst., upon the effect of the desiccation of the calcic hydro-silicate, is of very considerable importance to practical men. The illustration of the shrinkage which takes place in calcic hydro-silicate can be demonstrated in the following manner:—Prepare a large quantity of water holding in suspension ground flint, then add such a quantity of lime-water as may be necessary to precipitate all the fine particles of ground flints; the calcic hydro-silicate will thus be formed in the gelatinous state. Draw off the surplus water, and dry the jelly until it comes to the condition of clay-powder used in making tiles, and compress the powder into a stone jar, using as much force as possible in ramming. In course of time, this calcic hydro-silicate shrinks to such an extent as to become divided into irregular-shaped hard masses, of from two to four cubic inches, but after that no further fissures appear in these detached pieces. This experiment illustrates, in a very exaggerated way, the shrinkage which takes place in the gradual drying of neat Portland cement, even although that cement may have been compressed by working the trowel on the surface until the cement sets, as is evidenced by the fact that surfaces of Portland cement thus prepared become covered, in a few years' time, with a network of fine fissures, dividing it into irregularly-shaped figures, of from one inch superficies or more. The question for practical men is this, Does that shrinkage continue till the whole surface becomes disintegrated, and are those fissures of such a character that frost will further disturb the surface? I am of opinion that when the fine fissures are formed no further disintegration will take place, and that if the coating of cement is over ¼in. in thickness, frost will not disturb the surface. I am also of opinion that these fine fissures have a gradual tendency to be silted up with carbonate of lime. The subject is, however, one of great importance, and I hope some other correspondents will give the result of their experiences. A. C. P.

Stretton, Parkstone, Dorset, June 13.

THE WINCHCOMBE SCHOOL-BOARD COMPETITION.

SIR,—A paragraph in your last issue details the proceedings of the Board in making a selection of the designs for the above schools.

There appears to have been considerable injustice done, and, consequently, great grounds for complaint. Definite instructions were issued as to accommodation required, and we now find that the one who *departed* from such has been accepted. Surely the Board must have discovered in the mean time that other accommodation was necessary. In any case they should have been honourable enough to give the other 17 architects an opportunity of providing such, whereas they allow them to go to the expense and trouble of completing their designs without having the least chance of success.

As a suggestion, we think it would be a good plan if the Institute, representing the profession as a whole, would enter an official protest in such matters, as in cases of this description individual complaints seem of no avail.—We are, &c.,

CHATTERS AND CHANNON.

Colmore-row, Birmingham.

P.S.—In your announcement last week our names were incorrectly given as Chatters and *Chandon*.

BUILDER AND ARCHITECT.

SIR,—"Roos," in the Intercommunication column of last week, makes a statement, and gives a challenge. The statement probably is, with yourself and some of your readers, open to doubt; I, therefore, leave it. The challenge I accept. Before answering his questions, I will criticise them. First, an important admission is implied; by saying "modern times" he grants that I am right as to ancient times; second, what is meant by "modern times," and when does that period commence? Many eminent historians date that period from the capture of Constantinople by the Turks, and the fall of the Byzantine Empire. The same period marks the Renaissance revival in Italy, and within a short time thereof we have the sixteenth century, since when, according to Fergusson, one of the best of architectural critics, not one successful building has been carried out. These times, I expect "Roos" will at once say, are too distant; therefore, I will suppose that the accession of the House of Hanover on the English throne will serve his purpose. Third, can "Roos" name himself any building, whether by architect or builder, that is, at the same time, "an artistic success," and "that has proved a financial success to client"? The only buildings that I know of that are financial successes are anything but artistic, music-halls and taverns being examples. In accepting the challenge, I will give two examples that are fairly artistic successes (Fergusson, on the whole, being right); the first is the Eddystone Lighthouse by Smeaton, the second I found illustrated in the BUILDING NEWS of June 7, 1878, it is the new Dominician Convent at Wicklow, Ireland; in the description whereof we are told that Mr. W. Hague is the architect, the works being carried out under his sole control, assisted by a clerk of works, no contractor being employed. The first-named is renowned as "constructionally sound," and there is no reason to suppose that the second is otherwise. I also read of another recent monastery where the works were carried out quite according to the old style, under the directions of one of the monks. Certainly "Glastonbury," the R.C. priest in Disraeli's "Henrietta Temple," is a better specimen of the "builder-architect" than "Pecksniff" in Dickens' "Martin Chuzzlewit" is of the architect. I expect "Roos" intended his third question to mean that the client is more satisfied when the accounts have been settled through the intervention of an architect than with the builder-architect himself. I do not agree with him; satisfactory and unsatisfactory examples may be quoted on both sides, the satisfaction in closing the accounts resulting more from the moral character of the one employed, than from the nature of his business.

"P. C." is wrong when he implies that a firm of standing is able to prepare well-designed elevations and better-prepared plans than the vast majority of architects. First, in good work, the elevations and plans cannot be prepared independently of each other. Second, it is rather absurd to speak of a firm designing; one of the firm may do so, and another may give important suggestions, but they cannot both be said to design. Third, can he deny that the case is that the firm employ a third party to make the design, that third party becoming, as stated by "Country Architect," the paid servant of the contractor; it is the case that a few of the best building firms in London employ permanent assistants, who are well qualified to prepare designs; first-class foremen superintend the carrying out of the works, so that the construction is good, and the accounts are often settled to the satisfaction of the client. The client in these cases obtains more satisfaction in every way than if he went to a second-rate architect, though I believe he would have the same, if not a far better, result by going to a really good architect. The client is afraid to trust himself to a young man, though often, were he to do so, he would be well pleased. He does not like to go to a well-known man, for fear that he might spend more than he intends. I forgot to say that the firm of builders employed cannot be called architect-builders, and neither can the assistant be called an architect; the case is that an architect is not employed. "P. C." cannot hurt any good architect by the unjust inference conveyed at the end of his letter; any good architect would be as much at home on the works as when seated at the drawing-board.

"W. M.," I must infer, will not learn the lesson that what disgrace a man are his actions, and not what he calls himself; ignorance is not disgraceful unless a man refuses to learn, though deceit and fraud are. The true builder-architect of the present day calls himself such because he does not know what is meant by architect; he only knows that other men who look after buildings call themselves architects, and, since he does the some, why should he not call himself an architect? It is ignorance on his part, and no disgrace attaches to him. He will build a shed, cottage, or meeting-room sound and substantial, as his father did before him, and his work is often more worthy to be called artistic than that of one who disgraces the profession by calling himself architect only. Will "W. M." please to tell me when I made "London an exception to the disreputable rule of combining the profession of an architect with the trade of a builder." I consider that the jerry-builder is no more deserving the name of builder than he who cannot design or superintend the execution of works the name of an architect. Further, no sensible man can be insulted by ignorance, for that is generally the cause of the advertisements he refers to. What are we coming to, one business split into a dozen?—I am, &c.,

HUGH M'LACHLAN.

45, Fenchurch-street, London, E.C., June 14.

SIR,—Having read in your paper a letter concerning the above from a correspondent signing himself "M.," I can bear witness to the truth of his statements. I also think, with him, that this question is assuming alarming proportions. This matter is not confined simply to dwelling-houses or mansions, as there are a great number of warehouses in London being built under precisely the same circumstances. Passing in and out of the Brighton and South Coast Railway, London-bridge station, every night and morning, I have watched with some interest the construction of a warehouse of gigantic proportions just outside the station on the right-hand side. Happening to be passing that way on foot, I found that several more were about to be erected on a large plot of land having frontages in Bermondsey-street and St. Thomas's-street. I should think that at least £20,000 will be expended on this spot. On inquiry as to who the architect was, I was informed by a very intelligent workman that the buildings are being constructed from the designs, and under the superintendence of, a gentleman in the builder's office, who is not an architect. I will make no further comment, but leave the matter for the consideration of the numerous readers of your very excellent paper.—I am, &c., N.

SIR,—In answer to "P. C." in your issue of the 3rd inst., I assert that though a respectable firm of builders *employing a good architectural assistant* may design an ordinary commonplace style of house as well perhaps as some architects, yet in a work of importance, requiring some originality and some fine-art character, they could stand no comparison with a thorough architect who makes his own designs.

As to the employer of an architect being in "a happier frame of mind after the accounts are paid," I should say certainly he would be, or ought to be, as by employing a gentleman and man of taste he would have some assurance that the work done was of a good class, in conformity with the canons of art, and that he had not paid more for it than was right and proper.

I am astonished by the idea of anyone paying an unchecked builder's bill.—I am, &c., M.

TENDERS—A CORRECTION.

SIR,—In your last impression, under the head of Tenders for Building, there appears an inaccuracy, viz., for the Dwelling-house in the Brownlands-road, Highgate, for Mr. R. M. Turnbull, a Mr. J. O. Richardson is mentioned as the successful competitor, £2,050; this gentleman's tender was £1,919. The work has been given to the competitor above Mr. Richardson, viz., Mr. D. H. G. Brown, of Holloway, £2,100.—I am, &c., W. CLARK.

CHIPS.

Wednesday, the 27th July, will be a red-letter day at Ipswich, for it has been decided to open on that day, with public ceremony, the dock entrance, the post-office, and the museum, three works of considerable magnitude just carried to completion, and it is probable that the new main sewerage works will also be inaugurated on the same occasion.

At the meeting of the Ventnor local board, held on Tuesday last, the board unanimously resolved to increase the salary of their surveyor, Mr. R. S. Scott, from £105 to £150. Several members testified to the efficient manner in which Mr. Scott had discharged his duties since entering upon the office a little more than a year ago.

At the last weekly meeting of the Cork board of guardians, five candidates were proposed for the vacant office of architect, &c., to the board. Mr. D. J. Coakley, A.R.I.B.A., of 48, Grand Parade, Cork, was elected by a majority of 8 votes over the combined votes of the other four candidates.

The memorial-stones of a new Wesleyan chapel were laid at Porthleven on Wednesday week. The building will be Gothic in style, and will measure 49ft. by 72ft., with 15ft. deep orchestra, internal dimensions, and will seat 850 persons. The facing materials are local Brent stones, with granite dressings, and all the fittings, and also the pews, will be of pitch-pine. Mr. James Hicks, of Redruth, is the architect, and the contract has been taken at £2,400.

Intercommunication.

QUESTIONS.

[6539.]—**Isle of Man.**—I propose to visit the Isle of Man during my holidays. What is there worth seeing in that island by an architectural student (who, by the way, intends to do very little pencil work during his recreation time), and which is the most attractive route from London? The whole north-west of England is novel to —AN EAST ANGLIAN.

[6540.]—**Foundations.**—I have been in practice as an architect nineteen years, and for eleven years previous was pupil and assistant with one of the largest practitioners in the Midland counties, and have always understood it necessary to underpin walls and buildings of adjoining premises when excavations for cellars or other purposes are made lower than my neighbour's foundations, and in all contracts have also held the contractor responsible for any damage done to adjoining property in consequence of the carrying out of my works. Judge then of my surprise when I am told by a solicitor that if a few days' notice is given to an adjoining owner that you intend to sink 5, 10, or 15ft. below his foundations, and that you *will not* be responsible for any damage done to his property caused thereby, the said owner is bound to protect his own premises by underpinning his walls to the same depth I wish to go, and that cases have been settled in the law-courts to that effect. Is this so, as it seems to me contrary to all reason, and is entirely contrary to the custom of this part of the country, and all practice I have ever known? Please cite cases, if there are any, in next week's paper.—JAS. FRANK SMITH.

[6541.]—**Painter's Quantities.**—Will some one please tell me how to take out quantities for window sashes and frames in painter's work, also architraves, &c.? I should like to know the London method, and also if the same measurement is adopted in the northern counties.—N. E. R.

[6542.]—**Spire Lights.**—Will some one kindly give advice under the following circumstances:—A broach-spire, having open spire-lights, is a great source of trouble in wet weather. The rain drives in, running through to the ground. It is not wished to put louvre-boards in the openings, and a roof over the bells would probably interfere with the sound. Any suggestion would be gratefully received.—ALPHA.

[6543.]—**Church Building.**—I shall be greatly obliged by a reply to any of the following queries relating to a church:—1. What is the proper method of laying a wood-block floor, and what is the relative cost between this and floor-board on joists? 2. I am desirous of having tile roofs, but a portion of the roofs are only ¼ pitch, viz., the roofs over aisles and vestries. I shall, therefore, be glad of advice as to whether I could safely use plain tiles, and the method of laying. If plain tiles are not practicable, is there any other species of cheap tile which would be serviceable? 3. What is the best and cheapest method of warming? The church is 48ft. by 86ft., exclusive of chancel. 4. How should lightning conductor be fixed? Is it connected to iron finial? How fixed in earth? 5. The size and method of fixing finial? The spire and tower are 120ft. in height. 6. The width of arches in nave arcade is 14ft., and the thickness is 18in; the height from pier caps to wall-plate is 22ft.; the shafts are circular, and 6ft. 6in. in length, and I am desirous of keeping them as thin as possible. Would 12in. be a safe thickness for Bath (Corn grit) or Darley Dale stone? 7. I shall be glad of particulars of a pink or blue stone suitable for using for internal shafts in window reveals.—YOUNG ARCHITECT.

[6544.]—**Weather Tiling.**—I am about building a cheap house for a client who thinks 9in. outer walls thick enough, and 11in. hollow ones luxurious. I propose 14in. (or 16in. hollow) ones to living rooms, ground-floor, and 9in. to offices, the whole of the upper floors (what is not in the roof) to be framed, nogged with brick, and tiled. I want to know if the tiles can be fixed to the brick and wood-work without lathing. If laths be used, would the quarters require to stand forward from the face of bricks? I presume the timbers might be 4½ by 3, and 18in. apart, unless lathing be necessary. I am acquainted with the method of fixing to a 9in. brick-on-edge wall, but don't like brick-on-edge work, and cannot afford the extra number of bricks in this case. Supposing I use lathing on quartering without nogging at all, what is the soundest finish inside? If the tiles were fastened to the bricks only, would there not be risk of the latter coming away from the timbers owing to shrinkage? I should be obliged for information and advice, having hitherto been used only to solid work—O. P. Q.

[6545.]—**Ruins.**—I should feel obliged to any one supplying me with a list of the old cathedrals and abbey churches in England now in ruins.—W.

REPLIES.

[6536.] — **Seventeenth - Century Work.** — Errata in names.—"Captain Winder" should have been "Captain Winde," and "Carolvan" should have been "Carolean."—HUGH MCLACHLAN.

[6512.]—**Metal Railing on Marble Monument.**—I would advise "J. H. B." to use a wrought-iron railing if any. Let the standards, rails, and other parts thereof, after being beaten into shape, be again brought to a white heat, and whilst in that condition be plunged into a bath of linseed oil; after the whole has been put together and fixed, it should be painted as usual. If after that it is painted once in every three or four years, no harm will ensue. If the iron were galvanised, it would also require to be painted, the raw colour being objectionable. In both cases by long neglect the oil coating and galvanising would wear off, rust would ensue which with dirt would be washed by the rain on to the marble base and cause a reddish stain owing to the iron rust and dirt entering the pores of the marble after the polish would have worn off. Bronze might be used, but it is a difficult matter to treat it artistically unless the designer understands modelling. Whatever metal be used, stains will appear at the feet of the standards when the polish has worn off the marble as the dirt will follow the rain and sink into the pores.—HUGH MCLACHLAN.

[6516.]—**External Stucco Work.**—If "Inquirer" will look to my reply to No. 6502, June 3, he will obtain some information on the subject; two papers are there referred to which I would advise him to read, also a paper read before the R.I.B.A. on "Sgraffito." It could be found by looking up the indices of back volumes, or in the *Transactions* of that body. In sgraffito work a coating of stucco, coloured if required, is laid on the surface to be treated, when this is nearly dry another coating of the same or a different colour is laid on the first, a design is rapidly traced on this or a full-sized drawing of the design required, on cartridge paper, is laid against the plaster, when a sharp tool is used to cut away part of the second coat to the required design so as to expose the first coating underneath. Pieces of coloured glass or marbles are sometimes set or inlaid in the cement in patterns, projecting if desired. The angles might be worked with vertical beads or mouldings sunk in the surface of the stucco, or simple pilasters might be used with sinkings or incisions, such work and colour would depend on the taste of the designer.—HUGH MCLACHLAN.

[6520.]—**Cubing.**—Look at query No. 6407 and the various answers thereto. There are no standard prices per cube foot, the quality of work and materials of one man are better than those of another, therefore the price per cube foot would be higher. In my experience I have seen prices varying from 4d. per foot cube for outbuildings and simple common work to 1s. 4d. for a superior mansion. In my reply to No. 6463, I put the price per cube foot of a workhouse at 1½d. to 2d. too high.—HUGH MCLACHLAN.

[6522.]—**Bronze in London.**—I believe bronze does stand the smoke of London. Instance, the lamps on London-bridge, which have been up for fifty years.—A. MCG.

[6524.]—**Damp Wall.**—I should advise "M." to use tinfoil. I have done so in a similar case, with complete success. The tinfoil should be put on the wall with white-lead, mixed with a little oil. This mixture should be passed through a painter's sieve to get rid of any lumps, &c., there may be in it. It can be applied with a brush to the tinfoil. Paste, flour-and-water that is, ought never to be used. Care should be taken that the tinfoil is not crumpled. When this is the case it can easily be made smooth by rubbing with a tablespoon or anything of that sort.—CHARLES F. MOXON.

[6525.]—**Clays, &c.**—I cannot inform "S. F. C." of any work on clays for making bricks. For tiles, the Staffordshire clay is undoubtedly the best. It is used largely mixed with fireclay to get the bricks in variable shades of colour. No doubt "S. F. C." will know that many thousands of pounds yearly are spent experimenting, and I take it that he will have to throw in his mite with the rest in that respect. With regard to brick and tile-making machinery, Messrs. Ward and Sons, Steander, Leeds, turn out excellent machinery for this purpose. Their plastic brick-making machine is, without doubt, the best out. I saw a letter from a Burnley firm who were making at the rate of 19 and 20,000 bricks per day with one of their machines. Of course they worked overtime. Perhaps it may not be out of place to say that architects and their clients are becoming aware of the vast superiority of a vitrified plastic brick over those made semi-dry.—BUILDER.

[6535.]—**Flushing Side Sewers.**—The best flushing cistern is Rogers Field's, which is perfectly automatic, having no working parts, therefore require no supervision. Full particulars may be obtained of Messrs. Bowes, Scott, and Read.—W. R. MOORE.

STATUES, MEMORIALS, &c.

MIDDLESBOROUGH.—Mr. D. W. Stevenson, A.R.S.A., has just completed the full-sized model of a statue intended to be erected at Middlesborough as a memorial of the late Mr. Bolckow, M.P. The figure has been designed in standing posture, with the left leg considerably advanced, and the weight of the body thrown on the right. The head is held erect, the face looking full in front with an animated expression, corresponding to the action of the hands, one of which holds, while the other points to, a roll of parchment, bearing the Royal seal. The height, including the plinth, is 10ft.; and the pedestal, which is being constructed of red granite by Messrs. Macdonald, Field, and Co., Aberdeen, will be 12ft. high. The statue is to be cast in bronze at Sir John Steell's foundry, and is expected to be placed and inaugurated before the end of September.

SUNDERLAND.—A drinking-fountain has just been completed for the new Roker Park at Sunderland, to commemorate the centenary of Robert Raikes. The cost has been close on £200. The style of architecture is German Renaissance of a chaste design, the central column being 14ft. in height, and is approached by a platform. There are four basins of polished granite, and on the angles are four polished granite columns with fluted capitals supporting a canopy, surmounting which is an eagle, emblematic of victory and power. On the cornice of the canopy are four shields bearing the borough arms, and on the west panel of the shaft is a basso-relievo figure of Moses striking the rock. It has been designed and executed by Mr. Borrowdale, sculptor, of Sunderland. The plumbing work is by Mr. J. G. Kitley, of Monkwearmouth. The platform to the above has been built, and the water has been laid on by the Corporation.

The foundation-stone of a new Congregational chapel, to cost £350, was laid at Berrynarbor, near Ilfracombe, on Monday week. Mr. W. H. Gould is the architect.

PARLIAMENTARY NOTES.

THE NEW LAW COURTS.—In supply on Thursday week the sum of £120,200 was voted for the New Courts of Justice and Offices.

ORDNANCE SURVEY.—On the vote of £185,000 for Surveys of the United Kingdom, Mr. S. Lefevre, in reply to a question by Sir G. Balfour, said there was a large increase in the proposed acreage of the survey this year over last. It was hoped that the survey would be completed by the end of 1890, and it was possible that the Government would have to ask at some future time for increased means of facilitating the completion, an assistance which he did not doubt the House would give. The vote was agreed to.

SOUTH KENSINGTON AND BRITISH MUSEUMS.—On the Supplementary Vote of £17,640 for erecting and maintaining new buildings for the Department of Science and Art at South Kensington, Mr. Dillwyn expressed a hope that the Government would put its foot down and stop the ever-increasing expenditure on that overgrown and to a large extent useless establishment. Mr. Lefevre could not hold out any promise that further sums would not be expended for the objects in question connected with the South Kensington Museum, which was a popular institution. Mr. Rylands suggested whether it was necesary to keep up a separate department to superintend the extension of the Museum, and whether the duties could not be taken over by the Board of Works. Lord F. Cavendish said that a considerable change had already been made in the direction indicated, and that it was worth consideration by the Government whether it should not be carried still further. The vote was agreed to, as was also the vote for £4,523 to complete the sum necessary to defray the charge for the maintenance and repair of the British Museum buildings.

THE NEW NATURAL HISTORY MUSEUM.—On the vote for £27,858 to complete the sum necessary to defray the charge for the erection of a Natural History Museum, Mr. Dillwyn moved its reduction by £8,425, being the amount demanded for the erection of a museum to contain a collection of objects preserved in spirits, regarding which the Committee had no further information. This was the first instalment, and as the original estimate of the Natural History Museum had already been greatly exceeded, he wished to check this new expenditure in the bud. Mr. Lefevre said that this was a new item, but it was considered essential to erect a new building to contain the objects preserved in spirits. It was absolutely necessary to keep these objects in a separate building for the safety of the existing museum. After some discussion, the Committee divided when the vote was agreed to by a majority of 49.

THE DUBLIN MUSEUM.—On the vote of £10,000, for building expenses in connection with the Museum of Science and Art and the School of Art in Dublin, Mr. Gorst moved that the amount be reduced by £3,500, on the ground that the entire cost of the proposed Science and Art Museum was not ascertained. Mr. Mundella explained that the late Government had undertaken to erect a Science and Art Department in Dublin, and the question of the site for the same had remained unsettled until the other day. The plans could not be prepared until the site had been obtained, but it had been thought right to ask for a sum to enable the arrangement to be proceeded with. There had not been a day lost in pressing forward the plans for this building and the object of this item of £3,500 was to prepare the foundations. The Committee divided, when the vote was agreed to by a majority of 67.

THE NATIONAL GALLERY.—On Thursday week Mr. Coope moved the following Resolution:—"That, in the opinion of this house, it is expedient that immediate steps be taken to carry out extensions to to the National Gallery, so as to afford sufficient accommodation for the present collection, and for probable future additions." The work of extension, he remarked, was absolutely necessary and could be carried out at comparatively little expense. There was at the disposal of the Government space at the rear of the National Gallery; and as it was only the first floor that required enlargement, the new building could be erected on iron columns, so as not to interfere with the present use of the space as an exercise ground for the soldiers in the neighbouring barracks. He urged that from the point of view of economy her Majesty's Government should accept his motion. At present the Trustees were empowered to expend £10,000 per annum in purchasing pictures; but if an extension of the building were carried out people who possessed valuable works of art, and had no relatives to whom to leave them, would present them to the National Gallery, and thus the annual expenditure of a large sum in buying pictures might be dispensed with. The hon. member went on to say that success had attended the adoption of his proposal that the public should be admitted to the Gallery on student's days, and he suggested that

students should be accorded an extra day, on Wednesdays. He also urged that, instead of being closed during the winter months at four p.m., the Gallery should be lighted with electricity and kept open on certain evenings in the week, so that the working classes, who were now debarred from visiting the institution during the winter months, might have an opportunity of doing so. Mr. S. Lefevre said that within the last few years £144,000 had been expended on the acquisition of land and £97,000 upon the erection of buildings for the extension of the National Gallery. He could not pledge the Government as to the course which they would take. All he could say was that they would consider the matter in reference to other demands with respect to public buildings. A number of large public works would have to be undertaken in the next three or four years, which, he thought, must have priority of the enlargement of the National Gallery. As to the large sum of £9,000 which had been paid to Lord Suffolk for a picture by Leonardo da Vinci, he believed that all competent persons were agreed that it was a very valuable picture. He fully concurred that they ought to aim at excellence in quality rather than at quantity in their National Gallery. The motion was then negatived without a division.

PATENTS.—In the House of Commons, on Wednesday, Mr. Anderson moved the second reading of his Bill for the Reform of the Law relating to Patents for Inventions.—Mr. Chamberlain admitted that the Patent-laws needed reform. There could, however, be no legislation on the subject this year, and as he thought it was one which should be taken up by the Government, he would promise to take the matter in hand at the earliest possible moment.—A long discussion followed, and ended in the Bill being read a second time.

LEGAL INTELLIGENCE.

THE RIGHT TO LATERAL SUPPORT OF BUILDING. —THE COMMISSIONERS OF WORKS AND PUBLIC BUILDINGS AND DALTON V. ANGUS AND CO.—The arguments in this appeal were heard in November last before the Lord Chancellor, and Lords Penzance, Coleridge, Blackburn, and Watson, assisted by some of the learned judges. Judgment was given on Tuesday. The respondents, Messrs. Angus and Co., are coachbuilders at Newcastle-on-Tyne. In 1849 they converted a dwelling-house in the Westgate-road into a coach factory and warehouse. In the process of conversion they removed the internal walls of their building, and erected on their own soil, close to, and in contact with, the adjacent premises, since purchased by the appellants, the Commissioners of Works, a large stack of brickwork, serving the twofold purpose of a chimney stack and a support to the main girders, which had to be put in to sustain the floors. These girders were inserted into the stack on the one side, and into the respondents' wall on the other, and formed the main support of the upper stories of the factory. The respondents made these alterations without any direct grant from the owner of the adjoining premises of any right of lateral support. The appellants, the Commissioners of Works and Public Buildings, having purchased the adjoining house in order to erect a probate office on its site, contracted with Mr. Charles Dalton, the other appellant, that he should execute the proposed works. Mr. Dalton, in the execution of the work, excavated the ground adjoining the respondents' premises, leaving a thick pillar of clay round the respondents' stack of brickwork for its support, and also placed shores to support the respondents' building. Notwithstanding these precautions, the ground beneath the chimney-stack gave way, and the respondents' building, losing its main support, fell. The respondents thereupon brought an action against the Commissioners and the contractor, which was tried at Newcastle in 1876, before Mr. Justice Lush and a special jury, when a verdict was found for the plaintiffs, with £1,943 damages. On the case coming before the Queen's Bench Division for judgment, the Lord Chief Justice and Mr. Justice Mellor, Mr. Justice Lush dissenting, decided that the plaintiffs had no right to the lateral support of the adjacent soil, and gave judgment in favour of the defendants. That judgment was reversed by the Court of Appeal, consisting of Lord Justice Cotton and Lord Justice Thesiger, Lord Justice Brett dissenting.—On the present appeal Sir J. Holker, Q.C., Mr. H. Shield, and Mr. Garthorne Hardy appeared for the Commissioners of Works; the Solicitor General and Mr. Wheeler for Mr. Dalton; and Mr. Littler, Q.C., Mr. E. Bruce, and Mr. Riddler for the respondents.—Their lordships were of opinion that the second section of the Prescriptive Act of William IV. ought to be held to apply, and that, under the circumstances, the right to support here was gained by prescription. They therefore affirmed the judgment of the Court below, and dismissed the appeal with costs.

St. Giles's Church, Colchester, is undergoing renovation. The work is being carried out by Mr. Peck, of that town.

STAINED GLASS.

THE CHAPTER-HOUSE OF WESTMINSTER.—It is proposed to complete the design for the restoration of the Chapter-house, which still continues the property of the Crown, by following out the plan originally proposed. The six great windows, with one smaller window over the entrance, are to be filled with stained glass representing the history of England as associated with Westminster Abbey during the six centuries in which the Chapter-house was connected with the historical interests of the country. The cost will be £6,000, as stated, in the first instance, to the Treasury and the Board of Works. The first of these windows, which is already in progress, will be supplied at the cost of the Dean of Westminster, and it is hoped that the public will not be slow to continue the remainder, and to complete a work which is so much needed for the proper effect of this magnificent monument of Mediæval architecture and of English history. Any contributions may be sent to Messrs. Drummond, bankers, Charing-cross.

CHIPS.

At a special meeting of the Pontefract Town Council, held on Tuesday evening, the business before the meeting was the minutes relating to the new Town Hall, and the tenders for the construction of the New Assembly Rooms and municipal offices. Sixty-four tenders had been submitted, and the Council accepted that of Messrs. Armitage and Hodgson, contractors, of Leeds, for £4,362—the lowest. The Town Clerk was intrusted to prepare the agreement for the due performance of the contract, and the works are to be at once proceeded with.

A new oak reredos, with side wings and wall framing round the chancel, has just been erected in Swynnerton parish-church. The reredos has five arched panels, the centre one containing figures of the Virgin and Child, and the four outer panels angels, with scrolls bearing extracts from "Gloria in Excelsis." These panels and also the upper-panels of side wings and wall lining are illuminated in gold and colours on linoleum. The Early English style has been adopted throughout. The whole of the work was designed and executed by Messrs. Jones and Willis, of Birmingham and London.

The memorial-stone of the Wesleyan middle-class schools at Truro was laid on Tuesday week. The buildings are being erected from the designs of Mr. Elliott Ettwell, of West Bromwich, which were selected from 12 sets in open competition. The style is Gothic, and the buildings will consist of a central administrative block and right and left wings, devoted to master's residence and servants' apartments, and a schoolroom, 65ft. by 25ft., for 170 boys, attached to the right wing. The total length of buildings is 168ft.; breadth, 104ft; and height from basement to roof, 35ft. In the centre is a square tower, 60ft. high. Messrs. Julian and Sons, of Truro, are the contractors, and the cost will be about £5,200.

While employed in the demolition of the old gasworks at Gloucester, under Messrs. Ashmore and White, contractors, a man named Newey was killed on Monday by a fall from the height of 75ft., caused by the breaking of a girder which was being removed.

A new Wesleyan chapel at Mount Pleasant, Lockwood, near Huddersfield, was opened on Tuesday week. It seats 700 persons, and cost £4,000. Messrs. John Kirk and Son, of Huddersfield, were the architects.

A new Congregational chapel was opened at Looe, on Monday week. It occupies the site of a former chapel, and is Gothic in character, and built of Liskeard stone with Portland stone, the woodwork is varnished pitch-pine. It measures 52ft. by 31ft., and seats 190 persons in the area, and 140 in the gallery. The cost has been £1,170. Mr. Snell, of Plymouth, was the architect, and Mr. Sampson, of Trehane and Liskeard, was the builder; a stained-glass memorial window, on the north side of chapel, was supplied by Messrs. Fouracre and Watson, of Stonehouse.

An iron drinking-fountain, erected as a memorial, opposite the town hall, Todmorden, was publicly unveiled on Saturday. Messrs. Smith and Co., of Glasgow, have executed the work.

It was reported to the Town Council of Dublin on Saturday that a commencement had been made with laying asphalte in the city pathways; the contract had been taken by the Mineral Rock Asphalte Company, who were laying down the first 5,000 yards of the material in Guild and Sherriff-streets.

The memorial of the demolished City church of St. Antholin, designed by Mr. H. Mathews, and erected at the expense of the Ecclesiastical Commissioners, at the corner of Size-lane and Watling-street, has just been completed. Ivy and shrubs have also been planted in the inclosure.

Our Office Table.

COLONEL and Alderman Sir William Anderson Rose, one of the senior magistrates of the City of London, died very suddenly last Thursday week, from heart-disease, while driving from his residence at Upper Tooting to his place of business at Queenhithe. The deceased Alderman, though only 60 years of age, had been ailing for some time past, and had recently applied for and obtained leave of absence for six months from his magisterial and civic functions, on the imperative advice of his doctors, who had ordered him to one of the German spas. His almost headstrong tenacity for work kept him, however, to his duties to the very last, and he died, as has been said, while on his way to business at his warehouse in the City. Sir William Rose was elected Alderman of the ward of Queenhithe in 1854, being then but 34 years of age, and in the following year, in the mayoralty of Mr. Alderman Salomons, he served the office of Sheriff of London and Middlesex in conjunction with Mr. Alderman Kennedy. In 1863 he succeeded Mr. Alderman Cubitt, M.P., after the latter's mayoralty of two years, as Lord Mayor, and it fell to his duty to receive in the City of London the Princess Alexandra on her entry there prior to her marriage with the Prince of Wales. From 1862 to 1865 he represented Southampton in the House of Commons in the Conservative interest, and in 1867 he received the honour of Knighthood. His death occasions much regret in the Corporation, of which he was an able and popular member.

MR. SOLOMON ALEXANDER HART, who had been a Royal Academician for upwards of 40 years, expired at his residence, in Fitzroy-square, on Saturday last, in the 76th year of his age. He was of Hebrew parentage, and was born at Plymouth in 1806. When he was 17 years old he was entered as a student at the Royal Academy School of Painting. After the usual probation there he exhibited a portrait miniature of his father, in 1826—his first contribution to the exhibitions of the Academy; and, in 1828, an oil painting from his brush, "Instruction," appeared on the walls of the British Institution. "The Elevation of the Law" and "Isaac of York in the Donjon of Front de Bœuf" were both exhibited in 1830, and the former, purchased by the late Mr. Vernon and added to his collection, is now the property of the nation. After the production, in 1835, of his "Cœur de Lion and the Soldan Saladin," Mr. Hart was elected an Associate of the Royal Academy. In quick succession he produced, among other works, "Sir Thomas More receiving the Benediction of his Father," "Hannah, the Mother of Samuel," "Eleanor Sucking the Poison from Edward's Arm," and "Henry I. receiving the Intelligence of the Shipwreck of his Son." The two latter works are amongst his best-known productions. Their appearance secured for him the honour of election as a full member of the Academy.

AUSTRIAN and South German papers report the death, a few days ago, of the Tyrolese painter, George Mader, at the age of 55. He began comparatively late his artistic studies, having been brought up as a miller, but his progress and success were very great. He was taught at the Munich Academy, and by Kaulbach in his private school. Later on he attached himself to Schraudolf, under whom and Hellweg he was employed on the frescoes in the Cathedral at Speyer. His chief works were the frescoes in the Brunneker parish-church, in which he displayed considerable originality, and showed a greater mastery of the technicalities of his art and greater fidelity to nature than most of the men of the Munich school. He was one of the founders of the great establishment for glass-painting at Innsbrück. He was a man of a dry, unsympathetic manner, but a real enthusiast for art.

THE eighteenth annual conference of the British Association of Gas Managers was opened at Birmingham, on Tuesday, and was attended by upwards of 500 representatives from all parts of the kingdom. The Mayor of Birmingham, in welcoming the guests, said the restrictions placed by Parliament upon the dividends to be paid to shareholders had to a certain extent removed the incentive to invention and improvement. The secretary reported that there were

now 675 members of the association. The gold medal of the association was awarded to Mr. G. Barker for his paper on the construction of gas-holders, the first premium to Mr. Frank Livesey, the second to Mr. G. Stevenson, and the third to Mr. F. W. Hartley.

THE first general meeting of the members and the honorary council of the Sanitary Assurance Association since its incorporation in February last was held last week at the offices of the association, 5, Argyll-place, W. Professor Hayter Lewis, F.S.A., vice-president, occupied the chair, and Mr. Judge (surveyor) made statements as to the progress of the association, and reported on the work that had been done. The property which had been placed on the assurance register varied in value from houses rated at £60 a year, in which the total fee to subscribers for report, supervision of work, and certificate was two guineas, to houses rated as high as £700 a year, with proportionately increased fees. The association undertakes the inspection of the smallest class of property, and no fee is charged to subscribers for a single house rated at £20, while the fee is only half a guinea for houses rated at £40. In the discussion which followed Sir Richard Temple, Captain Douglas Galton, and Mr. Whichcord spoke in support of the objects of the association. Professor Hayter Lewis, in acknowledging a vote of thanks for presiding, said he trusted that speculating builders would soon recognise the value of the certificate of the association, for there could be no doubt that houses certified as in a satisfactory sanitary condition by the association would be of greater value in consequence.

ON Tuesday the new railway between Dover and Deal was opened. The line has been constructed jointly by the South-Eastern and London, Chatham, and Dover Railway Companies. The new system, which passes through a very pretty and rich agricultural country, debouches from the South-Eastern Railway at the pier at Great-street, Dover, passing over Council-house and other streets, and thence runs on to the London, Chatham, and Dover Railway to Buckland (north of Dover Priory Station), where it curves off at a junction in Crabble-meadow, makes a *détour* round the hill at the back of Barton, and enters Guston-tunnel 1,412 yards long, at the rear of Charlton Cemetery. It emerges again in a deep cutting between Guston and Langdon, and proceeds thence to Martin, where there is a station (5¾ miles from Dover; 4¼ miles from Deal), convenient for St. Margaret's, West Cliffe, Bingwould, Sutton, West and East Langdon, and Guston. Beyond Martin Station to Walmer the line passes through another cutting. At Walmer is another station (8½ miles from Dover; 1½ from Deal), and thence the line passes into the South-Eastern Railway at Deal. There is a loop line at Minster to facilitate the direct traffic between this line and Ramsgate and Margate. General Hutchinson (of the Board of Trade) said on Tuesday that he never had to report on a railway which had been so satisfactorily constructed as to the Dover and Deal Railway. Mr. T. A. Walker, the contractor, in responding, referred to the valuable work of Messrs. Brady and Mills, the engineers.

FOR the healthiness of dwellings it is obviously an important question whether the air of the drains, charged with vapours and small organisms, moves upwards or downwards. At the instance of Professor von Pettenkofer, Herr von Rozsahegyi has recently made experiments as to this in the Ludwig and Max suburb of Munich, using sometimes vapour of sal-ammoniac, sometimes smoke from flames, sometimes sulphuretted hydrogen gas, as indicators of the direction of the air-motion, while the strength of the draught was measured with a Recknagel anemometer. The principal results of the inquiry are these:—The motion of the air in the Munich drains is much more downwards than upwards. The draught in the lower portion of the drain-system is stronger than in the upper. Upward currents occur but very seldom, and they are limited to very short portions of the drains. The prevailing direction of the wind has no marked influence on the direction and velocity of the air-current in drains. The temperature of the drain-air was, on an average 3·2° to 5·6° C. lower than that in the open air, but the observed air movements in the drains are not explained by this. Where house-drains join street-drains the air goes oftener outwards than inwards, and this partial movement is also independent of the prevailing wind direction. The out and in motion at such places is not constant, but variable. Through these junctions, when near the houses, an exchange of air may occur between one house and another, if efficient water-traps are wanting. The predominant downward air-current appears to be due simply to the current of liquid matter. The experiments are to be repeated in winter, when the temperature in the drains is higher than that in the open air.

AN artesian well is now in course of sinking on Providence-street in Boston, U.S.A. The drilling was begun on March 1, 1880. In eleven months 1,832ft. had been penetrated. The strata bored through are reported to have been as follows:—6ft. gravel filling, 40ft. black mud, 90ft. stiff drab clay, 7ft. gravel, 20ft. clay, 137ft. slate rock. At this depth, 300ft., a stream of water was struck; 700ft. more of slate; 100ft. sand rock to another stream; 200ft. sand rock to another stream. At 1,600ft. a bed of water-worn gravel was met, and the water rose to within about 6ft. of the surface, but fluctuated, sometimes falling to 40ft. At 1,800ft. the water rose from 3 to 20ft. of the surface. A 6ft. stratum of limestone was next encountered, underlying which was granite, through which the drilling was proceeding at the last accounts.

MEETINGS FOR THE ENSUING WEEK.

TUESDAY.—"Greek Sculpture." By Dr. Charles Waldstein. Demonstration to students of King's College in Sculpture Galleries of British Museum. 4 p.m.

WEDNESDAY.—Archæological Institute of London and Middlesex. Annual meeting at the Guildhall, E.C.

THURSDAY.—Society for the Fine Arts. Conversazione.

SATURDAY.—St. Paul's Ecclesiological Society. Afternoon excursion to Rainham and East Ham.

Lamplough's Pyretic Saline is refreshing, most agreeable, and the preventive of FEVERS, BILIOUSNESS, SMALL POX, SKIN DISEASES, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill. *Use no substitute* —[ADVT.]

Holloway's Ointment.—This unguent may be rubbed into the system, so as to reach any internal complaint. By this means it cures sores or ulcers in the throat, stomach, liver, spine, or other parts. It is an infallible remedy for bad legs, bad breasts, contracted or stiff joints, gout, rheumatism, and all skin diseases.

Trade News.

WAGES MOVEMENTS.

INVERARY.—A number of the stone-dressers at Furnace and Crarae Granite Quarries, Lochfyneside, near Inverary, have left work. They demand 10d. on the ton of dressed stone, deducted from them some time ago, but this was refused.

McLACHLAN & SONS, 35, St. James's street, S.W. Builders, Decorators, and House Painters. Designs and Estimates.
General Repairs and Alterations Executed. Experienced Workmen always in readiness, and sent to any part of the country.—[ADVT.]

Doulting Freestone and Ham Hill Stone of best quality. Prices, delivered at any part of the United Kingdom, given on application to
CHARLES TRASK,
Norton-sub-Hamdon, Ilminster, Somerset.
—[ADVT.]

BATH STONE.
BOX GROUND,
THE BEST FOR ALL EXTERNAL USE.
CORSHAM DOWN
CANNOT BE SURPASSED IN BEAUTY OF APPEARANCE FOR INTERIOR WORK.
PICTOR & SONS, BOX, WILTS.
(See trade advt. on p. XXV.) [ADVT.

TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender—it adds to the value of the information.

BERMONDSEY.—For the erection of a drying-shed and workshop, Millstream-road, Dockhead, for Mr. D. McCarthy. Mr. E. Cross, 6, Bermondsey-square, S.E., architect:—

Ayton	£282 12 0
Bullers	280 0 0
Brockwell and Son	249 10 0
Wells, B. (accepted)	239 0 0

BARNBY, NEAR BECCLES.—For erection of Wesleyan Chapel and School. Mr. E. Goff, Lowestoft, architect. Quantities by the architect;—

	Amount allowed for 30,000 bricks.	Full Tender.
Youngs	£45 0 0	£764 10 0
Watson	63 0 0	728 0 0
Kemp	42 0 0	700 0 0
Beckett, G. W.	37 10 0	687 10 0
Brock	57 0 0	687 0 0
Bly	37 10 0	670 0 0
Pipe	37 10 0	668 0 0
Holsworth and Son	48 0 0	649 0 0
Ludkin and Son	48 0 0	618 10 0
Beckett and Mason	—	595 12 0
Lockwood and Cutler	42 0 0	593 0 0
Calver	50 0 0	592 0 0
Hindes	40 0 0	558 18 6
Dunn & Cutler, Beccles*	37 10 0	544 0 0
Cupps and Colby	42 0 0	494 0 0

*Accepted.

BRIGHOUSE, HALIFAX.—For the supply of 20 tons of 4in. gas-pipes, and ten tons each of 3in. gas- and water-pipes, for the local board:—
Bailey, E. and W. H., Bradford (accepted).

BROMLEY.—For alterations and additions to the Grave Maurice public-house, Saint Leonard's-road, Bromley, E. Messrs. Wilson, Son, and Aldwinckle, architects. Quantities supplied;—

Outhwaite	£2,290 0 0
Moyle	2,210 0 0
Bangs	2,165 0 0
Cox	2,130 0 0
Greenwood	2,099 0 0
Hearle	2,093 0 0
Beale	2,049 0 0
Shurmur (accepted)	1,980 0 0

CAMBERWELL.—For rebuilding premises, Nos. 168 and 170, Camberwell-road. Messrs. Isaacs and Florence, architects. Quantities supplied by Mr. L. C. Riddett:—

Conder	£2,285 0 0
Patman and Fotheringham	2,155 0 0
Stimpson and Co.	2,126 0 0
Boyce	1,974 0 0
Tyerman (accepted)	1,935 0 0

CAMBRIDGE.—For painting the Corn Exchange:—

Pleasance, A. W., Willow-walk	£139 0 0
Rooke, H., Willow-walk	91 10 0
Pawlett, J. C., Shelly-row	89 10 0
Greef, L., King's-parade	86 17 0
Leach, M. N., Eden-street	79 10 0
Lever, G., Prospect-row	63 15 0
Flack, G. & Sons, Park-st. (accepted)	44 0 0
Copping, E., Earl-street (no amount).	

CITY OF LONDON.—For the reparation and cleansing of the sewers, for the City Commissioners of Sewers. Mr. W. Haywood, engineer:—

Anderson, W.	at scheduled prices.
Keble	2½ per cent. below.
Stubbs	4 " "
Perry and Co.	10 and 11 " "
Ford and Everett	15 " "
Mowlem and Co. (accepted)	17 " "

COVENTRY.—For the erection of a new coffee tavern in Ford-street, Coventry, for the Coventry Coffee Tavern Company (Limited). Messrs. George and Isaac, Steane, architects:—

Marriott, J., Coventry	£1,747 0 0
Smith, E., Kenilworth	1,625 0 0
Haywood, C., Junr., Coventry	1,400 0 0
Worwood, J., Coventry (accepted)	1,397 0 0

DARLEY DALE, DERBYSHIRE.—For the erection of a pair of semi-detached cottages for Mr. Thos. Holmes. Mr. Jno. Nuttall, architect. Accepted tenders:—
Masonry, &c.:—Wragg, J., Matlock.
Carpenter and Joiner, &c.:—Bowler, T., Darley Dale.

EALING.—For the erection of a house and offices at Hanger-lane, Ealing. Mr. John G. Gibbins, architect, London and Brighton:—

	A	B	C	D	E
Chappell, J. T.	£8,578	£1,180	£9,758	£340	£9,418
Colls and Sons	8,420	1,160	9,580	160	9,420
Patman and Fotheringham	8,590	982	9,572	600	8,972
Adamson, T. H., and Son	7,928	1,046	8,974	289	8,685
Falkner, J. W.	7,950	1,125	9,075	630	8,445
Grover, J. (accepted)	7,527	1,027	8,554	347	8,207

A. Erection of house and office. B. Erection of porch, conservatory, terrace, &c. C. Total. D. Deduction on above if Bath stone is used instead of terra-cotta. E. Alternative total.

FULHAM.—For business premises, for Mr. Asborn. Mr. Banister Fletcher, architect:—

Maxwell Bros.	£1,937 0 0
Allard, A. G.	1,707 6 0
Burman	1,570 0 0
Tyerman	1,537 0 0
Castle, W. H.	1,341 0 0

GUILDFORD.—For alterations and reparations to Mount House, Guildford. Messrs. Peak, Lunn, and Peak, architects:—

	General additions and repairs.	New Bay in front.
Mitchell Bros., Shalford ...	£733 0 0	£150 0 0
Martin, Wells and Co., Aldershot	650 0 0	135 0 0
Pink, Milford (accepted)...	635 0 0	118 0 0
Clark, Guildford	530 0 0	125 0 0
Garnett & Mills, Guildford	527 0 0	122 0 0

GUILDFORD.—For works in the re-making and draining roadways, for the Guildford Urban Sanitary Authority. Mr. H. Peak, surveyor:—

	Cheselden-road.	Hunter-road.	Brodie-road.
Pink, Milford ...	£246 3 0	£195 19 0	£213 12 0
Patrick, Guildford ...	240 19 0	160 0 0	195 10 0
Martin, Wells and Co., Aldershot (accepted)	170 0 0	135 0 0	155 0 0

LONDON.—For redecorating at 32, King-street, Cheapside, for Mr. J. G. Gilbert. Mr. T. P. Ashby, architect:—

Attwood (accepted) £73 0 0

LONDON.—For the erection of offices, St. Swithin's-lane, E.C., for Mr. G. T. Powell. Mr. William Nimble, architect:—

Colls and Sons	£22,882 0 0
King and Co...	22,650 0 0
Laurence	22,474 0 0
Brass	22,185 0 0
Scrivener	21,860 0 0
Ashby and Horner	21,500 0 0
Morter	20,340 0 0

LUDDENDEN FOOT.—For painting the new bridge, for the local board. Messrs. Utley and Gray, Halifax, architects and engineers:—

Wrigley, Hebden-bridge (accepted) £38 10 0

[Two other tenders at £90 and £48 received.]

MATLOCK BANK.—For a house, &c., for Mr. Joseph Crowder Mr. Jno. Nuttall, architect. Accepted tenders:—

Masonry, &c.:—Wall, J., Matlock.
Carpenter and Joiner. &c.;—Statham, Herbert, Matlock.

MATLOCK BRIDGE.—For the erection of house and workshop for Mr. Jas. Thompson. Mr. Jno. Nuttall, Matlock Bridge, architect. Accepted tenders:—

Masonry, &c.:—Askew, W. B., Matlock.
Carpenters, Joiners, &c., work:—Knowles, W., Matlock Bank.

NORTH WOOLWICH.—For the erection of nine shops at Silvertown, for Mr. J. Binder. Mr. R. Peters, Wool Exchange, Coleman-street, E.C., architect:—

Watson and Dennett, Dulwich ...	£3,561 0 0
Parrish, J., Stepney...	3,530 0 0

NORTH WOOLWICH.—For the erection of three cottages at Silvertown, for Mr. J. Binder. Mr. R. Peters, architect:—

Watson and Dennett, Dulwich ...	£745 0 0
Parrish, J., Stepney	600 0 0

PLYMOUTH.—For alterations and additions to No. 26, Portland-square, Plymouth, for Mr. G. R. Barrett. Mr. H. J. Snell, architect:—

Berry, J. P.	£155 0 0
Ham, J.	152 0 0
Palk, W....	123 0 0
Foot, I.	115 0 0
Lethbridge and May (accepted) ...	105 0 0

PLYMOUTH.—For alterations and sanitary improvements to the Plymouth Workhouse, for the Plymouth Board of Guardians. Mr. H. J. Snell, architect:—

Martin, W. N.	£558 0 0
Palk and Partridge	478 0 0
Harley, T.	450 0 0
Stanlake, R.	430 0 0
Lethbridge and May (accepted) ...	409 0 0

REDRUTH.—For clearing the site of the proposed new church. Messrs. J. P. Seddon, Westminster, and J. Hicks, Redruth, architects:—

Thomas, J. (accepted).

SEVENOAKS.—For new brewery and machinery, plant, &c., at Sevenoaks, for Mr. J. S. Bligh. Mr. W. Bradford, 40, King William-street, London, E. C., architect:—

Building:—

Punnett, G. and Sons	£2,776 0 0
Durtnell, R.	2,550 0 0
Willicombe and Oakley	2,550 0 0
Wallis and Clements	2,494 0 0
Wood, J. and Sons	2,398 0 0
Vaughan, E.	2,379 0 0
Naylar, J. G. and Son	2,353 0 0
Callund, T. and Son (accepted) ...	2,260 0 0

Millwright and Engineer:—

Shears and Sons	775 0 0
Pontifex, H. and Son...	712 0 0
Bennett and Sons	700 0 0
Reed and Son	685 0 0
Ramsden and Son	646 0 0
Worssam and Son (accepted) ...	640 0 0

Coppersmith and Pipe Work:—

Pontifex, C. and Sons	694 0 0
Reed and Son	660 0 0
Ramsden and Son	565 15 0
Pontifex, H. and Sons	537 0 0
Shears and Sons	536 0 0
Bennett and Sons	530 0 0
Worssam and Son (accepted) ...	499 0 0

Backwork:—

Shears and Sons	152 0 0
Pontifex, C. and Sons	111 0 0
Pontifex, H. and Sons	105 0 0
Bennett and Sons	103 0 0
Ramsden and Son (accepted) ...	88 14 0

STRATFORD-UPON-AVON.—For erection of chapel, mortuary, custodian's lodge, boundary-wall, &c., at the cemetery for the corporation of Stratford-upon-Avon. Mr. T. T. Allen, Stratford-upon-Avon, architect. Quantities supplied by the architect:—

Jones, D. C. and Co.	£2,154 0 0
Millward	1,995 0 0
Attwood, H.	1,835 0 0
Davis	1,740 0 0
Watson, G.	1,715 0 0
Kennard, E. T.	1,698 0 0
Lissaman, W...	1,675 0 0
Kibler, J.	1,654 0 0
Roberts, J. and Sons	1,600 0 0
Whateley, G.	1,590 0 0
Wilkinson, T.	1,588 0 0
Robbins, W.	1,579 0 0
Compton, J.	1,550 0 0
Tomes, E.	1,530 0 0
Green, W. and Son	1,522 7 0
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THE BUILDING NEWS.

LONDON, FRIDAY, JUNE 24, 1881.

SCALE IN BUILDINGS.

RUSKIN, in his "Seven Lamps of Architecture," observes that "The architect has a peculiar advantage in being able to press close upon the sight such magnitude as he can command." How to make the most of such magnitude does not, however, appear to be a gift with many architects, and we now more particularly refer to "scale" as an element of architectural effect in our towns. Few things are more lost sight of than the relative scale of buildings. We are accustomed to see dwarfish copies of temples and palaces, and on the contrary, Brobdignagian imitations of small features. Of course, every building has an absolute size determined by the object of its erection, by expenditure, or by area of ground. No architect can alter this, so that from such a point of view the scale of buildings is not within the power of the artist. There will always remain the irregularity occasioned by differences of frontage and of elevation; and it is this irregularity which makes the streets of our metropolis so much more varied and picturesque than the boulevards of Paris, where a monotonous regularity prevails. It is the oneness in scale and style which makes Paris the admiration of many visitors who can see grandeur and stately beauty in repetition of parts, long measured vistas, symmetry, and balance of features.

It may be safely affirmed, therefore, that this unconditional or absolute difference in the sizes of buildings is unalterable, even if such general uniformity in the magnitude of buildings were really desirable, as it seems in our English cities where builders like to indulge in their own notions; but we may at least endeavour to lessen the unpleasant differences which sometimes appear between two buildings close or nearly close together. Our remarks refer, therefore, to the comparative sizes of buildings, and it may be shown that although it would be impossible to lay down any definite rules on the matter, it is quite practicable to so regulate the scale and divisions of buildings as to avoid the consequences of their appearing dwarfish or absurdly colossal by the side of others. Diminutive copies of imposing buildings is, even now, a vice among many architects, for we are constantly seeing vestry halls and small provincial banks mimicking the west front of St. Paul's, Sansovino's Library at Venice, or some other equally large structure. Such affectation of magnitude often brings otherwise commendable designs into ridicule, and it must be said this fault of imitating features and proportions only proper in a large edifice, is infinitely worse than the opposite one of affecting largeness of part. The fact is, each of these errors or misapplications of scale may become right or excusable under widely different circumstances, as when, for instance, a single order of columns would be destructive to the significance of the building. The whole question, we must insist, is one bearing entirely on *relation* of one building to another, and the best rule for the designer to adopt is to consult the immediate locality of his intended structure or façade, so as not to do anything so ludicrous as to make the divisions and breaks of his design unnecessarily small by the side of a portico or a building having few large divisions.

It is needless to refer the reader to the want of scale in many great buildings. The figure sculpture and detail in St. Peter's at Rome is so colossal as to rob the interior of the real extent and grandeur of its dimensions; and much of the magnificence of the Arc de l'Etoile is lost by the very greatness and simplicity of the parts, and by the large groups of sculpture which flank the archway, a weakness which has been pointed out by many critics, including Mr. Fergusson. Such a grandly composed edifice as the last not only loses its own dimensions, but turns into a mere bauble the over-elaborate front with which it may be associated, by the striking disproportion in size. It is easy to name the numerous instances of this want of relation between the scale of buildings. Actual difference of character is also largely attributable to scale in the details. Need we compare the refinement and multiplicity of details in the French Renaissance with the largeness and breadth of character in the Italian edifices? The very grandeur and imposing grouping of the Florentine buildings are due to their having been descendants of the feudal fortresses. Again, Ruskin, speaking on this point, eloquently puts it: "A single villa will often mar a whole landscape and dethrone a dynasty of hills, and the Acropolis of Athens, Parthenon and all, has, I believe, been dwarfed into a model by the palace lately built beneath it."

A small copy of a temple looks more ridiculous than the tiny cardboard model under a glass-case in a drawing-room. If there is to be a contrast in size, let it be so extreme and decided that no one will be led into the notion of comparing one thing as a mere copy of another. Glaring inconsistencies in most cases may be avoided by a study of the scale of the adjacent buildings, and even then the architect must take into account the purpose of his own and the next buildings. If a block of business offices is to be built next a church or a theatre, or even a bank, there ought certainly to be less scruple about a difference in the proportions adopted. In such a case the different objects and expression of the buildings should count for something, and it would be utterly wrong to attempt anything like a uniformity of scale in the masses or the detail. A building may often crush another from sheer coarseness of detail as well as size, and it will be found that this effect is in proportion to its nearness. Near a large factory, a finical overornamented front naturally excites ridicule, though numerous instances may be seen in the City and in many of the leading thoroughfares like Queen Victoria-street. It is mere caprice also which would affect largeness of parts for an ordinary shop or house-front by the side of another of usual proportions, and the ideas expressed by the words "largeness" and "littleness" seem to become more apparent when the buildings are close together. The external divisions between stories, and between solids and voids, are the chief adjustable means the architect possesses to insure a due relation in the proportions of his to other buildings. Very many designs are spoilt by the crushing effect of numerous horizontal members, or by the placing of a diminutive order of columns or pilasters close to a larger one; and unpleasing comparisons might be avoided by adopting treatments where orders are sparingly employed, or altogether omitted, so that unnecessary comparisons may not be suggested. Apparent scale is sometimes obtained by a crowded fenestration, but true nobility of elevation cannot be secured by such means. Architects might well take for models such fronts as the Strand and River façades of Somerset House. Over-elaboration is a tendency nowadays rather favourable to smallness of features, and while, as we have hinted, it is more common than attempting an imposingly large treatment, it is also less satisfactory as leading to an insignificant style. The internal divisions of structure, of course, will always suggest to the true architect the external treatment, and, as a general rule, may be taken as the measure of the parts. Buildings of only two stories, and generally all public edifices, require necessarily a bolder scale than buildings of several stories, and the greater the area or frontage covered the larger the principal divisions may be made. We might well enlarge upon this topic in detail; in conclusion we simply make another reference to an already quoted authority: "If the architect choose size, let him abandon decoration; a yard more across the nave will be worth more to him than a tesselated pavement; and another fathom of outer wall than an army of pinnacles."

THE RIGHT TO LATERAL SUPPORT.

THE right to lateral support from the adjoining soil has at last been laid down and legally defined by the highest court in the country. After a long course of litigation the well-known case of Angus v. The Commissioners of Public Works has been decided by the House of Lords in the plaintiff's favour. Upon no other question, perhaps, has there been of late years so great a division of opinion amongst the most eminent lawyers. The case was tried in the summer of 1876 before Mr. Justice Lush, who ruled that there was a legal right to such lateral support; but this was reversed by Chief Justice Cockburn and Justice Mellor, while their decision was set aside by a majority of the Court of Appeal. So important was the principle involved, that the House of Lords consulted with the judges who recently gave their opinions, and in which they seemed to be almost equally divided. But now, by the judgment of the Lord Chancellor, this question is set at rest, and the easement of support has been legally recognised and explained. It must, however, be admitted that there still remain some practical points upon which doubts and difficulties are likely to arise in the future. Seeing the very complex character of the rights themselves, and the complicated state of facts upon which they may often depend; it is impossible that one case should settle everything. But this decision does a great deal in the way of solving a very puzzling problem, and, as it affects all who have to do with house-property and with building, its result and consequences need to be carefully considered.

The material facts upon which the case turned are such as may happen any day to anyone concerned in rebuilding upon an old site. Messrs. Angus and Co. are coach-builders, of Newcastle-on-Tyne, and in the year 1849—which, it will be observed, was more than the 20 years ago when this action commenced—they converted an old dwelling-house into a coach-factory and warehouse. In doing this, they took out the internal walls, and erected upon their own soil, but close to and adjoining the neighbouring house, a large stack of brickwork, which served both as a chimney-stack and as a support to the main girders, which were fixed also into their own opposite wall, and carried the floors of the factory. This large new stack of brickwork was, of course, far heavier than the old wall it succeeded, and so required more lateral support from the adjoining soil. But it must be taken to be good law that the owner may build as he choses upon his own land, and so that Messrs. Angus were entitled to erect this stack of brickwork although it pressed more heavily upon the adjoining soil. Yet, as they had no grant to do this from the owner of the adjacent land, their claim to receive lateral support from his soil could only be based upon prescription, or upon uninterrupted enjoyment

for over twenty years. This was the foundation of their case, for from 1849 down to about 1874, there had been no attempt at interfering with this enjoyment. At that time, however, the Commissioners purchased the adjoining premises, and forthwith proceeded to pull down the old house, intending to erect a public office on the site. For this purpose they employed Mr. Dalton as their contractor, and he, in the course of the work, excavated the ground adjoining the plaintiff's factory, leaving a thick pillar of clay around the new stack of brickwork, and also shoring up as usual. Notwithstanding this, however, the ground beneath the plaintiff's stack gave way, for want of lateral support, and their building fell down. At the trial a verdict was given for the plaintiffs, with £1,943 by way of damages; and that verdict has now at length been affirmed by the House of Lords.

These facts are common enough in this age of re-building, and are such as cannot fail to come before every architect and builder in the course of an average business. It must first be observed that the plaintiff sued both the owners and the contractor, and that both sought to get rid of their liability. The commissioners alleging that Dalton alone was liable as their contractor, while he tried to throw the responsibility upon his sub-contractors. But these contentions wholly failed, as the House of Lords affirmed the ruling of the Court below, and held that both the commissioners and their contractors were equally liable. This they did upon the well-known and recent case of Bower v. Peate (Law Rep. 1, 2, B Div. 321) which was decided in 1876. In that case it was held that a house-owner who orders work to be done, from which, in the natural course of things, injurious consequences to his neighbour must be expected to arise unless means are adopted by which these may be prevented, is responsible for such consequences even if he has intrusted the work to a contractor, and even if he has used the necessary precautions in engaging such contractor. It follows from this, that if an adjoining house ought to have been underpinned, and from an omission to do so by the contractors, it was injured, the house-owner who employed the contractor is also liable for the damages. Passing lightly over this point, the Lord Chancellor said the questions arising upon the appeal were really two. First, whether a right to lateral support from adjoining land can be acquired by over twenty years' uninterrupted enjoyment for a building proved to have been newly erected at the commencement of that time. Secondly, whether, if so, there was anything in the facts of this case sufficient either to disprove the acquisition of such right, or to make it dependent upon some question of evidence which ought to have been submitted to the jury.

We do not propose to follow Lord Selborne through his learned and laborious judgment; but to get at all a clear idea of the point at issue, it must be borne in mind that the right in question is an easement, and, therefore, that it is not a natural right, but one purely conventional, and which must be based either upon an actual grant or upon prescription. As was said by that very able and acute judge, Mr. Justice Willis, in the leading case of Bonomi *v.* Backhouse (Ellis Bl. and Ellis, 655), "The right to support of land and the right to support of buildings stand upon different footings as to the mode of acquiring them; the former being *primâ facie* a right of property, analogous to the flow of a natural river or of air; while the latter must be founded upon prescription or grant, express or implied; but the character of the rights when acquired is, in each case, the same." Thus, then, before an owner can acquire a right to lateral support for his building from the soil of an adjoining owner, something must have been done or happened. If that adjoining owner has given his neighbour leave to build as high as he choses, and of what weight he likes, then the right to lateral support has been granted, and there is an end of the matter. But where nothing is said or done by either party, the question arises, when and how does the claim made by the owner building or rebuilding to a lateral support from the soil of the adjoining owner ripen into a right? The answer to this question is now given by the House of Lords, and is, putting it shortly, "after over twenty years' uninterrupted possession." As soon as this lateral support from the adjoining soil has been enjoyed for more than twenty years without interruption; then the land adjacent becomes affected by the lateral weight as an easement or servitude; and the adjoining owner is placed legally in the same position as if he had from the first granted the right of support to his neighbour's buildings. When, therefore, twenty years had passed since Messrs. Angus altered their old dwelling-house into a new factory, they had, by virtue of this period of enjoyment, acquired the same right to lateral support from the adjoining land as if its then owner had granted them that right by deed and with all due formalities; but this would not have happened had the adjoining owner done anything to prevent this enjoyment by taking such steps as might have been necessary upon his own land.

But here we come to the real knot of the question, the very *crux* of the case. For, how is it practically possible for such an adjoining owner to prevent this enjoyment from running on into a right? He can hardly be expected to dig up the foundations of his own house, so as, by the excavation, to dispute the claim which is actually made by his neighbour to lateral or increased lateral support. Yet, in no other way, can the acquisition of this right be disputed; for, merely to protest would be useless. This point was pressed upon all the Courts in argument, and was, in fact, the main reason why the Queen's Bench Division decided against the plaintiff, holding that it was practically impossible for the servient owner to prevent the easement from becoming complete. But the Lord Chancellor disposed of this question by laying it down that "The policy and purpose of the law, on which both prescription and the presumptions which have supplied its place when length of possession has been less than immemorial rest, would be defeated or rendered very insecure, if exceptions to it were admitted on such grounds as that a particular servitude (capable of a lawful origin) is negative rather than positive; or that the inchoate enjoyment of it before it has matured into a right, is not an actionable wrong—or that resistance to, or interruption of, it may not be conveniently practicable." But, though this must now be taken as the law, it may easily put people in a very serious dilemma. Supposing the owner of one of two old houses to pull it down and rebuild an edifice twice as high and more than twice as heavy, what course should be taken by his neighbour? If he does nothing, then time will run on. At the end of twenty years the right to lateral support from his soil will be acquired for the new building, and he will hold his land subject to this burdensome easement or servitude. Should he also wish to pull down and rebuild, then he will be put to great expense in the way of underpinning and the like; and should anything happen to the adjoining building, he will now be liable to make compensation. In other easements this difficulty does not arise. It is true the owner of a building may open as many lights as he chooses over his neighbour's land. But should that neighbour object to their becoming ancient lights he can erect a hoarding upon his own land, and so shut them up effectually or compel him to come to terms and enter into an agreement by which the right will be stopped from becoming complete; so also with a claim to a right of way. Obviously, with regard to lateral support there is no such simple method possible. Yet the House of Lords have held that the law is the same as to both classes of easements, although practically there is so serious a difference. Of course no one can secretly acquire a right, and thus, if the old building in this case had been altered internally, so as to require more lateral support, but in such away that the change could not be easily discovered, then the plaintiffs would have failed to make good their claim. But as to this the Lord Chancellor held that an alteration of a main wall was a thing that the adjoining owner could not help seeing, and that it was in effect, a notice to him that an extension of lateral support was being acquired, and that it should put him upon inquiry, and lead him to take such steps as might be necessary to stop the right accruing.

But though this last case has laid down an important principle, it still leaves open a point of even higher importance. The Lord Chancellor assumed that the owner of land had a right to build thereon as he chose, and, as a consequence, that the adjoining owner could not legally object to the additional servitude which was thus being imposed upon him in the way of lateral support. He held, in short, that this building or rebuilding would not be an actionable wrong for which the adjoining owner could sue and recover damages. Yet it is clear that this point is by no means certain, and that it still remains to be decided. If the Courts held that an owner had a right of action against his neighbour for imposing a heavier burden upon his soil, this would be quite in accord with the Lord Chancellor's view as to the policy and purpose of our law, while it would also put the parties in a fairer position than they are at present. Although the Lords will not allow the fact that it is, to say the least of it, very inconvenient for an adjoining owner to prevent the ripening of this right to lateral support, by pulling down his own premises and digging up his own foundations, to interfere with the theory of the law; still, the existence of this awkward fact must be admitted, and cannot be denied. How it will go with anyone who may be bold enough, in the future, to raise this point we cannot guess; but we are sure that the making it an actionable wrong is the only way to reconcile the claim to lateral support with common sense and common justice. Apart from this question, however, the existing law shows that the owners of house-property have to face a new danger, and that it behoves all who propose to build or to rebuild, to make careful inquiries before purchasing as to what rights have been acquired in the way of lateral support by the adjoining owners.

THE WATER QUESTION.—X.

IN view of the storage of water in any river-basin at heights which command the places where it would be used, whether for domestic purposes or for power, it is to be observed that if the owner of uplands or midlands is called upon to contribute to the diminution of floods in the lower lands, and, instead of a money contribution, prefers to store and regulate the flow of water from his land, there are two respects in which the storage and regulation are to be regarded. In the one the works to be constructed would be such only as to protect the land from taxation; in the other they would, in addition to this, be effective for

the supply of water for domestic and other purposesin the usual way, with a little difference of construction. It is the object of all reservoirs to store flood-waters, whether for the supply of towns directly from them or for compensation to mills, and the stream itself for the diversion of springs for that purpose. The finest water for the supply of towns is spring water arising in the upper parts of river basins. Springs may be divided into two classes, great and minor; the former arise from fissures and faults in the stratification of the ground, chiefly the limestones, including the chalk and oolite, and from the new red sandstone and millstone grit formations, and many of this class of springs issue at the rate of a million gallons a day or more. Minor springs issue in innumerable places in the upper and upper-middle parts of valleys where the ground largely consists of sandstone, being thrown out by underlying impermeable ground, such as the shale of the coal measures, and when these are collected by conduits they form large volumes of water. But as springs belong to the streams and rivers in dry weather, and to the immediate use of the occupiers of the valley lands, they cannot, without compensation, be diverted for the supply of a distant town, or indeed for any purpose whatever. In such cases, where it is desired to take them out of the valley, or to a town within it, it is necessary to make reservoirs to store the flood-waters and give them out day by day in quantity sufficient to compensate the people affected by the abstraction of the springs; these are millowners and all owners of riparian lands. It has been usual, when a water company, or a corporation, or a local sanitary authority, has applied to Parliament for powers to make works whereby water would be taken from a river or stream, to secure to the river interests about one-third of the available quantity of water to be derived from the area intended to be appropriated. In many cases, one-third of the average available quantity of a long series of years has been asked for and obtained, on the understanding that the average available quantity could be dealt with by means of storage reservoirs, two-thirds going to the town. It has been the millowners who have taken the lead in these demands, and most strongly opposed Bills in Parliament; but as the interests of the riparian landowners have been on the same side of the question, they have usually gone with them and strengthened the opposition, and together they have so far convinced Parliamentary Committees of the justice of their claims, as to force the admission of clauses to the effect mentioned: and, sometimes, so much water has been conceded to these demands, that it could not be given in years of less than the usual rainfall, consistently with a due supply to the people by whom the undertaking was promoted, and money compensation has had to be resorted to instead, at least, for a time. What rule, if any, was adopted by the old millwrights in giving dimensions to water-wheels on streams of certain powers, we do not know; but, when all the water-wheels and sluices on a stream have been measured, and the quantity they are capable of using has been calculated, and an average struck, the quantity is found to be about one-third of the average quantity of water coming down the stream at the sites of the various mills; probably rather less, and especially so where in the first construction of the mill no auxiliary power has been contemplated; for, since steam-engines have been used to drive water-mills in dry weather, the wheels have sometimes been made capable of using a much greater proportion of the water; but without such auxiliary power, a wheel too large works at a disadvantage on the average of the year; and this, at least, the millwrights knew. Engineers have a feeling of respect for the old millwrights, as having been the fathers of the profession in all that relates to water and waterworks. Some of the new engineers, indeed, to whom and with whom iron is everything, the material with which anything can be done, and without which nothing—the *sine quâ non* of all constructed works — know not these men or their merits; but to others there is a peculiar charm in the contemplation of their works. Their works are, many of them, eminently unscientific; they are works of art; and if some of them are clumsy machines their defects of construction have served to point a better way to later engineers. But when the late Sir William Fairbairn began to make wheels of better construction, these old works of art were looked upon with more amusement than admiration, and were, many of them, supplanted by wheels which, besides having proper air-escapes, ran lighter and with more effect with the same expenditure of water, and were, moreover, so made as to admit of various quantities of water being used on the same wheel with equal useful effect; and wheels of this sort form no guide to the quantity of water which is properly due to the stream in dry weather, for some of these wheels can actually use more than the average annual volume of water. But since so many circumstances of water-mills, in respect of the quantity required to drive the machinery, have been brought forward in such cases as those above referred to, the usage of Parliamentary committees, in giving certain proportionate quantities of the water available to the mill-owners and riparian landowners, has come to be almost a precedent necessarily to be followed. One-third in some cases, perhaps in most, and two-fifths in at least one other case, are the proportionate quantities which have been given to the mills of the available rainfall derived from areas in the upper parts of river basins, and with reservoirs as usually constructed in respect of size, the stream receives in addition in floods about one-sixth of all the water that comes down, for it cannot be stored with due observance of economy.

Where, however, the object is to prevent excessive floods passing too suddenly down the valley, as well as to store water for use day by day, the reservoirs will have to be differently constructed. The means to be adopted must vary with the character of the ground and form of the surface; the various geological formations have distinctive features in this respect; in one there are favourable sites for reservoirs which can be formed by an earthen embankment from one hill-side to the opposite one, where clay is abundant, or where rough stone and shale predominate and clay is in sufficient quantity; in another river-basin the surface descends to the valley almost in one unbroken slope, and where absolutely no sites exist for the formation of such reservoirs as these; and in another case the form of the ground may make a partial adoption of each of two methods advisable.

From the examples of excessive rainfalls previously given, it may well be inferred that such great quantities of water falling so suddenly cannot be stored without some difficulty, and this is confirmed by the fact that ordinarily, that is to say, in storage reservoirs constructed for the supply of towns, including those for mill purposes, about one-seventh or one-sixth of the whole quantity of water running off the ground passes the reservoirs in floods; that the reservoirs are full, when these excessive rainfalls take place, to such a degree and so often that about that quantity of water cannot be stored in those reservoirs. The capacity which is given to a reservoir is based upon the number of days during which it may be estimated that there will be no rainfall, and upon the difference between the available portion of the rainfall and the daily supply to be given out of the reservoir. If all the rain falling in any given time, say in a year, were to fall at once, and once every year, the reservoir would have to be made large enough to contain 365 days' supply; and if, on the other hand, it were to fall every day in quantity equal to one three hundred and sixty-fifth part of the year's rainfall, no reservoir would be required. It depends upon the frequency of the rainfall and upon the quantity falling at various times, what the capacity of the reservoir should be, for the less frequent and the greater the yearly rainfall, the greater capacity is required, while the more frequent and the less the yearly amount, the less quantity need the reservoir contain in order to give out the daily supply.

From the quantity resulting from the rainfall is to be deducted (1) that which is evaporated before it can be discharged from the reservoir, (2) that which sinks into the ground above the reservoir and issues below it, and (3) that which enters into the growth of vegetation. No one of these can be ascertained separately, but the three together constitute a loss which is ascertained by gauging the streams as well as the rainfall, and, practically, it is the whole loss only which concerns the question; the actual quantity of each is of scientific interest but not of practical moment in the water question; at least not at present. There is a fourth source of loss, in reservoirs as usually made for the supply of towns and for mills—viz., excessive falls of rain taking place when the reservoirs are full, and which, as has been said, amounts to something like a seventh or a sixth of the quantity which would otherwise be available. This is a loss which need not necessarily be incurred, like the other loss, but is suffered by water companies and other proprietors of waterworks solely on economical grounds; it does not pay to make a reservoir so large as to store all the water which would be available if the average of years were the basis of calculation; it is reckoned that for the purposes of water supply to towns, and for compensation to mills, it is economical to store only the due proportion of the available quantity during a short series of three or four years of least rainfall. But we are not now upon the question of storage for town supplies only, or for mill purposes only; the question here is that of preventing the overflow of rivers, combined with such means of storage as will make that object attainable with economy through a revenue to be derived from supplying water for domestic and other purposes, and for power. Now, in the usual way, the water is husbanded, as it were, to the utmost, and only so much given out day by day as the demand calls for; but in the other case the aim is a little different: it is to regulate rather than to absolutely store up the flow of water at the site of the reservoir, and whereas it is the aim in the one case to keep a full reservoir, or at least to have as much water in stock as possible, in the other it is to keep down the water to such a point as will leave only a sufficient quantity in the reservoir to meet the requirements of the necessary economy to be observed. The water to be supplied will be chiefly to villages and small towns, and to single houses near the line of conduit-pipe; to manufacturers for power and for other commercial purposes, and to intermediate lands for irrigation. In some valleys, or in some parts of the largest valleys, no water may be required for these purposes, and in those cases the work to be done will be such only as is necessary for regulating the flow of water; but in other cases a combination of storage and regulation will be the proper plan.

AID BOOK TO ENGINEERING ENTERPRISE.*

MR. EWING MATHESON, M.Inst.C.E., has brought out a second part of his valuable Aid Book, published in 1878. That book treated of the inception of public works and of the conditions on which success depends. The present part deals with the different modes of contracting, and enters into various particulars relating to the design or choice of machinery and material with a view to affording aid to foreign or colonial transactions. It would be impossible to give the reader anything but a very general idea of a book of nearly 500 closely printed pages, though a glance at a few chapters and the numerous marginal headings, interspersed here and there with engravings, will enable him to form a notion of the thorough manner in which Mr. Matheson has performed his task. The leading chapter on contract and purchase in the engineering trades is one of the most useful in the book. Speaking of prices and the value of preliminary agreements, the author show how competitive prices ought to be based. The conditions must be the same in all cases, or the purchaser ought to be aware of the differences and have some standard by which to judge. Bargains are divided by the author into three parts—1, agreement or contract to sell and buy; 2, technical conditions implied by specifications furnished by both the parties, samples, repute, or trade-mark; and 3, measure of price. In this country, as the author remarks, a large proportion of contracts are made by letters only, one letter offering to sell or carry out certain works for a specified sum, and a return letter accepting such offer; whereas elaborate documents would hinder commercial transactions if made compulsory in every small business. A protracted correspondence, however, is not so desirable a means of making a contract; and when the transactions are of a similar kind, formal documents which embody clauses suggested by experience are desirable. Some useful observations are made respecting verbal qualifications, agreements, specification furnished by buyers, risks imposed on sellers. A very important caution is given, for example, to manufacturers not to undertake too much. An engineer may, for instance, design a bridge and may make the manufacturer responsible not only for following the drawings and supplying the prescribed materials and sizes but for the effective strength of the bridge; stipulations are often inserted in specifications that the bridge shall be capable of standing a certain test with a stated deflection. A manufacturer may unwarily accept such responsibility which really should rest on the designer, and as Mr. Matheson fairly puts it, it is not expedient that the manufacturer should make himself liable in the twofold capacity of manufacturer and engineer. In such cases, it is necessary the manufacturer be on his guard, and not accept the liability without verifying the designers' calculations, as, by neglecting to do so, he becomes liable for any failure which may arise, not through defect of manufacture, but imperfect design. A very fruitful source of dispute and evasion may arise when a buyer specifies details of workmanship or methods of which he is not thoroughly conversant. It is much better, as the author says, "to describe as clearly as possible the ultimate object in view, and in general terms, the quality that is desired, thus putting upon the contractor the responsibility of doing what is evidently demanded. The force of general terms is weakened by adding detailed instructions, unless the latter are very complete." In preparing specifications or particulars of things required, and in arranging contracts or bargains, very useful hints may be afforded by the Aid book. The advantages, for instance, of "bills of quantities" of materials and workmanship accepted by buyer and seller alike as a basis of contract, is pointed out. Contracts based on specification of the seller are a mode of business desirable only when the commodity sold is a speciality of the seller, or of which he is independent of outside skill or design, and this method prevails more in the United States, where designs of bridges and buildings are often undertaken by the manufacturer, or engineer-contractor as he may be called. Trade catalogues—their advantages and abuses—are pointed out with much force, and the reader is put on his guard against making choice of goods from handsomely got up and engraved catalogues. Purchases based on sample, or on specification and sample combined, are discussed, as anything like iron or cement requiring a test may be best indicated by samples. In railway contracts samples are often made the bases of the undertaking. Trade-marks and their abuse, modes of payment, risks, schedules or schedule rates, and the best methods of making them, arbitration, and other matters of a business nature are treated on.

Purchase for Export, the Establishment of Factories, the Transmission of Power, are titles of other chapters of the book. In the last, steam, water, compressed-air, connecting rods, shafting, &c., are considered, and the engineer or contractor will find the marginal headings numerous enough to assist him in making up his mind on almost any point as to the advantages to be derived from one or the other method; the cross-references and diagrams also are of considerable value. The remarks on hydraulic pressure, Armstrong's accumulator, and the proposal to adopt this and the Swiss plan of conducting high-pressure water through the streets for sale as power are interesting and full of useful data. Air compressors, rock-drills, and many recent methods and motors are described, which the contractor or engineer will find convenient for reference. Coal, iron, and steel, are also the subjects of another valuable chapter. Thus we have the various classes and subdivisions of rolled iron described, such as L and T bars and joists, and the competing ironworks in Germany, France, and Belgium are noticed. Much useful technical information will be found in this part on prices, tensile strength, and other tests into which it would be tedious and unnecessary to enter here, and the marginal headings give the text all the convenience and facilities of a dictionary. Fallacious brands are pointed out, and the dimensions of rolled bars of the usual sections for roofs and joists are given. It may be as well to remind the reader that L-bars are of more uniform quality and strength than T-bars, as the rolling is more favourable. Steel is also discussed in detail.

Many architects, purchasers, and contractors will find Mr. Matheson's work also an aid to them in selecting steam-engines for various uses, as the varieties are classified, and the advantages of the different kinds pointed out. The chief considerations, for instance, in selecting an engine or boiler, such as space, power, weight, fixing, fuel, and cost are enumerated, and the technical terms explained; so that an architect can have no difficulty in specifying exactly what he requires, and in using the proper terms, such, for instance, as the "nominal horse-power" required, the kind of boiler, &c. In the same way, the chapter on pumping-engines furnishes a fund of useful information and details, and the remarks on tanks, and the best methods of constructing and stiffening them; the details of flange-joints, and cement-linings; cast-iron tanks and their liability to fracture by changes of temperature; cost of tanks and capacity will be found of much use for reference. Iron pipes and the various socket, flange, and other joints are detailed, and the designer as well as contractor will find to his hand a valuable repository of technical facts.

Passing a chapter on railway equipment, we come to a useful one on machine tools, forming a complete handbook on this extensive branch of engineering. Cranes—steam, hand, and hydraulic—are classified, illustrated, and described, according to their use and value in construction, and the contractor will find much to interest him in this part; as also in the next on excavating machines, boring tools, rock-drills, pile-drivers, &c., about which occasional information may be needed. These various appliances are amply illustrated by small engravings in the margin, sufficient to give the contractor a fair idea of the construction. Thus the boring tools in use for proving foundations, worm augers, chisel-drills, rock-drills are illustrated, and every point about which a contractor or engineer may need to be informed is briefly explained.

The concluding chapters on Portland cement, iron roofs, buildings, and light-houses concern the architect and builder particularly, but we have no space to enter into these sections. The strength and qualities of cement, methods of manufacturing it, the modes of testing by briquettes, tests by weight and fineness, and the usual specification qualities, mixture with sand, price and other items of permanent value for reference are given. Every variety of iron roof, modes of lighting and construction, the values of galvanised iron, zinc, copper, or other covering materials will be found illustrated by diagrams and their merits discussed, while fireproof buildings, and the conditions best to insure resistance to heat, are not overlooked. We may have something more to say on these chapters; a detailed review of the work, however, is not necessary to convince us of the thoroughness and value of Mr. Matheson's Aid Book for the contractor, engineer and architect, as it embodies every kind of information most likely to be required in contract work abroad, or, indeed, at home.

* Aid Book to Engineering Enterprise Abroad. By EWING MATHESON, M.Inst.C.E. London: E. and F. N. Spon, Charing-Cross.

WINDSOR TAPESTRIES AND CARVED WOODWORK.

AT the Bassano Galleries in Old Bond-street, an exhibition of some very choice Windsor tapestries and woodwork is on view. These have been arranged in a very complete and artistic manner on the staircase and four rooms, so as to present to the eye somewhat of the finished effects the tapestries would have when placed in their proper places with the accompaniments of furniture. Mr. H. Henry, the director, has arranged these woven fabrics to represent the distinct treatments of tapestry design and execution, and in so doing, has rendered a service to the art-student. The panels of painted reps imitating tapestries, on the staircase, are thoroughly decorative in treatment; they represent figures against dark grounds of green foliage. "La Chatelaine" is particularly effective. In the first room we come to we notice a panel of Windsor tapestry (one of a set) manufactured for and lent by Mr. Christopher Sykes, M.P. The subject is from a design of the late E. M. Ward, R.A., entitled "The Death of the Stag," in which the figures of huntsman and his lady and the accessories are worked with great truthfulness, and the colouring and shading of the figures are in good harmony. There is a bold folial border. The painted cartoons exhibited, one of them by E. M.

Ward, R.A., and the other by T. W. Hay, are interesting; we also notice a carved walnut seat in the French Renaissance style, lent by Gillow and Co., recently noticed by us in our account of the Albert Hall Exhibition.

In another room, the fine tapestries with figure-subjects representing scenes from Tennyson's "Idylls of the King," in which King Arthur is the leading character, are particularly fine examples both in style and colouring of what may be called the modern English school, in which feeling and ideal drawing approaching the Burne-Jonesian in conception are carried out. These panels are from cartoons by Herbert A. Bone, and the compositions are clever, while the tints are delicate, well blended, and flatly treated in a decorative key. The other tapestries, representing the "Arrival at Camelot of the dead body of Elaine," "The Castle of Astolat," and the "Nun and Sir Galahad," are executed in the same style, and will well repay attention. Below the latter panel is a carved walnut dado designed in a massive Elizabethan or Italian style, with Ionic half-pillars standing on trusses, a bold cornice, and panelled in the die. This and some other carved Italian furniture have been lent by Messrs. Gillow and Co., and much assist the *ensemble*. We also notice a clever water-colour drawing of "Dining-room Decoration," designed by Mr. H. Henry, exhibited at the Paris Exhibition, lent by the same firm, and which was illustrated by us at the time. A small room in the collection is finished to represent the Louis XVI. style of decoration. Of the tapestries we note a charmingly-woven picture of "Windsor Castle from the Thames," from a cartoon by John O'Connor, lent by Mr. Henry F. Makins, and some fine silk and wool tapestry panels of a decorative character. One of these, representing a figure of a maiden personifying "Spring," from a cartoon by M. Gerard, Paris, for Sir Albert Sassoon, K.C.S.I., is a beautifully finished panel. The flowers in the lap of the damsel, the cupid-like figures in the clouds and background, and the border, are wonderfully well done. One or two of the smaller panels, Nos. 4 and 5, in walnut frames, are exceedingly spirited in design and colouring. They are made from sketches by the Marchioness of Waterford, and represent the four seasons. The figures in the central ovals are enlarged by Mrs. E. M. Ward, and the borders are in the Italian Renaissance; but the chief attractions in this unique apartment will doubtless be the very handsome arm-chairs exhibited, in the Louis XVI. style, with gilt frames, covered in very fine Windsor tapestry. These chairs have been made to order for the Duke of Westminster, K.G., from designs by Ch. Monblond. The design of the tapestry seats and backs is chiefly composed of Renaissance ornamentation, flowers, and wreaths, with borders worked in delicate colours on light grey and green ground. They have all been made at Windsor. Messrs. Gillow and Co. contribute a very cleverly-carved walnut Italian pilaster, the panel of which is carved in pear-tree wood, with a capital of a composite order, and with broken entablature. We also notice a silk screen of very elegant design, and exceedingly delicate in the colours.

The largest and last room of the suite is decorated with some very large panels of Windsor tapestry, made for Mr. Henry A. Brassey, M.P. The subjects are chiefly battle-scenes. One represents the Battle of Aylesford, in which Vortigern, the British king, attacked the Saxons, the episode being taken from Halstead's History of Kent. The composition is from a cartoon by E. M. Ward, R.A. Other panels, from designs by J. E. Hodgson, R.A., represent "The Men of Kent Marching in front of Harold's Army"; "The Siege of Rochester Castle by Simon de Montfort," "The Burning of Rochester Bridge." These large tapestries have bold borders. The figures are life-size, and shaded, and the subjects are pictorially treated in the Italian style in a bright key of colour, which will be considerably subdued in the hall in which they are designed to be placed. In this room may be observed two richly inlaid Italian cabinets, the inlays being on ebony, lent by Messrs. Gillow, one a replica of the other. The Louis XIII. chairs, in crimson velvet, and the walnut pedestals, with delicately-carved panels in low relief, are a few of the other adjuncts in this splendidly-decorated room.

SHOP-FRONTS.

ARCHITECTS, art-designers, and builders, have, to a great extent, ignored the shop-front, as though it were some poor relation of street architecture proper.

The shop-front, as we now understand it, is essentially a modern institution. A couple of generations ago it probably had no existence, and the old shop-front of our boyish days is so rapidly becoming a thing of the past, that we can hardly point to a remaining example of it. The most typical that occur to us for the moment are those of Mills, of Bond-street, and Bell in Oxford-street. In the latter a portion of the front wall has been cut away from the ceiling to within some 3ft. of the ground, but leaving sufficient at each side to form two solid piers. These carry a stout and plainly visible brestsummer, which bears the superincumbent structure. The entrance-door remains in the centre, and the openings are fitted with modern framework, resting on light iron railings, and capped by a moulded entablature with a plain frieze for the name. The windows thus formed are slightly curved outwards to obtain additional light and attract attention, and are glazed with the small squares familiar to our forefathers; and the whole front has a quiet and pleasing effect, specially its own.

There are some others that we cannot forbear mentioning. There exist a good many in various parts of Soho, which are all more or less quaint and characteristic; and Dean-street, besides rejoicing in several of the best, is still the happy possessor of one which, small and dilapidated as it is, and devoted to nothing more spirit-stirring than bull's-eyes, starch, and bags of flour, is still an excellent example of fine, though antiquated, treatment. It is directly opposite the St. Anne's Vestry, and its Ionic pilasters, enriched entablature, and the doorway, with its pediment and carved architraves, approached by a short flight of steps, are well worth a visit from those who take an interest in the few remaining nooks and crevices of old London.

On the west side of Adam-street, Adelphi, is a remarkably fine old double shop-front, belonging to Attenborough, somewhat of the first-named type, but enriched with all the combined vigour and delicacy of the "Adams" ornamentation. In the Strand, almost opposite the little theatre that bears that name, is a small, quaint, old-fashioned little front, that has, apparently, been restored in consequence of dilapidation, and slightly modernised. Whatever may actually have been done, it has been effected with the best judgment; for nothing could now be more suitable for the "Express Country Milk Co." Lastly, we journey to Cornhill, in order to express a pious hope that so long as we can appreciate a luncheon of turtle and milk punch, and our country cousins retain their wonderful appetites for cream-tarts, so long may Birch's shop-front be spared from the destroying and unhallowed hands "of the ruthless invader and foe."

Now, if we turn to the *modern* shop-front, what do we find? Consecutive miles of plate-glass—the huge sheets varying in size according to the purse, the parsimony, or the prodigality of the tradesman; but inevitably glazed within the narrowest possible strips of brass, iron, or wood, which look like umbrella-ribs, or whalebone, and are frequently invisible to the naked eye from the opposite pavement. Every sign or notion of structural support is indefatigably burked; the party-wall is disputed to the last inch by this crystal demon; the piers, iron stanchions, or columns (which, of course, exist somewhere or other to sustain the building), are incased in looking-glass, converted into sham show-cases, or concealed in some other equally ingenious way; so that the vast masses of brick-and-mortar above them become literally and truly "the baseless fabric of a vision." Then these dreary wastes of glass are nearly always skirted with that nondescript article, the "brass-plate," containing the name and business of the tradesman, and surmounted by the same information, conveyed in a still more objectionable form, upon the garish, vulgar, glass facias, which do more, perhaps, than anything else to make our best streets hideous. We are, of course, now speaking of shop-fronts proper, constructed specially for the exhibition of goods. The windows of the wholesale firms, where little or no display is required, are not open to these strictures; nor are the fronts of many business houses, whose transactions either are, or assume to be, of a sufficiently professional nature to render anything unnecessary beyond a large plate-glass window to admit abundant light, and at the same time to mark the commercial character of the establishment. Many of these are excellent in their treatment, and some of the newly-erected banks are models of what such buildings should be. It is sad that we should have to descend to the gin-palace to class it with banks and high-class business houses; but the fact remains that the average London publichouse-front is constructed upon an excellent though stereotyped model. Disfigured as it may be, and usually is, by wretched architecture, vulgar ornament, and tawdry gewgaws, the accepted and almost universal type is thoroughly sound in principle. The house may have two doors, or it may have many, according to its size and situation; but the doors are at moderate intervals, and alternate with the windows, the sills of which are usually some four feet from the ground. Each door and window is separated by a bona-fide column, pilaster, pier, or stout door-post, which unmistakably supports the entablature, and gives to the whole front an air of stability that might well be emulated for better purposes.

Should any of our readers think that we are either romancing or exaggerating, we would beg them to take a stroll—or the front seat on an omnibus—say from the top of Bond-street to the Bank, and we should then like to ask them whether they can gainsay what we have stated, with a few exceptions, to some of which we shall presently allude.

Gaze at that monstrous building of Jacobson's, where a heavy cornice, some sixty feet long, with three floors above it, is supported (?) on two stories of plate-glass, the squares of which are apparently divided in the lower by knitting-needles, and the upper by cedar pencils!

Look at the half-dozen houses or so that are comprised in Peter Robinson's huge premises, and see if you can find six inches of apparent structural support throughout the whole front! Or watch the progress of the hideous shops now in course of completion immediately east of the Princess's Theatre. There is no need to multiply examples, but will take one more—that of Duclas, the French "Confiseur." The façade of this

building is unusually bold and massive, and of what does it consist? At the top we have a leviathan stack of chimneys, under that the hugest possible cornice and frieze, under that a third story, and under that a second (with a monstrous balcony), and under that a first (with detached columns and a heavy entablature), "and under that—nothing!"

Should our traveller, on reaching the Bank, feel inclined to inspect the City shop-fronts, and there are many of them (though we make no allusion to the wholesale houses), he will still find much to make the artistic heart ache; but at the same time he will meet with many excellent correctives. The ubiquitous glazier is far less omnipotent in the City than at the West, and much as there may still be to deplore, the careful observer will find that within the last few years a large number of shops have been reconstructed with taste, judgment, and common-sense. The same remarks apply, to some extent, as we proceed westward towards Charing-cross. The mania for plate-glass does not so universally prevail along the route we now take as in the parallel thoroughfare that we lately traversed. The houses in Fleet-street, for instance, are both smaller and much older, and consequently require a greater caution in cutting about and dealing with generally. Near to that astounding monument of civic wisdom—the Temple Bar Memorial—are some of the houses of real Old London, and their shop-fronts having been partly modernised, are queer, difficult to exactly approve or condemn, but at least free from much that is offensive elsewhere.

As we begin to sniff the West-end atmosphere, we are conscious of the returning taint till we at last reach Regent-street, the arch-offender of all. In the upper part of it, near the Polytechnic, many of the fronts are correct in treatment, but they evince, as a rule, such an utter want of taste that their general appearance is dismal and depressing. Below Piccadilly are several extremely fine shops, to which we shall return. But what we mostly recognise as Regent-street — *i.e.*, the portion lying between Oxford-circus and Piccadilly, presents an almost unbroken sequence of everything that is bad. Even the Edgware and Tottenham Court-roads (thoroughfares habitually associated with all that is cheap and nasty) can show nothing worse, if even so bad, as Regent-street. Here plate-glass reigns supreme. The noble sweep of the Quadrant is entirely ruined by it, for there is hardly an inch of structural support visible throughout the whole line of shops on either side. And yet the solitary front of the St. James' Restaurant, with the tipsy-cakes and *marrons glacés* in the windows, suggests, most tantalisingly, a treatment that would have made this fine range of buildings a credit to London, had the ground-landlord insisted upon the shop-fronts being in keeping with the architecture. In the centre of the west side there is a range which is somewhat better. Huge columns extend to nearly the top of the houses, and between them the shop-fronts are treated in somewhat of the old method. One of them, indeed, that of Waugh, the chemist, appears to be an old one. But they all err in showing no means of support for the brick-work between the columns. The two really fine façades next the Circus—viz, Peter Robinson's and Jay's, show the miserable fate of the Quadrant, and almost reduce one to despair. In the western part of Oxford-street the old fronts are much the same; but many of the shops have been rebuilt, and the new ones are mostly passable, and some of them very good. Baker-street and Berners-street both possess a good many quiet and unobjectionable fronts, produced, in many cases, by the simple process of enlarging the windows of private dwellings, and giving them circular or elliptic heads, or making them to correspond in form and size with the entrance doorway.

Piccadilly unquestionably takes a higher rank in the scale. Hardly any of the shops are new, but they have generally been built with a solidity, and treated with judgment and common-sense, such as we seldom find elsewhere. They are certainly, as a set, the best that we know of, with the one great exception of Bond-street, where, happily, all is different. It seems strange that so great a divergence should exist between such neighbouring thoroughfares as Regent-street and Bond-street, yet so it is. Throughout the whole length of the latter there is hardly a shop, from Smyth and Nephew's modernised version of the good old front, to those that are still unfinished, that cannot lay claim to some sort of admiration and respect. The older ones, as a rule, are better than those in Piccadilly, and the new—where the leases have fallen in, and the houses been rebuilt—are a joy to look upon. Still there are, we regret to say, even here, three notable exceptions. Arrowsmith's poverty-stricken little front is utterly unworthy of its situation, and a degenerate scion of its predecessor. Chappell's ungainly building, with its wretched pseudo-Gothic carving, makes one shudder; and Mayer's hideous travestie of a bad church-window, *executed partly in stucco*, and extending to the second floor, is simply an insult to the nation that stands first in its appreciation and practice of Gothic art. As a whole, however, Bond-street comes triumphantly to the fore, and worthily maintains its long-established reputation as the first business street for excellence of every kind in the civilised world.

It may not be out of place to inquire a little as to how the state of things that we have described as existing in the leading London thoroughfares, has come about. Its latter development is, no doubt, to be accounted for by the keen competition which our rapidly-increasing population has engendered, and which has produced another evil of almost equal magnitude—viz., the huge system of advertising, which is now so prevalent. But its commencement was probably due to the opening up of the Continent during the long peace which preceded the Crimean War, and was further stimulated by the Great Exhibition of 1851, when we first realised, to our dismay and mortification, how far we were behindhand as a nation in all matters of taste. As our tradesmen gradually made the acquaintance of the Paris shops, a laudable desire inspired them to rival—if not to surpass these; but wanting the "je ne sais quoi" of French taste, they fell into the fatal error of confounding a vast shop-front, crowded with half their stock, with an attractive exhibition of the wares they wished to sell. Another feature in the work was, undoubtedly, the abolition of the window-tax, and still more, the removal of the duty on glass. The consequence was that sheets of polished plate were turned out of a size and at a price that would never have been dreamt of fifty years ago, and that consequently offered an irresistible temptation to the uncultured many. But a still more patent instrument of evil has been the growth of a particular business known as that of the "shop-fitter." Rarely is a London shop-front either designed by an architect or erected by a builder. As a rule it is arranged and constructed by the shop-fitter. We have no wish to undervalue the services of these gentlemen. They are specialists. Shop-fronts and show-cases require a combination of strength and lightness; the latter must exclude the dust, as far as possible, and are frequently required to be air-tight. They consequently demand the most careful and accurate workmanship, and the mode of their construction varies almost as much from ordinary joinery, as does cabinet-work. In fact the shop-fitter holds much the same relation to an ordinary respectable builder, that an oculist or obstetrician does to a general medical practitioner. But specialists, in their enthusiasm for their particular groove of work, are apt to lose sight of the broader principles that animate those whose professional duties, or business avocations, are of a wider range, and more varied in their nature. We must, therefore, hold the shop-fitter responsible for a great deal of the mischief we are condemning, and we adduce two sets of facts in support of our opinion. Firstly, the business of the shop-fitter is almost peculiar to London, and though he occasionally operates in provincial towns, these, as a rule, rely upon their own resources, and the shops consequently bear a greater stamp of individuality and right treatment than their average London brethren. Secondly, nearly all the best London fronts, as will be seen when we come to quote examples, belong either to professional decorators, or to those engaged in the cognate arts, and bear unmistakable signs of skilled architectural thought. There is no reason whatever why the shop-fitter should be deprived of the work he executes so well. But we would seriously advise everyone who has to remodel his shop, to obtain, in the first place, a thoroughly good design. The few guineas that this may cost him will be well bestowed; and instead of owning a shop-front, garish, vulgar, and wasteful, he may become the proprietor of one that will not only display his goods in the most effective and economical way, but will be in itself "a thing of beauty and a joy for ever."

The next point that we have to consider is what should be the characteristics of a thoroughly good shop-front. Firstly, it should be correct in structural treatment. A solid brick-and-mortar superstructure, of perhaps three or four stories, supported, apparently, upon nothing but sheets of plate-glass, is simply an architectural lie; and, as such, it is debasing to the public taste, and inflicts an incalculable injury upon the whole cause of art. Secondly, it should be specially adapted to the particular business in which its owner is engaged. A shop-front suitable for the exhibition of American organs would be totally unfit for the display of diamond rings; and one specially arranged for butchers' meat or dairy produce, would hardly commend itself to a Court milliner. But of this we shall have more to say presently. Thirdly, it should be so arranged as to economise the amount of goods necessary for effective display, and to reduce to a minimum the inevitable damage caused by their exhibition. For it must be borne in mind that silks and many other fabrics fade from the sunlight; prints and music get soiled with the smoke and soot; provisions become dry or tainted; plate and jewellery tarnish by the fog and gas; and clocks and watches suffer from the clouds of penetrating dust that accompany the east wind. This important deterioration of the traders' goods, as well as the interest on the capital sunk in a vast and constant display, forms—like the cost of supporting the existing vampire of Advertisement—a very serious item in his working expenses. These are all so much absolutely unproductive expenditure; in fact they constitute a national loss; and, as such, must, in the long-run, come out of the consumers' pockets, in the form of enhanced prices. Lastly, every good shop-front should possess a distinctive character of its own (unless, of course, it be part of an uniform range, like the Quadrant), and should be so designed as to set off and enhance the effect of its contents, either by the contrast of severe simplicity, or by some

harmony of analogy with the goods to be displayed.

Like the Ages of Man, the best modern shop-fronts may be roughly classified under seven types, which we shall now proceed to describe. Such a classification must, necessarily, be an imperfect one; and must, in fact, be accepted in much the same spirit as the great, but unzoological German's idea of a camel, which—after listening to various and conflicting descriptions of the animal—he finally "evolved out of his own inner consciousness." For the individual specimens of shop-fronts run so much into each other, in their treatment, that the more salient features they may possess in common can, obviously, alone be treated of.

But we may first pause for a moment to notice a modern treatment of the old form of front, which is sometimes much to be commended. Plate-glass naturally takes the place of the small squares, and the work is altogether on a bolder scale; but the type is a good one, and excellent examples of it are afforded by Hill's and Frazer and Hawes' shops in Regent-street, and by those just finished in the Bond-street "Arcade."

The first type of front that we shall consider is what we may term the "Classical." It arises from the vast size of many modern business premises, and consists of one long entablature supported at regular intervals by piers or columns, the whole intervening spaces, from cap to base, being filled in with single sheets of plate-glass. Among the best that we have noticed are those of Howell and James in Regent-street, Miller and Sons in Piccadilly, Redmayne in Bond-street, Hindley and Sons in Oxford-street, Filmer and Son in Berners-street, Kent in Holborn, and particularly Lewis and Allenby's in Conduit-street, constructed with red Aberdeen granite in the purest style of Roman Doric. No two of these are alike, but they are all good. Jackson and Graham's otherwise excellent front is spoilt by the introduction of quasi-Moorish ornament in the little erections (which architects call Acroteria) that surmount each column in order to break the horizontal line. This glaring incongruity with Classic detail is plainly due to the biased pencil of the late but *un*lamented Mr. Owen Jones, out of whose hands the rest of the ground-floor was probably removed. The front of Lane's fine tea-shop in New Oxford-street suffers from the glass being set too far back behind the columns, so that the contents of the window are not visible till the spectator is directly facing it, and for this reason pilasters or engaged columns are perhaps preferable to those entirely detached. When judiciously treated, this form of shop-front is eminently adapted to the exhibition of large articles, such as cabinet and upholstery work, pianos, &c., and is certainly the best for huge drapery establishments. But it must be borne in mind that its essential features are simplicity, uniformity, and repose. Marshall and Snelgrove's enormous front is good in intention, but is too Frenchified and "bizarre," and so loses this very repose, and detracts from the effectiveness of the goods displayed.

The next variety may be almost described as a modification of a single bay of that we have just spoken of, and bears much the same relation to it as did the country to the town mouse in the story of our nursery days. Here we find the houses somewhat narrow, and each has its different business. The upper part rests securely upon the entablature, which is supported by stout piers on either side; but the single sheet of glass is replaced by a couple of windows, and an entrance door-way formed by substantial wooden framing. The windows are seldom carried down below some two feet of the ground, and there is usually a stallboard, beneath which some strong glazing, faced by ornamental ironwork, affords light to the basement. Specimens of this type are to be found upon the Holborn Viaduct and at the Grand Hotel, Charing-cross, though we must be careful to exclude Mr. John Brogden, the "art goldsmith's" shop, where "Art" is curiously innocent in its appreciation of architectural truth. Others will be found in the fine range of buildings lately re-erected by the Mercers' Company between Ironmonger-lane and Old Jewry, with but little variation from Sir Christopher Wren's original design. Helbronner, of Oxford-street, and W. J. Thomas, of Bond-street, furnish admirable examples of this mode of treatment, which is specially suitable for such businesses as those of the watchmaker, the chemist, and the various dealers in small or fancy articles.

The third form approaches the most nearly of any to the dwelling-house, from which it differs chiefly in the various forms and larger size of the windows, the sills being usually—though not always—about breast high. The effect is extremely simple; and when the establishment is a large one, windows of this kind are more fitted for such things as books, music, and drapery materials, boots, bon-bons, Camembert cheeses, jellied galantines, and "pâtés de fois gras," than the more spacious ones that characterise our first type of shop-front. Instances of this way of dealing with the building will readily occur to those who have had occasion to visit Novello's in Berner's-street, Lacon and Ollier's in Bond-street, Gillow's or Cowtan's in Oxford-street, or Druce and Co.'s in Baker-street.

The fourth type that we have to adduce is wholly different from the preceding. Now architecture proper steps in, and so treats the ground-floor of a good-sized house as to leave a single large central opening in the wall, environed by legitimate structural ornament, in the Italian or Renaissance styles, to be glazed with one vast sheet of polished plate. On either side are entrance-doors—the one giving access to the shop, the other to the private house above. Or instead of one, there may be two smaller windows, in which case, a single entrance answers both the above requirements. These are among the very best forms of shop-front extant, and lend themselves particularly to enhance the artistic appearance of large "articles of virtu," such as inlaid cabinets, massive candelabra, and tapestries or stamped leather, as well as of decorative paintings, pictures by the Italian masters, or high-class costumes. Of the dual treatment, the best examples we can point to are Morant's front in New Bond-street, and Truefitt's in Old Bond-street. The finest with single windows, that we know, are Unwin and Albert's in Regent-street, and Wertheimer's, Donaldson's, and Pratt's in Bond-street. In fact, the last-named is one of the most artistic fronts in the whole of London. Immediately opposite to it is a little front (that of Tessier) somewhat different in treatment, with two windows and a central door, but which deserves notice as an instance of what is most suitable for a jeweller and silversmiths' business.

The class of shop-front that we have next to deal with is a very difficult one to describe. Under it we group together six examples—the only ones that we can call to mind as worth mentioning—not on account of any similarity of form, but because of the spirit that animates them, and has prompted a recurrence to the best periods of domestic architecture for lines on which to design structures suitable for modern requirements. The shops we allude to are those of Marks, Durlacher, Brothers in Oxford-street, Felix and Wayman in Charles-street, Soho-square; Palmer in Great Portland-street, Hollender and Cremetti in New Bond-street (originally built for Donaldson), Cardinal and Harford in Holborn, and Collinson and Lock in Fleet-street. There should, indeed, be a seventh example, at 100, New Bond-street, for we well remember Mr. W. J. Green's excellent design, which was in the Academy last year; but from some cause or other this building has never been completed. In Oxford-street is one other attempt in the same line—that of Duvun, a little west of the Pantheon; but the structural treatment is here so feeble, that we invariably pass it by at a hand gallop, for fear it should tumble about our ears. Our six exemplars are all more or less artistic. The Mediæval, Elizabethan, and Queen Anne styles have each been laid under tribute, to say nothing of a certain Dutch feeling that never became quite incorporated with English architecture. But notwithstanding the variety of form and treatment, these fronts have certain features in common—viz., the abundant, almost exclusive, use of wood in their construction, the solid character of this woodwork, the liberal use of carving for its embellishment, the employment of plate-glass only where it is needed to give a clear view of the "exhibits," the use elsewhere of small panes—sometimes glazed in quarry—as a means of decoration, and the adoption of the broad old moulded sash-bar. The whole of the woodwork is generally painted with some light colour; and notwithstanding our London climate, we consider a warm white the best for the purpose. Greatly as we admire these shop-fronts, we cannot recommend them for every species of business. There is a delightful artistic quaintness about them: their essence is the picturesque. But while there would be a melancholy incongruity in their devoting themselves to the exclusive interests of garden-rollers, or kitchen meat-screens and toasting-forks, they assimilate themselves, in the most agreeable fashion, to such things as delf and ancient pottery, old pictures of the Dutch and Flemish, or Early Christian schools, æsthetic paper-hangings, "too-too" tapestries, and all kinds of art-curiosities in general.

"The sixth age shifts into" a type of shops constructed specially for the display of manufacturers' own productions, such as glass, china or hardware. They are not of vast size, and present no particularly noticeable features. But they group themselves together as partaking, in an unusual degree, of the architectural character of the whole building, of which they seem to be the outcome, and as specially answering their individual requirements. One of the best is Elkington's in Regent-street, but Mortlock and Sons, that adjoins it, Mortlock's in Oxford-street, and Osler's near the Princess's Theatre, and especially their new front in Newman-street, are all good specimens.

The last type of all is by no means a return to "second childishness," but, singularly enough, it reverts to some of the principles that are described as governing the construction of the old-fashioned shops, though with a modification. The stout brestsummer, with its side piers, now reinforced with a couple of additional intervening iron shafts, or light stone columns, again supports the house above. But instead of the front projecting into the street, as was sensible enough when traffic was small and passers-by were few, it is now recessed back sufficiently to afford the observer shelter from the sun and rain, and allow him to notice the contents of the windows unjostled by "the madding crowd." Sometimes the windows are canted back at an obtuse angle from the wall line to the entrance-door, which is in the centre; sometimes the whole recess is rectangular, it is usually paved with tiles, and certainly lends a few moments' agreeable retreat from the increasing bustle of the streets. Such a form of shop-front seems equally adaptable, according to the details of its treatment, to

almost any description of business, as will be seen from the examples we adduce—viz., Boosey and Sons, the music publishers, in Regent-street; Dickinson's, the fashionable portrait-painters, in Bond-street; the Autotype Company's in New Oxford-street, and Challen and Sons, the pianoforte-sellers, in Hanway-street. This is a type of business premises possessing many advantages, and one that we certainly hope to see brought further into use.

From the foregoing remarks it will be seen that, terrible as was the state of things into which we had drifted, much has latterly been done to remedy and "reform it altogether." The best shop-fronts are now usually designed by architects of skill and reputation; and those erected during the last two or three years are, as a rule, remarkable for their excellence. Indeed, many of them have emanated from the fertile and artistic brains of Messrs. Pearson, Murray, Grim, Norman Shaw, Edis, and others.

If those who have to alter their premises will carefully select a type of window most in keeping with their line of business, and will follow the example of the more cultivated among the tradesmen and manufacturers, and see that their design is characterised by truth and taste, our streets will soon assume a different aspect. "A nation of shopkeepers" we shall always be; but there is no possible reason why our shop-fronts should disgrace us.—J. G., Libra.

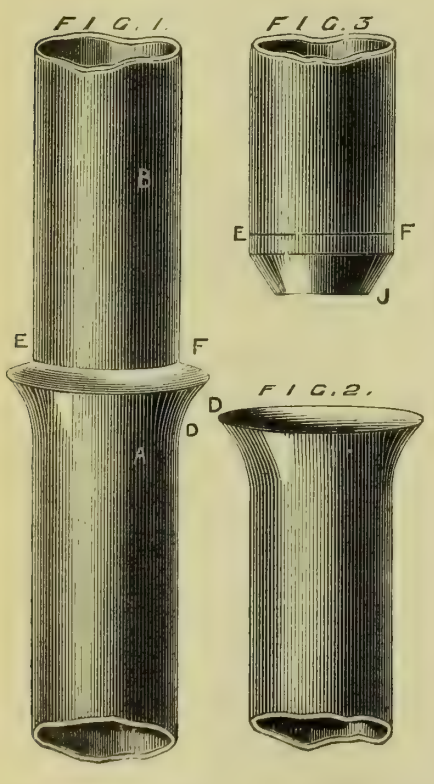
PRACTICAL NOTES ON PLUMBING.*—II.

By P. J. DAVIES, H.M.A.S.P., &c.

JOINT-MAKING, BY COPPER BIT, AND BLOWN.

AFTER the apprentice has learnt the rudimentary part of the casting, he should be put to prepare a few joints. The first is the copper-bit joint.

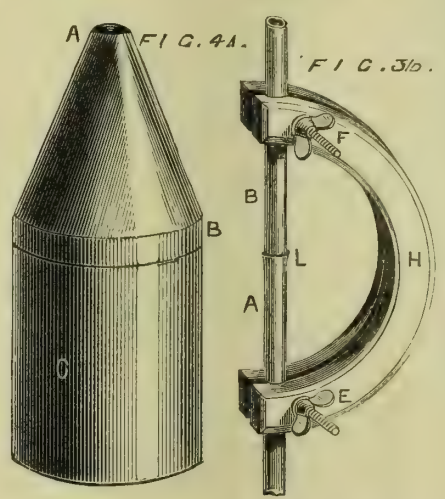
Take two pieces of lead pipe (say 1in.) and with your saw, "which should be sharp and about 15in. long, with panel-saw teeth," cut one end true, and with a turn-pin G, Fig. 1,



just open, same as shown at D, Fig. 2, then with the shave-hook Q, Fig. 1, which should be kept sharp by the use of a saw-file, shave all round the inside where you would have the solder unite; next take the inner or male pipe, Fig. 3, true the end J, then with a 12in. or 14in. rasp, middling cut, rasp the end of this pipe to the bevel as shown, then with the shave-hook shave the end just sufficiently high to come above the top of the female part, as shown at F E, Fig. 3. Now fix the same firmly as best you can in an upright position, as shown in the cramp Fig. 3 D, also as shown at Fig. 4. Next see about soldering the same. The first thing required is a "hatchet-bit" L, Fig. 1, Fig. 3 A, also Fig. 3 B, which shows the best shape for general use. This tool is made of copper; therefore you must never exceed a red heat when shaping same. If you do, you are liable to melt it; before you can use this tool there will be something for you to *thoroughly understand*—it is the tinning of same, which is done as follows:—Make it just hot enough to melt fine solder (to be hereafter explained), which is a mixture of two parts of block-tin and one part lead. Then rapidly file the end of the tool or iron quite bright and rub this part on a piece of tin called a tin-pan with plenty of resin and solder mixed together; this will put a face upon it as it is called: that is to say, that part which you brightened will be tinned over. Next make the iron a little hotter and put some powdered black rosin from the rosin-box, Fig. 4 A, which is made of tin, copper, or zinc, all around the joint, and with the iron melt a little solder all around, taking care not to have the least dirt in your work or rosin. Having melted sufficient solder around your joint, run the nose of your iron well into the solder (hence the reason for having the point of the iron this shape), and well tin your lead, also float the solder round the joint, which is done by drawing your iron (when well hot) steadily round from one side to the other; the joint should be left as smooth as any part of the lead, as shown at E F, Fig. 4, which is done by having sufficient heat in your iron. After all is done, if you have made much mess with the rosin, take some touch and rub over your joint or the dirty part; this, if done when the rosin is hot, will soften same, and you can wipe all away with a small piece of rag.

BLOWN JOINTS.

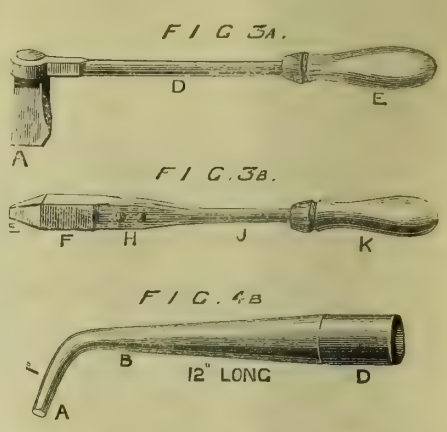
A blown joint is made in a similar manner, excepting that in place of an iron you use a blow-pipe and gas or rushes to melt your solder, which can be done with a very little practice.



The Fig. 4 B, is the general shape of blow-pipe used.

WIPED JOINTS—PREPARATION.

With the apprentice these joints are not quite so easily made as with the copper bit, but with a little practice you will soon get over the difficulty. In the first place, you will prepare the male end as you did for the copper-bit joint, excepting the shaving, but the outside pipe will not be required to be opened quite so wide as before, but as shown in section at K, Fig. 5, (see next article). Here you see that the male and female ends are rasped off. This is in order that you may have a little more solder around the joint without extending the size of same. Now, having all cut and fitted, you will require the ends of the pipes clean from grease or oil. This is done by rubbing a little chalk, whiting, card, wire, or glass-paper over same, and well rub it off with an old felt or anything else. Next the soil, smudge or tarnish is a very



important thing in wiped joints, especially to the boy.

THE SOIL AND SOILING

Is very important to the young beginner, but in after-life with a little practice he will be able to dispense with it. I was for four years in regular metal-work called "wiping joints," and never used a bit of soil. Mr. Graham, the lead-caster before referred to, has done the same. The soil is made as follows:—Take 1lb. of lamp-black and make it red-hot in your metal-pot, stir it well up and let it cool, then take 2oz. of pounded chalk and mix well together in water, well grind, with trowel or otherwise, the ingredients together, to the consistency of butter and as fine (a painter's muller and stone will expedite the operation); make it pretty stiff; lastly, take about ¼lb. of melted glue—some glue is stronger than other, so that this will vary—stir well together when well hot, and it is fit for use. Thin it to the thickness of cream and use it *cold* as required. The method of testing it is as follows:—Take the ends of your prepared or cleaned pipes and paint them over with a thin coat and dry it: if it rubs off it has not sufficient glue in it; if it scales up it has too much glue, or has been put on too thickly, or the pipe may be greasy—of course you can burn or blister this soil if too thick. If the solder hangs to it there is too much glue, and will shine, or it is short of chalk. Good soil should work like paint, not rub off, blister, or hold the solder, its effect being to prevent the solder adhering to the pipe not shaved. The soil-pot should be made of copper. A small sash-tool half worn out is the best to work the soil with, unless on large work such as cisterns, &c. When putting it on it must be straight, and without daubing your work all over. Cut the edge true, as nothing looks worse than slovenly soiling. Soil your joints from 3in. to 4in. past the solder-line.

THE SPLASH-STICK

Is made of wood, about 6in. long, 1¼in. wide, ⅛in. to ¼in. thick, shaped for holding. Some use iron, but I do not like it, as you are apt to scratch the soil off the lead.

THE CLOTHS.

I do not know any tool more important than a good cloth. It should be made as follows:—

Take a piece of new mole-skin or fustian (the former is the best) of moderate thickness, for ½in. joint, 12in. long by 9in. wide, then fold it up one side 4in., then 4in. again, and again 4in., then fold it in the middle, which will make your cloth 4in. by 4½in., and six thicknesses thick. This is suitable for ½in or ¾in. underhand joints. After this is done, sew up the ragged ends to keep it from opening. Then melt a little tallow and pour a little on one side, and the cloth is ready for work. Keep to this side, occasionally rubbing a little touch on this face side. If the cloth is too rough, rub a little chalk upon the face. The use of the tallow is to prevent the solder from sticking to or burning the cloth. It also makes the solder work smoothly.

J. P. DAVIES' CLOTHS' TABLE FOR DIFFERENT KINDS OF CLOTHS.

This Table is for a moderate thickness of ma-

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terial; if very thick, one thickness less. *Underhanded* "to be made as before."

PIPE.	SIZE OF CLOTH.	THICKNESSES.	REMARKS.
Diameter in Inches.	Inches.		
½ to ¾	4 × 4½	6	After 2½in. use two cloths, the ¾in. for finishing, and the large one for getting up the heat.
1	4½ × 4¾	8	
1¼ and 1½	4¾ × 5	8	
2, 2½, and 3	5 × 6	8	
3½, 4, and 4½	6½ × 8	9	
5 and 6	9½ × 10	10	

BRANCH AND UPRIGHT.

PIPE.	SIZE OF CLOTH.	THICKNESSES.	REMARKS.
Diameter in Inches.	Inches.		
½	1¾ × 2½	6	Some prefer a size larger, but the smaller the better, in some cases.
¾	2 × 2½	6	
1	2½ × 2¾	8	
1¼ and 2	2½ × 3½	8 to 10	
2 and 6	3 × 3½	10	

CISTERN CLOTH.

2½in. × 3in. | 8 to 10.

TRAPS AND ODDS AND ENDS.

2½in. × 2in. | 6, or the ¾ cloth.

Sew the 5in. and 6in. cloths all round, and from corner to corner diagonally. When working 12in. to 18in. joints underhanded, larger cloths are required, and are worked two-handed or by *two plumbers*. Before you begin to wipe your joint, stop the ends of the pipes to prevent draught, which will make a very great difference when you are at work with the metal.

(*To be continued.*)

DR. WALDSTEIN ON GREEK SCULPTURE.

LECTURE V.

THE sculptures of the Parthenon formed the text of a demonstration given by Dr. Waldstein on Friday afternoon, in the Elgin gallery of the British Museum, before the students of King's College, Strand. He had now, the lecturer remarked, reached in his exposition a period when the sculptor, having obtained complete mastery over his material, was confronted by the question, What subjects should he choose from the world of possible ones, for representation? To reply to this inquiry made the greatest demands on the artistic spirit and inherent tact of the sculptor, and the artist who most successfully solved the problem, by executing works which embodied lofty conceptions of all that was grand, noble, and permanent in human life, was Pheidias. The works in which he achieved his greatest triumphs, the statues of Athené in the Parthenon of Athens, and of Zeus in the Temple of Olympia, were no longer extant, but we must accept the numberless descriptions and allusions to them by classical writers, as evidence that they were of unapproached dignity and grandeur. These statues of the gods formed each the leading feature in the larger chamber of a temple naos. They were each of colossal size, and formed of plates of ivory and gold built up upon a framework of iron. The effect of this luxurious combination, as seen in the probably subdued light of the temple, was far beyond the power of description, or of our dreams, and was only paralleled, perhaps, by one or two works of Raphael, and a few by Michael Angelo. Though these statues had long since been destroyed there had come down to us as examples of this highest period of sculpture some of the smaller decorative features of these temples, executed, as we knew, in the time of Pheidias, and probably by assistants, varying in their capabilities for rendering his thoughts into material forms. Although they differed in excellence, yet the sculptures from the Parthenon — which they saw around them in that gallery—battered and mutilated by the lapse of time, and still more by the violence of ignorant men, were the highest manifestations of conceptive skill and taste now existing, and they would bear—as indeed they required, to understand their meaning—long, patient, and attentive study. Having sketched the history of the Parthenon from its erection, B.C. 438, till its conversion successively into a church and mosque, and its partial destruction by a gunpowder explosion in 1674, the lecturer showed that the sculptures now existing consisted of the outer portions of the east and west pediment groups, parts of the frieze, and many of the metopes. These remains of the pedimental sculpture were ranged on either side of that room; the eastern one represented the Birth of Athené, and the western one the Struggle between Athené and Poseidon for the Attic soil. In the former they had in the southern angle the sun-god Helios, driving his horses and rising from the sea; a group balanced at the other side by Selené, the moon-goddess, and her horses sinking into the waves; either was supported by nymphs, while the centre of the composition was formerly occupied by the new-born goddess, attended by the elements. In the west pediment the emulation to be patron of the city of Athens was emblematised, and they would remember that Poseidon (Neptune) formed by a miracle a salt well on the bare rock of the Acropolis, while Athené (Minerva) planted beside it an olive-tree, and was adjudged the victor; it was this moment which was represented. The eastern group was in its conception and scope cosmogonic, the western, local. The former was bounded by Time, the sun and moon typifying the universality of the idea; the latter was essentially Attic, and had at either end the nymphs Kaphissos and Ilissos, representatives of local streams. The subjects themselves were well determined from classic description; but as to the individual gods personified, there were as many as 20 theories in the eastern, and 26 in the western pediment, which were duly set forth in the British Museum handbook. To these 20 theories, as to the former, he was, after many years' study, reluctantly compelled to add another. It was considered by Brün, of Munich, that the majestic figure next to Helios personified the Mountain Olympus, whose head was first to see the rising sun. In that view he concurred, and he would invite attention to the self-contained power displayed in the figure, to the firm quality of texture and good detail of modelling, as worthy of close study. At the other side of the composition next Selené was a reclining female figure, fully draped, of which the head and extremities were now missing. It had been usually described as Aphrodite, and many critics had remarked upon the restless, rippling, yet very graceful lines into which the figure and its garments were thrown. He ventured to identify this very beautiful figure with Thalassa, the personification of the sea, represented as resting on the bosom of the Earth, the next statue. Turning now to the remains of the east pediment, they found a great gulf fixed between the development of drapery-sculpture in one and the other, this eastern one showing to the fullest extent the advance made by Pheidias in the symmetrical arrangement of folds and expression of texture. At the same time, while the distinctions between the skin and the garments and between the various qualities of material were very marked, there was no attempt at realistic treatment. In this, as in the other pediment, a river-nymph and a deity were placed at either end of the composition, but the relative positions were reversed. Of the central figures the torso of Neptune, portions of a chariot, and perhaps a fragment of the victorious Athené remained. He must now pass to a description of the frieze of the Parthenon. Its position, surrounding the external walls within the columns at the highest level, and overshadowed by the cornice and columns, rendered its decorative treatment a difficult problem, and it was one which Pheidias solved in a masterly fashion. There could be no deep relief, especially on the lower portion, because of the necessity to avoid shadow and to deal with it as a feature to be seen only from below. Accordingly the relief was very low, only about 2in., and the relative height great; yet he succeeded in showing three planes of action on this shallow surface, by means of outlines, undercut a little in the upper portion. The subjects, starting from the south-west angle of the temple and meeting on the east front, were the annual and four-yearly pan-Athenaic processions, showing a succession of horsemen, charioteers, groups of men on foot bearing vessels, sheep and oxen, and women carrying vessels, represented with a freedom and irregularity which gave life and spirit to the whole. On the east front the shorter and longer processions grouped themselves on either side of various seated and standing figures. This culminating scene had been identified as the offering of the peplos to Athené, but he considered to be simply the preparation for the sacrifice of the hecatombs of victims; the priest was handing his outer garment to an attendant boy, and was surrounded by priests and priestesses. Close by these were several of the gods, including the seated figure of Zeus, Hera, Artemis with her torch, seated close to her brother Apollo; Athené, the most important figure, occupied the centre, while beyond were Poseidon, Dionysius, Aphrodite, who forms the link with the procession by pointing out its leading figure to her son Eros, who is upon her lap.

LECTURE VI.

Dr. Waldstein commenced his sixth lecture, delivered at King's College, on Tuesday, by exhibiting restorations of pediments of the temple of Ægina and the Parthenon, to show the great advance, not only in technical manipulation, but also in composition, manifested in the latter. While the Æginetan pediments exhibited some skill in fitting the group to the triangular space, the effort to compress the figures was too obvious, and all the figures were inclined towards the centre and looked outwards directly at the spectator. In the Parthenon pediments they saw the dramatic interest converging as distinctly at the centre of the space; but the irregular movement and flow of actual life were followed in turning a few of the minor figures away from the main group; at the same time it was worthy of note that the backward movement never equalled in force that towards the principal figures, but the fluctuating rhythm always grew towards the centre. While the whole composition was full of life there was no violent excitement and no unpleasing contortion in the subjects. The painstaking thought, as well as the tact or genius of Pheidias, were clearly revealed by an examination of these Parthenon pediments. Pheidias had many followers, some of them highly gifted, but cannot be said to have founded a school of sculptors. Amongst those who learned from him was his contemporary and so-called "pupil," Alkamenes, the sculptor of the west pediment at the temple of Zeus, Olympia, of which many fragments had been found by the German explorers recently; the east pediment was known to have been the work of Paionios of Memne. In the discoveries lately made at Olympia, nothing of the broad, generalistic, typical spirit of Pheidias was apparent, and the remains had been at first far over-valued artistically because seen through the medium of the descriptions of ancient authors. The work of these Olympian artists evinced a desire to give the pictorial effect of colour by modelling; at the same time there was a want of uniformity in their style. Brün had assumed, and apparently with reason, that Alkamenes being at Olympia when Pheidias came there, was greatly influenced by his style and mode of working in his subsequent statues. Of Alkamenes' work we possess what was believed to be a copy in the Enkrenomenos, a figure of a pentathlete which had been restored in error as a discobolos. They had seen that in the works of Pheidias the chief characteristics were a selection of the broad type of man, and in the choice of subject a certain width of figure and firmness of line. These qualities were reduced to an academical canon of proportions, a formal theoretical code of rules, by a master of the Peloponnesian school, Polykleitos of Argos, an artist who was sound in his teachings and principles, but who, as Quintillian told us, never reached the height of the gods, though he made men higher than they were before. This was very evident in his work, which had not the mark of the genius, but of the painstaking workman. He had, by a perversion of historical fact, been classified by Murray as archaic, but his works, although based on earlier styles, was not "archaic." His statue of a Doryphoros was designed as a normal man and was described to us as square and massive, round and well set. Brün thought he had discovered in the Farnese collection at Naples a replica of this type, of course restored as a Discobolos; it had on its shoulder the groove of a spear, and this had led to the identification of other Doryphori at the Uffizzi, Florence, and at the Vatican. We know that Polykleitos was the first to model a statue

resting its weight on one leg and dragging the other leg behind it. The highest period was now declining in nobility, but died only slowly. Its declension was due to a variety of causes, religious, political, and ethical, each reacting on the everyday life of the Greeks. The worship of the higher gods, Zeus, Hera, and Athené, had not its former hold on the people, and artists no longer sought to personify their highest feelings of adoration and reverence, but represented subjects at best of love and admiration as Apollo, Aphrodite, or even of merely human sentiment, as Irene. The artist more and more gave himself up to depicting the tender emotions, and such a god as Apollo was now represented not as a perfect man, but as a lovely youth, and there was a decline into sensuousness. This decay was also apparent in the political world, for the Greeks were no longer fired with and united by a patriotic zeal to guard and preserve their country and their liberties. The glorious past was mused upon till the people lost their energy in romanticism and feeble sentimentality. This reacted on the arts, including sculpture, and there began a period of sophistication, in which the old simplicity was lost. The interval between Paionios and Praxiteles was bridged over by the father of the latter artist, Kephisodotos the elder, the sculptor of a famous Irene, in which the goddess of peace was represented carrying an infant in a cornucopœia. The cultus of this divinity itself marked a decline, and was instituted about 378 B.C., at the close of the Peloponnesian War. The statue had been identified by Brün, in a replica at Munich, which agreed with representations on coins, and descriptions, except that the infant had been restored as a Bacchus. It was the first example of a group properly so-called in sculpture, but the figures are not equipoised, the infant being as yet a mere accessory. Kephisodotos also executed a Hermes bearing the infant Dionysios. The work of his son Praxiteles showed a further decline; his figures, like the Aphrodite of Cnidus and the Lizard-killing Boy (of the latter of which many Roman replicas existed), were renowned for loveliness and beauty, but showed a fulness and roundness of contour, a hazy smoothness that contrasted much with the sharp, vigorous works of the Pheidias period. Skopas, who flourished at the same period, was distinguished by the pathetic force of his sculpture, exemplified in the greatest degree by his celebrated group of Niobe and her Children, in the replicas of which now extant there was a violent movement, a restless attitude and flow of garment but ill-adapted for representation in plastic art. Skopas was also known as one of the four artists employed in the decoration of the Mausoleum at Halicarnassus, 353-6 B.C. Amongst the later soulptors should be mentioned Lysippos, who was the first to place portraits on statues, and who executed those of Demosthenes, Sophocles, and others. The progress of naturalism and individualisation was now rapid, and in place of ideal representations of perfect strength, the athletes were now honoured by direct portraits. A new canon of a man was laid down in the Apoxionenos, a bather scraping his arm with the strigil, in which the head was proportionately smaller, and the body thinner, and more "dry." The pictorial aspect of things was now regarded, and the sculptor wrought with the conscious intention to place his subject in perspective. This led us to the last period in Greek art, that of a dramatic and sensuous character, and the current of art now divided for a time into three. There was the school of Pergamos and Rhodes, a dramatic type represented by Byron's so-called Dying Gladiator, now known to be a copy of a Gaul's figure, from a group in marble by Attalos, illustrating the conflict between the Greeks and Gauls, and by the equally celebrated replica of the Laocoön of Rhodes. This school flourished from 310 B.C. to 200 B.C. The second current was one of reaction to the simplicity of the past, and presented many puzzles to the student, who would find an apparently rude statue with elaborated medallion decorations on the garments; this was an archaistic but not archaic period. The third resulted from this, and was an eclectic current, corresponding to the Renaissance in architecture, and the recent pre-Raphaelism in painting. All re-united to some extent with the rise of the Roman empire, and art experienced a revival in the sudden demand for the works of new Greek artists to ornament the houses of the inartistic but wealthy Roman patrons of the arts. It was with the aftermath of Greek sculpture thus called into being that our museums and galleries were chiefly filled, but although much of this was mere Athenian shop-work, which failed to represent the spirit of the olden time, it was to these replicas that we were mainly indebted for our knowledge of the chefs-d'œuvres of the highest and later periods of Greek sculpture.

LONDON AND MIDDLESEX ARCHÆOLOGICAL SOCIETY.

THE annual meeting of this society was held in the Council Chamber of the City Guildhall, on Wednesday afternoon. The chair was occupied by the Lord Mayor, and afterwards by Lord Talbot de Malahide, the President. Alderman Hanson, F.S.A., having read a paper upon "Sir William Ashurst, Lord Mayor, 1694," Mr. Horace Jones, City architect, followed with one on "The Guildhall"; of this paper, which treated the building historically and architecturally, we shall publish an abstract in an early number.

Mr. J. R. Dicksee, the recently-appointed art curator, gave an account of the paintings and works of sculpture in the possession of the Corporation. These comprised about 100 paintings and 75 statues and busts, chiefly to be found in the Guildhall, but a few of the most important were arranged in the Mansion House. The Guildhall collection of sculpture included works by Sir F. Chantrey, Durham, John Bell, W. Calder Marshall, Bacon, and others. Of the pictures, the most important was the "Siege of Gibraltar," by John Singleton Copley, which occupied one wall of the council chamber; it was painted in 1789-90, at a cost of £1,500, a sum which would have been utterly inadequate at the present day. They had one portrait by Sir Thos. Lawrence, and two by Sir Joshua Reynolds, others by Kneller, twenty-two full-lengths of judges, painted in 1671 by one Michael Wright, who received £60 for each, and a valuable series of pencil drawings of Old and New London Bridge, executed by the late E. W. Cooke, with the aid of a camera lucida. Mr. Dicksee added that he recently had an enormous painting, representing the Battle of Agincourt, disinterred from the vaults to ascertain its value; he was compelled, however, to report to the Corporation that it would not be worthy of the space it would require, even if they had it at disposal, and so it had been sent back to obscurity. He might mention that he received an estimate for cleansing and restoring it, modestly asking £980.

Sir John B. Monckton, F.S.A., City clerk, gave an epitome of the charters and documents in the possession of the Corporation, which numbered about a hundred. Of these the principal were arranged in an adjoining committee-room, being those which had been mounted and framed for reference; it so happened that these, the most ancient documents, were by far the most concise. The first of these was a charter of liberties, granted by William the Conqueror to "William the Bishop and Gosfreghth the Portreeve and all the burghers within London, French and English friendly." A second charter in the same chest was from William the Conqueror, granting his man, Deorman, a hide of land at Gyddesdesne, Essex; this was the only document written in Saxon in the possession of the Corporation. There were charters of liberties granted by Henry II. and Richard I., and another charter by the latter monarch directing removal of kiddles or weirs in the Thames. John granted a charter to same effect, dated 1199, a charter of liberties, and another granting the shrievalty of London and Middlesex to the citizens of London. In 1202 John granted a charter to the City abolishing the Weavers' guild, now the oldest company in the City, on consideration that the citizens paid twenty marks a year in lieu of the eighteen marks heretofore paid by the said guild. The charter of 1214 was a charter giving the citizens, then styled barons of London, liberty to choose their mayor. In the same committee-room they would see several early MS. books, most of them richly illuminated. The first was a vellum manuscript "De Antiquis Legibus," dated 1274, and written in Latin and Norman French. The second "Liber Albus," written by John Carpenter, town clerk, in 1419. This was copied in 1582 under supervision of Robert Smith, when the old book, which had become soiled was termed Liber Niger. They would also see the Liber Custumarium, written on vellum in Latin and Norman French, 1154-71, the Liber Horn, 1311, bequeathed by Andrew Horn, citizen and fishmonger, to the City in 1328; the Cartæ Antiquæ, 1st Edward III. to 11th Henry VII., a vellum beautifully illuminated and coloured; and a letter-book, of 1275, being the earliest extant of the corporation records which had, from that time to the present, been regularly written and preserved.

The members then inspected the Guildhall premises and their more interesting contents, the civic regalia being shown and described by Mr. Benjamin Scott, City chamberlain, and the collection of seals by Mr. J. A. Brand, comptroller; of these the earliest was one of the time of Fitz-Alwyn, the first Lord Mayor, 1889. The library and museum were afterwards visited, Mr. W. H. Overall, F.S.A., the librarian, acting as guide in the former building, and Mr. J. E. Price, F.S.A., at the latter.

EDINBURGH ARCHITECTURAL ASSOCIATION.

THE annual excursion of this association took place on Saturday last, under the arrangement of Mr. John McLachlan, president. They proceeded to Linlithgow to examine the remains of the palace, and St. Michael's Church, which is still used as a place of worship. Mr. Kerr, architect, Edinburgh, in describing the palace, noticed that the name of Linlithgow was of Celtic origin, signifying the Lake of the Sheltered Valley, which even now applies to the natural features of the site, which is supposed to have been occupied as a Roman settlement, as pieces of pottery and other remains have been dug up from time to time. In some of the older records reference is made to a chapel, which is believed to have existed here along with some other buildings, as David I. of Scotland occasionally resided here about 1134. Much reliable information is now available regarding this and other buildings, from the Lord Treasurer's accounts and original ancient documents, having recently been published by the Government, from which it appears that Edward I. erected a peel about 1300, and spent Christmas of 1301 here. This peel was taken by stratagem, and dismantled by order of King Robert the Bruce in 1313, but it appears to have been repaired, and additional buildings erected. These, with the parish-church of St. Michael adjoining, were destroyed by fire in 1424, the year in which James I. returned to Scotland with his Queen, Jean of Beaufort. In 1425 he began the erection of a new palace, and to rebuild St. Michael's Church. The portions of the palace supposed to have been erected at this time were upon the west and south sides; about 1488 part of the south side appears to have been in progress. In addition to the kings already named, Robert II. and III. resided frequently in the castle or palace. James I. visited it about 1428, and the Royal family of Scotland occasionally occupied it up to the time of James VI., who left Scotland to ascend the throne of England on 5th April, 1603. His son, Charles I., was the last of the Stewart kings who visited Linlithgow Palace. Prince Charles Edward also visited it in 1745, and in the following year it was burnt when occupied by Hawley's dragoons, and reduced to the state of ruin in which it now appears.

The palace forms a quadrangle around an inner court, having high towers with stairs at the corners and in the middle of the north side, connected together by lower buildings. The foundation in the centre of the court was erected by James V., about 1538. There was also an outer court towards the south, inclosed by walls at the east and west ends; St. Michael's Church and the outer porch of the palace forming the south boundary. Looking at the building chronologically, the oldest part is the south-west tower, erected by Edward I., and portions of the west and south sides, built by James I. The next is the north-west corner, and original part of the north side, erected by James III. and IV. The latter also built the east side, containing the Parliament Hall and original entrance. James V. is said to have erected, about 1535, a portion of the south side of the quadrangle, built up the principal entrance from the east,

and formed that upon the south side of the palace. He also erected the entrance gatehouse or porch to the outer court, about 1530. The panels above the gate contained the Insignia of the orders of the Garter, Thistle, St. Michael, and the Golden Fleece, conferred upon him by Henry VIII., of England; Francis I., of France; and Charles V., of Germany. The north side previously noticed being much decayed, part of it fell in 1607. James VI., although residing in England, retained an interest in his ancestral palace, and had this side rebuilt between 1617 and 1628, from designs by Inigo Jones. The dates 1619-20 appear upon the interior front. King James also made extensive alterations upon the remainder of the palace, adapting many of the older apartments to the present arrangements. The barbican outside the original east entrance has occasionally been considered to be a part of the castle erected by Edward I.; but upon close examination it does not appear to be older than the date of building adjoining, erected by James IV.

The architects, or masters of works, engaged at the palace from 1425 to 1467, appear from the accounts to have been John of Walton, Robert Wedale. Robert Livingstone, John Holms, John Weir, and Henry Livingstone. Sir James Hamilton was architect to James Third and Fourth, and Inigo Jones to James Sixth.

Parliaments were held here in 1388, 1389, 1545, 1585, 1593, and in 1646, when Edinburgh was visited by the Plague.

On ascending to the first floor, the party traversed the several principal apartments. In the north-east corner is a large kitchen with anterooms on the north and east sides. The former communicates with the large dining-room and private apartments behind, extending along the north side of the palace. The other communicates with the Parliament-hall, which extends along the east side, measuring 98ft. by 30ft., with a gallery at the north end, and large richly-carved stone corbels spaced along the side walls. This apartment, which is lofty, had an open-timber roof. Behind the south end of the hall is a retiring-room, robing-room, and strong-room; from these, extending along the south side, is the chapel, which contained a gallery at the west end, and is lighted by tall windows on the south side, with bold, richly-carved stone corbels and canopies upon the intermediate piers. There are also some remains of the tile paving of the floor. At the west end of the chapel is the hall and priest's chamber, communicating with a corridor towards the inner court. Along the west side is a large room in which Mary Queen of Scots was born, with stairs from it leading to the apartments above and below. Adjoining the north-end is a State council-chamber, James III.'s bedroom, strong-room, and oratory, terminating with beautifully ribbed groined ceilings. The council-room shows the plan of the complete paved floor composed of tile and indented stone; the upper floors have been occupied as bedrooms and other private apartments. The top of the north-west corner stair is covered by an interesting groined roof, the ribs resting upon carved corbels with the letters J. and M. entwined, being the initials of James IV. and his Queen Margaret, daughter of Henry VII. Over this is a groined turret known as "Queen Margaret's Bower," referred to by Sir Walter Scott in the fifth canto of Marmion, as the place where Margaret retired, after her husband had determined to advance to Flodden:—

> "His own Queen Margaret who in Lithgow's Bower
> All lonely sat and wept the weary hour."

There is also a stone-paved promenade forming part of the roof of the south side of the quadrangle, enclosed by the high sloped roofs at the back and ends, and communicating with the four corner stairs.

The ground-floor is occupied at the south-east corner by several kitchens for the domestics and guard, also by a buttery and two guard-rooms. In the one at the entrance from the south, the Regent Murray died in the evening of the 23rd January, 1570, after being shot in the early part of the day by Hamilton of Bothwellhaugh. The south-west tower contains the prison, and the south-east a small stable for the king's horses. Adjoining the old east entrance is a dungeon, also said to have been occupied as a lion's den, but may have ultimately been converted to another purpose. It is, however, curious to note that in the Lord Treasurer's accounts there is charged in 1330 for food to a lion belonging to David the Second. In 1452 there is a payment to a keeper of a lioness belonging to the King. In 1474 James the Third got a present of a lion. There was a lion's den at Stirling Castle, a vaulted chamber in the Palace of Linlithgow, and a house of the lions at Holyrood in the time of Queen Mary. From the bottom of the stairs at the north-west corner there is a passage communicating with a door in the north front, leading to the archery-butts and boat-slips at the side of the loch. While viewing these, and walking around the palace, an opportunity was had of observing particularly the details of the masonry and stone-carving, which, except that upon the portion erected by Inigo Jones, show both externally and inside the palace a decidedly French character. The numerous chimney-pieces are of stone of various designs, richly moulded and carved.

St. Michael's Church adjoining was next visited. It is still used as the parish-church. Although an earlier chapel or church may have existed upon the site, the present building appears to belong to the fourteenth and fifteenth centuries, and is admitted to be an important specimen of an ancient parish-church, being of large dimensions, and containing interesting pecularities in its details. It has been a cross-church with an octagonal termination to the chancel. The tower at the west end was surmounted by a crown, similar to that of St. Giles, Edinburgh; but from fear of its insecurity was taken down about 1821. The beautiful west door and tracery of the windows are worthy of careful study; the tracery, which at first sight appears Flamboyant, is strictly Geometrical, and no design is repeated on the same side of the building.

Proceeding through a finely-wooded district to Binn's House, the property of Sir Robert Dalzell, who kindly granted the necessary permission to inspect the apartments, the ancient family mansion appeared, amidst groups of old trees, upon the western grassy slope of Binn's Hill. The oldest part of the building was erected in 1623, and by the additions made from time to time formed an irregular mass, which has been assimilated by alterations in the castellated style carried out early in the present century. The principal apartments, however, have not been much interfered with, and the panelled wall-linings, doors and finishings remain, showing the variations in style belonging to the respective periods of the additions. There are also several beautiful plaster ceilings of different designs, converted, in some cases by single mouldings, and in others by floriated bands, into geometrical forms interspersed by bold pendants. In one of the rooms a frieze is introduced, filled with fruit and foliage, which has a rich and pleasing effect. There are also some interesting specimens of ancient furniture in good preservation.

The collection of family portraits, and others of the Royal family of Scotland next claimed attention. It was said that some of these had been saved from the flames during the burning of Linlithgow Palace in 1746. When examining the portrait of General Dalzell, who was at the head of the army in Scotland in 1681, and the chief officer in raising the regiment of Scots Greys in that year, it was remarked that we were upon the spot where the regiment was embodied while its two hundredth anniversary was being celebrated in London.

Leaving the pleasure-grounds of Binn's House, the party directed their attention to Abercorn parish-church, still occupied as a place of worship. It belongs to the latter part of the Norman period, and is of an oblong form, measuring about 72ft. in length, and 15ft. in breadth. The original division of the chancel and nave is shown by a plain plastered arch, supporting a small bell-cot outside the roof. Considerable alterations have been made upon the original church, and buildings erected abutting upon its walls; yet there are some Norman features remaining, especially portions of two doorways, one with a zigzag moulded arch-head, filled in by a slab with lozenge-shaped ornaments upon the surface. A thick coating of roughcast over the exterior prevented any further details from being traced, but in some places where it had fallen off, the ashlar of the original walling appeared. The earth had also accumulated to a considerable height upon the walls, which led to the suggestion that if it was judiciously removed, the walls cleared of the roughcast and carefully pointed, the church would be rendered more comfortable, improved in its appearance, and enable any of the old architectural features that may still remain to be readily traced. Notwithstanding these drawbacks, the church has a venerable appearance, surrounded by lofty old trees laden with exuberant foliage. The interior, as already noticed, is of an oblong form, the pulpit being placed about the middle of the side wall, with a deep recess in front of it. Although the pewing is of plain pine, the pulpit, inclosing-rail of Kirk-session seat, and the finishings of the Hopetoun Gallery are of oak. The panelling of the pulpit and canopy above are neatly executed, the inclosure of the Kirk-session seat may have been the remains of the altar-rail when the church was used as an Episcopal place of worship. It consists of a large base with massive balusters connected at the top by small arches, which support a broad moulded cope. There is some very effective carving upon the Hopetoun Gallery, which, with the fittings described, appears to belong to the 17th century. A peculiar arrangement is connected with the Hopetoun Gallery. There is an outer lobby from which the gallery and a retiring-room enter; from the retiring-room there is a small well-lighted chamber with a fireplace and an opening in the church-wall, through which the preacher may be seen and heard, an invalid or other occupant may also join in the services without being exposed to draughts or other inconvenience. This may be said to be an elaboration of the earlier Hagioscope. In the lobby there is also the shaft of an ancient Celtic cross, which was discovered in 1841 when removing an outbuilding attached to the church. It is now carefully cleaned and set up, and also suggests the course to be followed, should any similar object be discovered. In the churchyard there is a long gravestone of triangular section, with a longitudinal rising curve turned up slightly at the ends and finished upon the sides with rows of overlapping scales. Similar stones exist in other parts of Scotland and also in England. They have been suggested to be of Scandinavian origin; but the form appears rather to have been suggested from the covering of the ancient Bier, and which ultimately developed into the rigid Mediæval copestone.

The next place visited was Hopetoun House, which was occupied, but the party were kindly shown around the exterior. It is a magnificent palatial building in the Italian style, consisting of a centre and wings extending forward. The centre was erected about 1700, from a design by Sir William Bruce, the architect for the restoration of Holyrood Palace, and the wings were added in the end of last century from designs by William Adam, father of Robert Adam, who was architect for Edinburgh University. The gardens are extensive and well arranged. On leaving, attention was directed to several large and interesting specimens of pinetrees, and to the remains of the ancient castle of Abercorn, which was taken and demolished by James II. in 1455 during the Douglas wars.

After resting and partaking of a substantial dinner at the old Hawes Inn, in South Queensferry, the time remaining was devoted to a short visit to the Norman parish church of Dalmeny, of unknown date; but the name of the parson appears as a witness to Charter about the middle of the 12th century. All then returned homeward highly gratified with the day's excursion, and the admirable arrangements made by their president.

NOTES FROM EDINBURGH.

THE past six months have been very quiet for the building as for other trades here—nor are there as yet any hopeful symptoms of improvement for the immediate future. A fair amount of work, speculative and other, has been always on hand, and the transactions of the Dean of Guild Court show that the work of projected alterations on old property is considerable. In George-street, a good deal has been done in this way. The large tenement, long-familiar to the public as Veitch's private hotel, has been converted into a range of handsome shops on ground-floor, and with capabilities for business premises of any sort above. The process of destruction has been going on in the Warriston

Park, which has been converted into a sand quarry, most of the fine trees having fallen before the speculator's axe. Judging from a specimen of architecture already erected in the street—the altitude of a four-story tenement would alone be enough to damage the character of this fair approach to the city; and it is to be feared that the architectural proportions and details will not be better than the very tame and tasteless monotony of door and bay-window repetition, which now represents the *ne plus ultra* of the speculative builder's ideal. The best thing done on a large scale for improvement in the way of architecture in the city is the stately entrance to Drumshengle-gardens, which is now externally complete. It is designed in a centre block with wings, each frontage at a convenient angle for turning the corner. The proportions are lofty, and all the details of the style, which is Italian of a simple order, are effectively varied. The ground-floor comprises a very commodious range of shop-fronts, and the usual extravagant amount of plate-glass and slender iron-work, as yet with nothing attractive behind them as compensation for the inconsistency.

The University Extension has made a good stride towards completion of its exterior, notwithstanding four months of protracted winter weather in the spring. The principal facade in Lauriston-street is nearly ready for its roof. This portion consists of three floors, having the great entrance near the middle. The tower and hall which complete this and the eastern frontage will occupy a considerable space. But, as it is, the portion now nearly completed has a character of its own distinct from that of any other frontage, and yet in good harmony with the rest. The lights on the basement are massive and square-headed. The range of windows over these are equidistant and similar lofty circular-headed lights, the voussoirs having the outline of the pointed arch flush with the chiselled surface of the wall. The upper lights are also of a character novel in these parts, and probably not common anywhere. These are also circular-headed, but more of decorative detail is given; and they comprise each two circular-headed window-lights, separated by a substantial pillar with its Composite capital. The stone tympanum above is pierced with one large circle, and the blank spaces left at the shoulders are also pierced into minute interstices. Round each member of the decorative sub-divisions referred to, and in the sides of the window are cut a series of delicate lines of a very flat ovolo moulding, so that the eye can hardly observe any of the usual recession of the subordinate members of construction. The effect is in strong contrast with the arcaded windows of the other frontage, and would be somewhat monotonous and uneffective at a distance, were it not for the design of the entrance, which is carried boldly through all the stories, and is finished with a massive segmental pediment. This frontage is further enriched with a band of sculpture on low relief, and which will make it in this way more interesting than the usual treatment of Italian. The interior arrangements will take a year or two for their completion, and possibly by that time ways and means for giving a prospect of completing the edifice may be forthcoming.

Another notable feature, which will arrest the attention of the visitor to the city, is the rising tower of Free St. George's Church, which has now reached the stage when the ornamental portion is begun. Hitherto it has been only a square ashlar tower, with the usual pilaster projections at each angle. The church itself is not a bright specimen either of church-architecture or church-planning. The best thing about the interior is the coved plaster roofing and the pulpit. The exterior is heavy, and the entrance far too small, the vestibule dark and dismal. The design of the principal front, indeed, seems to have been made entirely for the erection of the tower, at first designed for it, the weight of whose sub-structure threatened at one time to disintegrate the structure, and which, by the cruel irony of fate, is not to be erected after all. The design now being carried out is much lighter and loftier, and will probably be the best thing about the edifice. Though not quite in keeping with the Italian below—having a good deal of the Gothic Campanile about it apparently—it will form a striking effective contrast to its neighbours, the spire of St. Mary's and the dome of St. George's Church. It forms also a good termination to the vista of Princes-street, and will be seen everywhere as a very striking feature of the city architecture, where it is no easy matter to distinguish other spires and towers than those already mentioned.

The subscriptions for the restoration of St. Giles' were at one time so backward that parties in charge seemed to have become despondent. Since that period others have generously devoted themselves to the object, and a guarantee for the balance of the £10,500 required has been given to enable the congregation of West St. Giles's to vacate the edifice in 1882. But in order to allow the work to be forthwith begun, Dr. Chambers has purchased an iron church for use of the congregation, so that in a few weeks, at most, a commencement will be made. The plans and specifications have been already submitted to the Town-council. So far as it has gone, in choir and south transept, the restoration has been carried out with great respect for the preservation of all that could possibly be preserved as characteristic of the original interior. The work has been most successfully done under most tantalising difficulties, occasioned by the liberties taken by Mr. Burn, in 1829, with the stone piers and the southern portion of the building generally. Externally, two of Mr. Burn's doors (those at east and west end of the south transept aisles) have been built up. But in the western doorway another and smaller doorway has been made, for use of the judges and as an exit. This doorway is the best now in the edifice, with much more of design in it than any of the Perpendicular and larger doorways by Mr. Burn, and which are all singularly inconsistent with the character of the tracery and everything else around them that had any resemblance to the original. The restoration has brought back to its pristine beauty the fine ground-work of the southern aisles, and has added another aisle by including as portion of the church the mutilated portion of a much larger projection left by Mr. Burn, but made into a gallery staircase.

The work remaining to be done upon the nave and its aisles, including a curious projection known as the Albany aisle, will not be beset by so many doubts and difficulties as to method of procedure, but it will involve some heavy work. The walling, which now fills up three of the lofty pier-arches of the great central tower, was removed when the Collegiate Church became a Cathedral, and there is no reason to suppose that the process cannot be repeated. The great door (constructed as western entrance in 1829) will be put to its proper use, and the spectator from that point may calculate upon having, before very long, the full length of the edifice (nearly 200ft.) and its lateral aisles displayed in their true proportions and proper architectural design. The whole expense of this work, as of the southern portion of the building, has been undertaken by Dr. Chambers, whose historical sketch of St. Giles, recently published, will afford ample information, with many interesting illustrations, for any anxious to know more about a Gothic building so very different from other churches of this country.

THE PRESENT STATE OF THE SEWAGE QUESTION.

AT the monthly meeting of the Sanitary Institute of Great Britain, held at 9, Conduit-street, W., on Tuesday evening, an address was delivered by Professor W. H. Corfield, M.A., M.D., on "The Present State of the Sewage Question." Dr. Alfred Carpenter, of Croydon, occupied the chair. That the removal of refuse matters was a highly important matter for consideration was very evident, the lecturer thought, from the fact that wherever a district had a slow system of removal or none at all, the death-rate was very high, and just in proportion as the removal was expedited the number of deaths and cases of enteric disease decreased. The results of the non-removal of refuse matters was shown by the spread of black death, Oriental plague, cholera, and enteric fever. The entire depopulation of many ancient cities was, he believed, due to the injurious effects of the accumulation of filth. Having pointed out that utilisation, though no doubt important, was a secondary matter, and indeed was what an athlete would call "a very bad second," the reader of the paper proceeded to consider the systems of sewage removal and treatment at present in use under the two heads of conservancy systems and water-carriage. In the former,—which might have been so named by their bitterest opponents, instead of the title being one adopted by their advocates, as the very object of the sanitarian was "removal," not "conservation,"—the refuse matters were either collected unmixed with anything else, or mixed with ashes, earth, &c. The first of these plans was now being adopted in several large towns, as Birmingham, Rochdale, &c., and it might be said to be the only successful one among the conservancy systems. It was certainly the only one from which a profit had been obtained; the manure in all the other plans was nearly valueless, and the results obtained by the Sewage Committee of the British Association showed that the earth compost, after having been used in the closets six times, was only as rich as a good garden-soil, and would not bear the cost of carriage. The total manurial value of human excreta had been estimated at 7s. 3d. per year for the liquid refuse, and 1s. 3d. per year for solids, but all chemical analyses of manures placed their value at a higher rate by about one-half than they possessed to a farmer. A summary was given of the results obtained by the conservancy systems, in which they were shown not to be solutions of the questions, especially as they leave the liquid sewage still to be treated, but in which it was admitted that under certain circumstances, as where it was necessary to reduce the bulk of the sewage, they might with proper precautions be adopted. The recent improvements had been in the direction of reducing the size of the receptacles, so that they had to be removed at shorter intervals, in making them watertight, and in ventilating them. The interest of a local authority, and still more of its contractors, was to empty the pails as seldom as possible—a radically bad principle. The water-carriage system was considered somewhat in detail; its advantages in the continuous removal of refuse from houses pointed out, its disadvantages shown not to be inherent in the system, but to be mistakes made in carrying it out, as for instances, sewers pervious to water, or too large, or not ventilated, or without sufficient fall, or with a blocked outlet, or discharging into rivers, house-draining not properly disconnected. The folly of turning surface-water, and, in many instances, even springs and streams into sewers, and so increasing the difficulty of dealing with the sewage at the outfall was insisted on. The various chemical processes for the treatment of sewage were passed in review, and all shown to be quite inadequate to cope with the difficulty, though some might be useful as preliminary aids to purification. Filtration through soil and wide irrigation were next treated at some length, and the results obtained by them described. Certainly the sewage had been satisfactorily purified in many cases, the conditions for satisfactory purification in winter being that the sewage pass through the soil and not merely over it. Crops of all kinds had been grown by means of it, and in soil that would otherwise bear nothing; and the British Association's Sewage Committee had shown at Britton's farm, Romford, during five years' daily investigation and analysis, that as great a percentage of the manurial constituents, 33 per cent., of nitrogenous compounds had been utilised as was on an average utilised of the best commercial manure. Although, for various reasons, it had seldom been found to be remunerative, the reader adhered to his opinion, formulated ten years ago, that sewage irrigation would ultimately be remunerative in many instances, and that opinion was shared by the committee appointed by the Local Government Board in 1876 to inquire into modes of treating town sewage. An irrigation farm should be supplemented by a filter-bed to receive and purify sewage when it is not wanted on the farm. The supposed dangers from the proximity of such farms, or from the spread of entozoic disease, were found to be purely imaginary; it was on the whole a better solution of the question for a large number of places than any other, and if, as was very likely, we had a series of dry years, its adoption would receive a great impulse. Where towns could not make sewage utilisation pay, they must be content to be taxed to a slight extent to get rid of a most serious nuisance, and to secure a low death-rate.

A short discussion followed, in which Messrs. Sillar advocated the Aylesbury precipitation process, in which he was, he said, pecuniarily interested; Mr. Douglas Onslow, managing director of the Coventry sewage-purification works, defended the operations there carried

out; Mr. Bailey Denton, jun., spoke of the intermittent downward filtration works carried out for many years past by his father; Mr. R. W. P. Birch agreed with the lecturer, that no fine line should be drawn between irrigation and intermittent filtration, but that on the sewage farm both plans should be adopted as the season demanded; Mr. Jeumain described Lord Warwick's sewage farm at Leamington, and asserted that sludge had a manurial value; and Mr. Thos. Wilson Grindle suggested that as Hillé's system, which he was carrying out at Edmonton, was practically the same as the Aylesbury and Coventry processes, a conference should be convened to arrive at an amalgamation of the several sewage companies.

The Chairman said this was attempted at the Leamington congress 16 years since without any result. A long experience in the working of the Croydon sewage farm, which was situated in a somewhat densely populated area, had shown him that this was the best means of sewage disposal, and that it was absolutely no nuisance or danger to the neighbourhood. Forty tons of vegetables could exhaust the manurial qualities imparted to land by irrigation with 5,000 tons of sewage, so that its fertilising properties had been overrated. The practical difficulty was to get an intelligent farmer to occupy such a farm under so changing and occasionally so arbitrary and ill-informed a body as a "local authority."

Dr. Corfield replied upon the discussion, ridiculing the notion that any plan of "fortifying" sewage could pay. Doubtless sand could be made to pay for carriage and treatment if gold dust were sprinkled over it; but no one would assert that the enrichment with gold dust, to be subsequently extracted, was a remunerative or wise enterprise. The simile held good with all additions to sewage; the stuff itself was worth, on a favourable computation, about 2d. per ton, and the cheapest chemicals that could be added to it would not make the compound worth carriage, plus their original cost to the farmer. A vote of thanks was passed to the lecturer on the motion of Mr. Rogers Field and Professor Symons.

"BUILDING NEWS" DESIGNING CLUB.

A DAIRY FARM.

AS we expected, few members have ventured to try their hands on this subject, possibly from a feeling that it was one requiring special knowledge and experience. The designs we have received, however, display fairly arranged plans, though not so thoroughly worked out in detail as we should have liked to have seen. (1). "Per" seems to us to have hit upon the simplest general plan. The cow-house occupies the centre, and has a double row of stalls, with centre tram-line for feeding, in direct communication with the food-preparing shed at the end. The calving-houses are placed conveniently at the other end, and the cow-house is flanked by open sheds and open yards on each side, inclosed at the extreme sides by piggeries on the left hand and cart-horse stables on the right hand. The range of shed in line with food-preparing house is occupied by poultry-house, infirmary, chaff-house, waggon-shed, and implement-store. A steam-boiler and a hay-store form a projection at the back. The house is not so well planned, and its connection is not shown. The author of this design has at last given a suitable character to the buildings which, as may be gathered, form an ⊓ shaped or double quadrangle, and are symmetrically disposed. No section is shown, and the ventilation of cowhouse is defective if the louvre ventilating cupola is the only means. An isometric view accompanies the plan, and the timber-and-brick treatment is simple. (2) "Beta." This is a similar and decidedly good plan, the double-byred cow-house in the centre and the yards on each side, half covered and half open, with feeding-troughs, are desirable points. The cart, root, and implement sheds inclose the block on the north side, and the stable and piggeries form respectively the extreme wings which come forward and protect the yards. The sections show the cow-house and covered yard portions roofed with iron principals and tie-rods, and the general grouping of the buildings is effective. The dairy is not so good, and the house is designed in a rather uncharacteristic style for the farm buildings. (3) "Jack" has also a plan of merit. The combination of covered and open yards is useful: the cow-house forms a long single range for 25 cows, with a feeding-passage behind. The calving-house, sick-house, and fowls' form one wing, and the cart-horse stable the other wing, inclosing the covered yard. The mixing-room, with granary over, the root-house, and straw-barn, and boiling-house are parallel to and behind the cow-house, and the piggeries and cart-shed form two other blocks inclosing an open yard at the end. The whole plan forms a parallelogram. The dairy is well arranged; it is placed opposite the feeding-passage, and has a milk-room and cheese-pressing-room adjoining, with its own yard. The external treatment is brickwork, unpretending in style, with plain mullioned windows and dark brick ornamentation. (4) "Pupil J." is a clever compact plan. There is an openyard 29ft. by 28ft., and a covered yard, 34ft. by 27ft., in communication; the cows are arranged in two rows, with a centre passage, and the food-house is placed at one end with the piggeries and boiling-house in convenient proximity. A roadway separates the dairy and house from the farm buildings, and these are arranged in a rather disorderly though picturesque fashion. Generally, the details of plan have been considered; but the design is spoilt by the irregularity in the grouping and in the roofing. There is too much attempt at the picturesque, though we can quite appreciate the author's entrance, and there is knowledge of the details of farm arrangement. (5) "Ephraim" is a neatly-drawn plan with some desirable points, as the partially-covered yard for young cattle, and the compact arrangement of food-shed. The calf-houses are well placed, and have two openings; and the dairy and house are planned in convenient proximity to the cow-house. The sections show ventilating louvres over cow-house. (6) "Black and White." This is a plan showing the cow-sheds at right angles forming two sides of an open square yard; but the barn is poorly placed in relation thereto; and the feeding arrangements are not perfect. The dairy is too far off, and proper conveniences are not indicated. (7) "Vignette's" plan is at least compact; the yard, inclosed by the buildings, 70ft. by 35ft., is partly covered, and the feeding-passages are well disposed; but the details of the design are not up to the mark. (8) "Bonus Hominus" is a neatly-drawn design. There are two covered sheds running parallel with the cow-house; the food-preparing shed and granary over is convenient, and tramways communicate from it to the cow-house and pig-sties. The house and dairy are fairly planned, and economy and good ventilation secured by iron roofs with louvred ventilators on the ridges. The style is commonplace, and the author, unfortunately, has not endeavoured to impart picturesqueness to the grouping of his buildings. (9) "Ambition" is not quite so compact; the piggeries are inconvenient as regards the food-house, and the details are scarcely worked out satisfactorily. The style also is too ambitious, and the position and appearance of house strangely out of keeping. "Walter H." is even less economical as to area; the yards, partly covered, are too large; the "shippon" or cow-house, and the stables form the side-wings of buildings; the food-preparing house is placed at one angle; and though the plan exhibits knowledge, the scheme is not the kind we had in view for a small dairy farm. "Hubert" shows a more modest and simply grouped farmstead; but the details of plan and the perspective might have been improved.

STRENGTH OF WROUGHT-IRON COLUMNS.

IN a paper published in the *Proceedings* of the Engineers' Club of Philadelphia, Mr. Thomas M. Cleemann discusses the formula adopted by Rankine for "built up" columns of wrought iron. In applying this formula to experiments on several different sections used by American manufacturers, the constants f and a did not seem to be constant. Mr. Cleemann says: "If we examine the formula critically, we see that f is the limit of the breaking-strain per square inch, as l decreases to zero. It should then be constant for the same material for all shapes. At first, it seems, from Rankine's theoretical deduction in his 'Applied Mechanics,' that a should likewise be constant for all shapes, as he assumes. It appears probable, however, that his statement that the greatest deflection consistent with safety is proportional to the square of the length and inversely to the square of the least radius of gyration is not sufficient, but that there should likewise be included the least diameter." The writer proceeds to explain how he found that strength depends also on least diameter, and publishes a table, from which it is seen the values of a differ widely; but the values of f do not vary much, and Rankine's value of 36,000 is sufficiently accurate. The author thinks that a may, perhaps, be found to be some function of the least diameter or of the length divided by the least diameter. "Other things being equal, that column will be the strongest in which a is least; and this would point to the Phœnix Iron Company's column as being the strongest of those noted." This section is a cylinder in four segments. Rankine's formula is the following:—

$$P = \frac{f \quad S}{1 + \frac{al^2}{r^2}}$$

in which P is the breaking-load; S the cross-section; l the length; r the least radius of gyration and f and a are the constants mentioned.

DAMP WALLS.

CONSTANT complaints are made by correspondents and others in reference to damp walls, and we are being repeatedly asked for some remedy. It may not be uninteresting to refer to the table published in "Notes on Building Construction," by the Science and Art Department, which gives the absorbing capacity of different kinds of brick and stone. From this instructive table, if we can accept its authority, the percentage of water absorbed by some bricks is remarkably large, thus "malm best seconds," which weigh when dry 5lb. 1½oz., absorb 20 per cent. of water, while malm hard paviors absorb 9½. Malm bright stocks take up 22 per cent. of moisture. Common grey stocks, weighing 5lb. when dry, absorb 10½ per cent., and hard ones 7½. The highest percentage of absorption is 22, as in "malm cutters" and "bright stocks" and "malm grizzles" and the smallest occurs in Staffordshire, "dressed blue," which absorb only 2·3 of water. Sandstones absorb from 8 to 20 per cent. of water, as compared with bulk of stone, and limestones also vary considerably in this particular, Bath absorbing as much as 17 per cent.; Chilmark, 8·6; Kentish rag only 1½, and Portland 13·5 per cent., though the absorption must not be taken as indicating the degree of durability of the stone, as Ketton is a durable stone, but absorbs more than a great many other stones of less durable character. These figures at least show the large absorption of most walls. Capt. Galton says, from a calculation of the moisture retained in new walls, chiefly from the new mortar used, nearly 100,000lb. of water, equal to 10,000 gallons, may be assumed to be put in the walls of a house in the process of building—i.e., in one containing 100,000 bricks, before it becomes habitable, and this moisture has to be removed by evaporation. Hence, heat is lost or absorbed by this process of evaporation from the surface. Speaking of drying such walls, the same author shows that the best method of effecting it is "by passing a large volume of air through it at a higher temperature, and therefore of a greater hygrometric capacity, than the outer air." These facts and figures are of immense importance to the architect, if he desires to make his buildings fit for habitation; yet it is strange to find houses and churches daily built solid and thick with porous bricks and stone, in spite of hollow walls and the concrete and slab materials manufactured, and which we have lately directed attention to in connection with a recent visit of the Association.

The annual meeting of the Somersetshire Archæological Society will be held at Clevedon this year, commencing on August 23rd. After the delivery of the opening address by Mr. E. H. Elton, Clevedon Court old church and rectory will be visited. On the Wednesday, an excursion will be made to Tickenhall, Wraxhall, Ashton, Flax Bourton, Cleveley, and Nailsea; and on the Thursday a visit will be made to Cadbury, Clapton, Portbury, Portishead, and Weston-in-Gordano.

OUR LITHOGRAPHIC ILLUSTRATIONS.

BURMANTOFTS FAIENCE AND WOODWORK.

Two of our double-page plates to-day are devoted to the illustration of some decorative faïence, made by Messrs. Wilcock and Co., of Leeds, and used with inclosing framework of wood. In both the two hall-fireplace designs here shown, as well as in the first dining-room mantel, a series of figure-panels are introduced, from the special designs of Mr. F. Hamilton Jackson, late of the Slade Schools. The first series illustrate instruments of music, including the organ, with the connecting subject of the blower for a corresponding panel on the other side of the fireplace. The second series includes the four seasons surrounding an heraldic panel, and the third design has for its subject the four winds, with the inscription of "East or West, Home's best" in the centre. Two of these last-named panels are illustrated on the detailed page of cartoons with another set giving "Science," "Literature," "Music," and "Painting," as a similar series to the four first described. Of these panels Science and Music are used at the ends, the faces of the figures turning towards the centre. The two enriched friezes to the hall fireplace designs are entirely in faïence. The dado panels are inclosed in wood framings. The various designs were made by Mr. Maurice B. Adams, A.R.I.B.A. The faïence is a delicate glazed ware, and the work is executed in quiet colours flatly treated.

ARCHBISHOP ABBOT'S HOSPITAL, GUILDFORD.

THIS excellent example of Jacobean work, a prominent feature in Guildford High-street, was founded in the year 1619 by Abbot, Archbishop of Canterbury, a native of Guildford, his father being a clothworker of the town. His object was to provide a home or hospital for decayed tradesmen. In plan it is quadrangular. The room over entrance-gateway is the dining-room, which is enriched with the portraits of Wycliffe, Fox, and others. The second-floor room is known historically as having been the temporary prison of the Duke of Monmouth on his way to London, after the battle of Sedgemoor (1661). On either side of "quad" are the apartments for the twelve brothers and eight sisters, and opposite the gates are the common hall and chapel; by ascending the principal stairs we come to the "long room." All these are extremely interesting—the chapel for its two pointed windows, its Flemish stained glass, old pews, and charmingly designed poor-box. This glass is probably earlier than the building, and was probably imported by the founder himself from the Low Countries. The common hall and "long room" are panelled up to the ceiling with dark oak, the common hall having a frieze of carved panels. Each possesses a good chimneypiece, particularly the "long room," while round the room are ranged a good supply of stools and benches. The large table in common hall is a very good one of the style, and similar in many respects to that one in the hall at Haddon. Of the external elevation a good idea may be gained from the drawing which we publish. The bricks used are small red ones, running about five to the foot. The copings are formed with large ridge-tiles laid on a projecting course of bricks; in the "quad" there are some good chimneys, similar to that one seen in drawing; and lastly, but well worth sketching, the many beautiful stack-pipe heads, which always help to give, in these old buildings, however humble, a sense of refinement and care, to the smallest details.—EDWIN G. HARDY.

THE WHYTE-MELVILLE MEMORIAL.

THIS memorial is erected in a central part of Market-street in St. Andrew's, where the thoroughfare is of unusual width. The stone used in the structure is principally Dumfries red sandstone, obtained from the well-known Corncockle quarries on the estate of Sir Alexander Jardine, Bart., Lockerbie, and while an agreeable warmth of colour is thus obtained, a telling effect of contrast is secured by the introduction of columns and copings of polished Dalbeattie granite. The lower basin of the fountain, which like the two higher, is of red sandstone, but has a granite coping and is approached by a step of the same material, measures 14ft. in diameter, and rises 3ft. 4in. above the ground. From the centre of this basin there rise a cluster of five granite columns, four of them, about 6in. in diameter, surrounding the fifth, which is, as it were, the bearing column, and it is 1½ft. in thickness. These shafts are surmounted by carved capitals of sandstone, which in turn support the second basin. On this basin, which is quatrefoil in plan, a great deal of work has been bestowed, the stone being elaborately carved in designs representing water-plants. The depth of water in lower basin is 1ft. 9in. to overflow. The water after passing through the pipes of the fountain, is conveyed to a flushing tank a few yards distant, and there used for flushing a section of the common sewers. On each face of the quatrefoil there is placed a medallion in white marble, one showing a bust in bas releif of the late Major Whyte-Melville, by Mr. J. E. Boehm, A.R.A., the second and third bearing respectively the family arms, and the shield of the Coldstream Guards, in which the deceased was an officer, and the fourth being occupied with the following inscription, the lettering being of lead inlaid: "This fountain is erected by many friends, rich and poor, to the beloved memory of George John Whyte Melville of Mount Melville, Bennochy and Strathkinness; born 19th July, 1821; died 5 December, 1879, from an accident in the hunting-field near Tetbury, Gloucestershire. His writings delighted; his conversation charmed and instructed; his life was an example to all who enjoyed his friendship, and who now mourn his untimely end." The third stage of the fountain is a reproduction of the second on a smaller scale, the arrangement of a basin supported by granite columns being repeated, with the variation that the columns in this case are octagonal. Above this there rises a moulded finial of red sandstone, carrying the fountain to the height of about 14ft. from the ground. Water will be discharged from gurgoyles, four of which are disposed round the second, and four round the third basin, as well as from five jets, four of which are on the second stage, while the fifth is concealed within the finial. The whole of the works have been executed by Mr. Thomas Earp, of Kennington, from the designs of Mr. Robert W. Edis, F.S.A., architect, of 14, Fitzroy-square. The local tradesmen employed were Mr. Hart, plumber; Mr. MacIntosh, builder; Mr. McPherson, plasterer; all of whom deserve credit for the manner in which their share of the work has been executed.

ST. MICHAEL'S CHURCH, CAMDEN TOWN, N.W.

THIS is a reproduction of the most important drawing by Messrs. Bodley and Garner on view at the present Academy Exhibition. It is a perspective of the west front and intended tower of the large church of St. Michael, now in course of erection at Camden-town. The style is that of the earlier part of the 14th century; brick is being used for the main structure, the piers, windows, and arches being of stone. The foundation-stone was laid on the 5th June of last year. We illustrated the interior from a drawing hung in the last Academy Exhibition on October 8, 1880.

ST. PETER'S HOSPITAL, COVENT GARDEN.

THIS hospital, which is devoted to the treatment of stone and diseases of the bladder, and has been established in Berners-street for the last 20 years, is having the new building, shown in our illustrations, erected in Henrietta-street, Covent Garden. It will contain 40 beds, besides accommodation for the out-patient department. The latter, together with the secretary's office, board-room, &c., is on the first floor; the principal wards being on the second floor. The kitchen, offices, smaller wards, and operating theatre are on the third floor, with the nurses' and servants' sleeping-rooms above. The principal entrance is in the centre, and the entrance for out-patients on the right. The building will be constructed in the most substantial manner; all the floors being fireproof on Messrs. Homan's system, and the greatest care has been taken to render its sanitary condition as perfect as possible. It is also the earnest desire of the committee to impart to the new hospital more of the special character which has hitherto distinguished their present house, viz., a *Home* for the sick, such as may recommend it to patients whose means may be small, but whose position in life is somewhat higher than the class usually admitted into hospitals. The general front of the building is in red brick, some portions, such as the entrance doorways, and the base plinth and cornice of ground-floor being in Portland stone. The total cost will be about £15,000; the general contract has been taken by Messrs Patrick and Son, builders, of Westminster Bridge-road. Special attention has also been given to the warming and ventilating, which will be carried out by Mr. D. O. Boyd, of Maddox-street; and the carving in brick and stone will be executed by Mr. Aumonier. The building is being erected from the designs and under the superintendence of Mr. J. M. Brydon, F.R.I.B.A., of 5, Cambridge-place, Regent's Park. The exterior view is taken from the drawing now in the Royal Academy, and the entrance hall will give some idea of how it is proposed to carry out the style internally, in the endeavour to secure the home-like character considered so desirable.

STAIRCASE HALL AT ST. CLOUD, PARIS.

THIS illustration is taken from a drawing now hanging in the Royal Academy (No. 1044), and shows the staircase-hall in one of three houses about to be built at St. Cloud, Paris. A small elevation of the building itself also hangs near (No. 1038). From the bay window, shown on right hand, also from the windows of principal rooms, a magnificent view of Paris and the Seine Valley is obtained. The fitted woodwork throughout and part of the furniture will be of oak, and in conjunction with the decoration, lead, glass, wood, and soft goods will be executed and supplied by Messrs. W. Homan and Son, of 60, Berners-street, W., from special designs by myself; and the metal-work throughout, furniture, and fittings will be supplied by Messrs. Faraday and Son, of 3, Berners-street, W., also from drawings made for the purpose.—THEODORE A. HOWARD.

CAMPANILE AT CREMONA.

THE sketch of the Campanile of Cremona is from a water-colour made in July, 1876. Want of time prevented my sketching more of it, and it loses much from the lower part not being shown. It is called "Il Torrazzo," and is said to be the highest campanile in Italy, 397ft. The upper stages were coloured pink and white, which did not improve the effect. The square part is a splendid rich red brick, its natural colour, all putlog holes left as usual. The battlements pointed in the centre, just the opposite way to the Verona and Mantua ones. There is some fine brick detail in the Duomo to which this campanile is attached, and Cremona is interesting altogether; but for more details I must refer those interested to Street's "North Italy."—PHILIP J. MARVIN.

NETHER COURT

Is about to be built for Mr. Henry T. Tubbs, from the designs of Messrs. Coutts and Percy Stone, architects. The materials used are red bricks with stone dressings. The external elevation is modified Jacobean, and the internal arrangements are adapted to the requirements of the present time. The illustration is taken from a drawing in the present exhibition at the Royal Academy.

A FIREPLACE, BY WALTER HENSMAN.

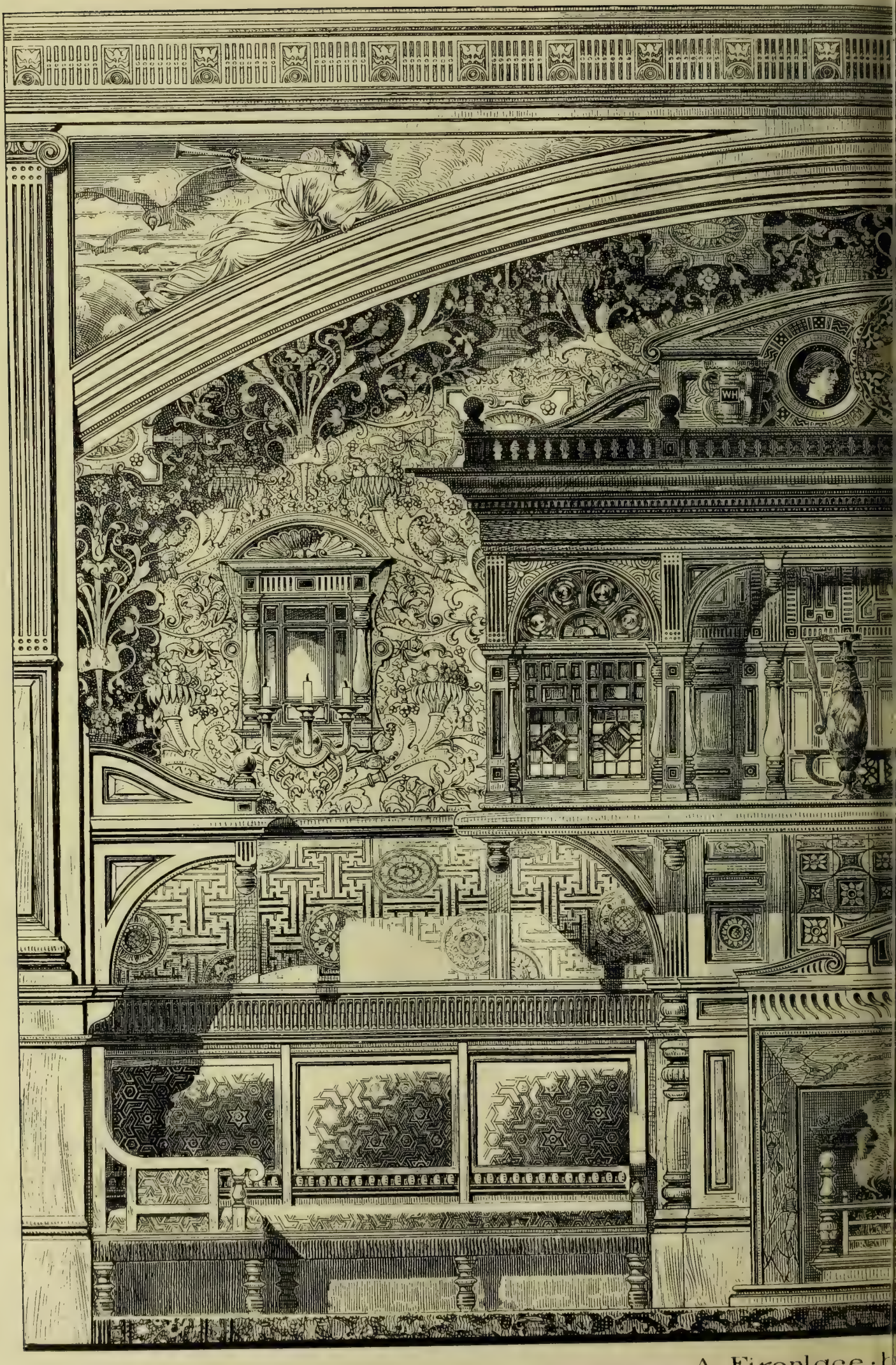
THE illustration given in the present number is a reproduction of one of the drawings now being shown at the new exhibition of decorative art, 103, New Bond-street.

OFFICES, CRANBROOK.

THIS building, which was completed last autumn, was designed with a twofold purpose: firstly, to be used as solicitors' offices—at the same time so planned that with the addition of a kitchen and scullery, built out by the side of the strong-room, it could be easily converted into a private house at any future time. It is built of red bricks; the walls on the ground-floor being hollow, the upper portion being all weather-tiled. The porch forms a striking feature, and is panelled to a height of 5ft.; all the woodwork is oak, with a tiled floor. The rooms over the strong-room and lavatories are entered off the half-landing. The first floor in front overhangs 1ft., thus increasing the size of the rooms very considerably. The outside staircase leads up to the caretaker's rooms; the living-room, being over the strong room, can also be entered off the half-landing. The building stands well back from the road, and has a garden front and back. The original drawing now in the Academy was designed by Mr. W. West Neve.

MISSION CHURCH, LEWISHAM.

THIS church is now in course of erection in the Algernon-road, Lewisham, from the designs of Mr. James Brooks, architect. The drawing from which our plate is taken is shown in this year's Royal Academy Exhibition.



A · Fireplace · h

JUN 24. 1881.

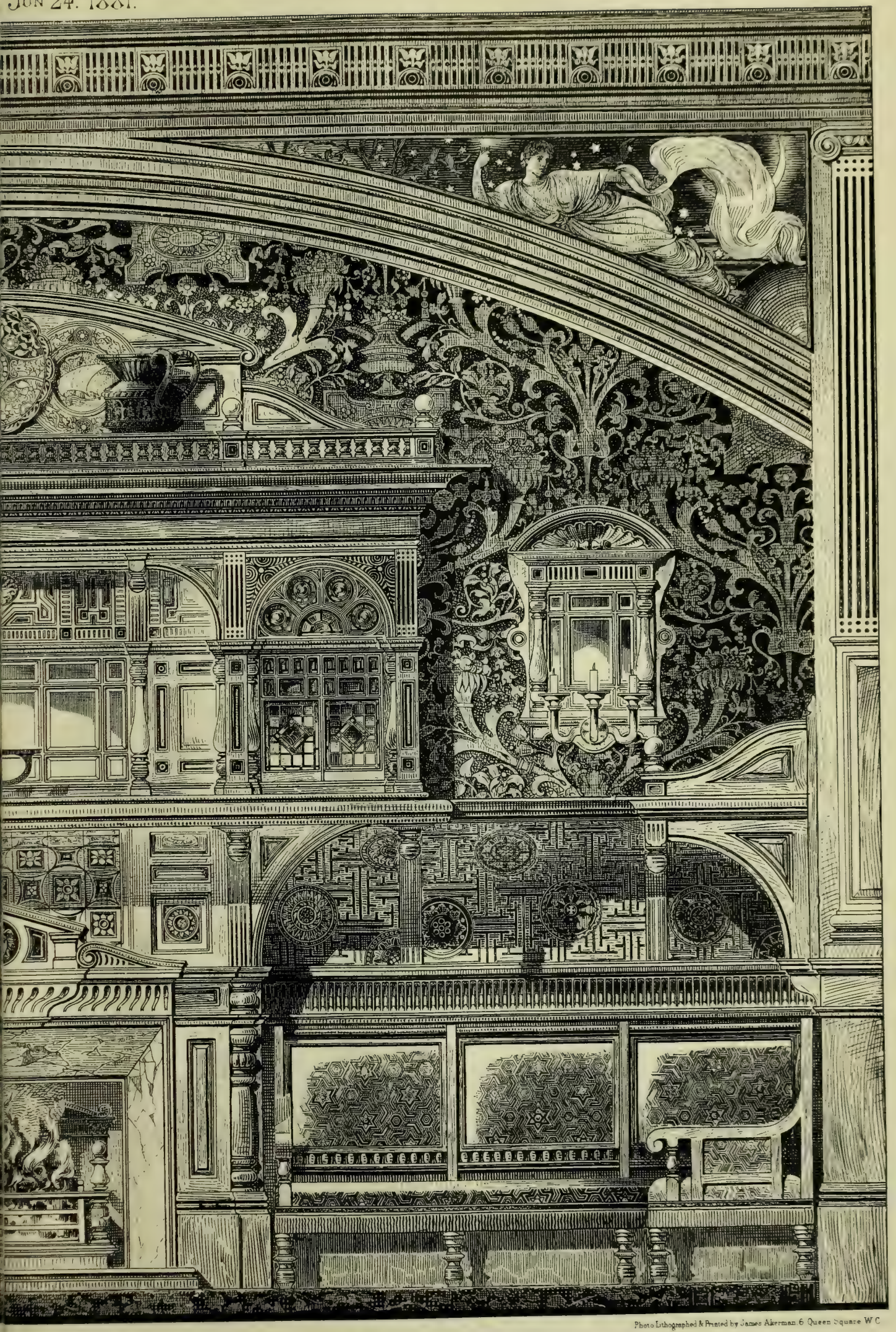


Photo Lithographed & Printed by James Akerman 6 Queen Square W C

Walter·Hensman·

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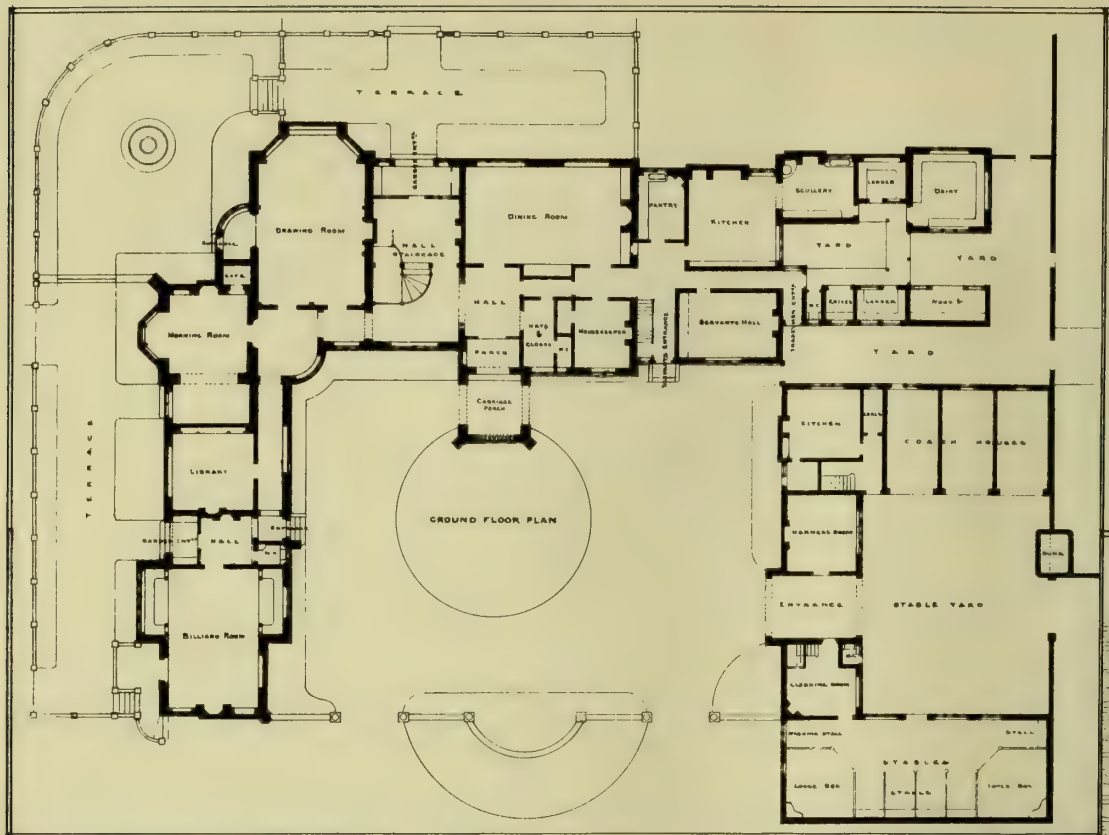

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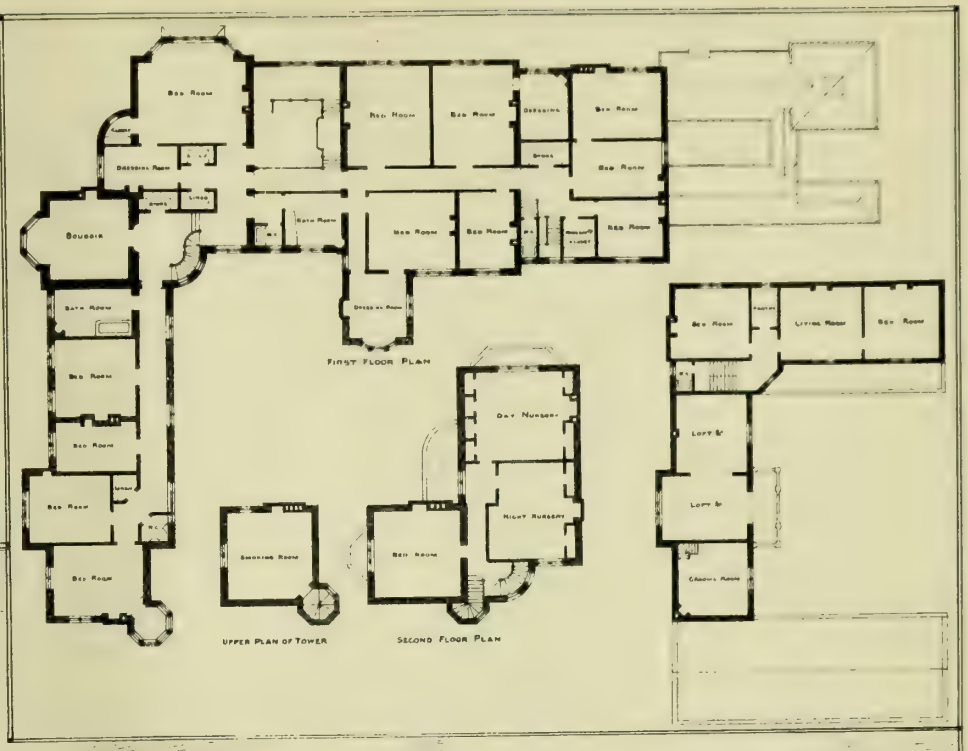
...IRT HENDON.

...ESQRE

COUTTS STONE

PERCY STONE

ARCHITECTS



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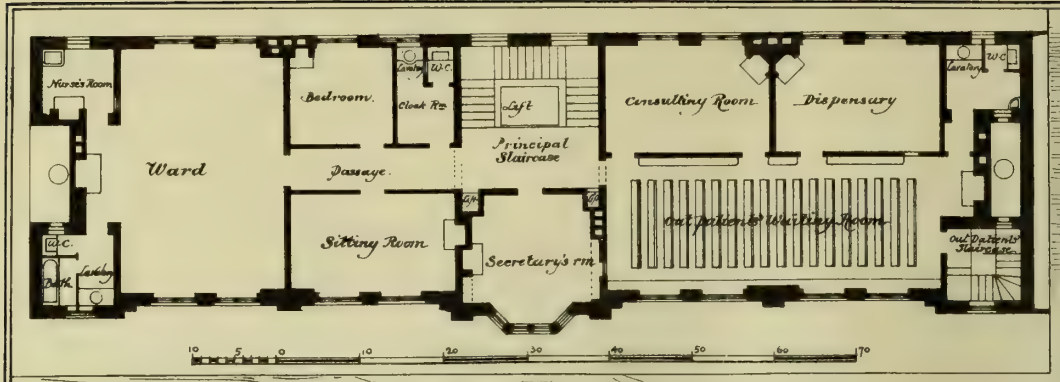
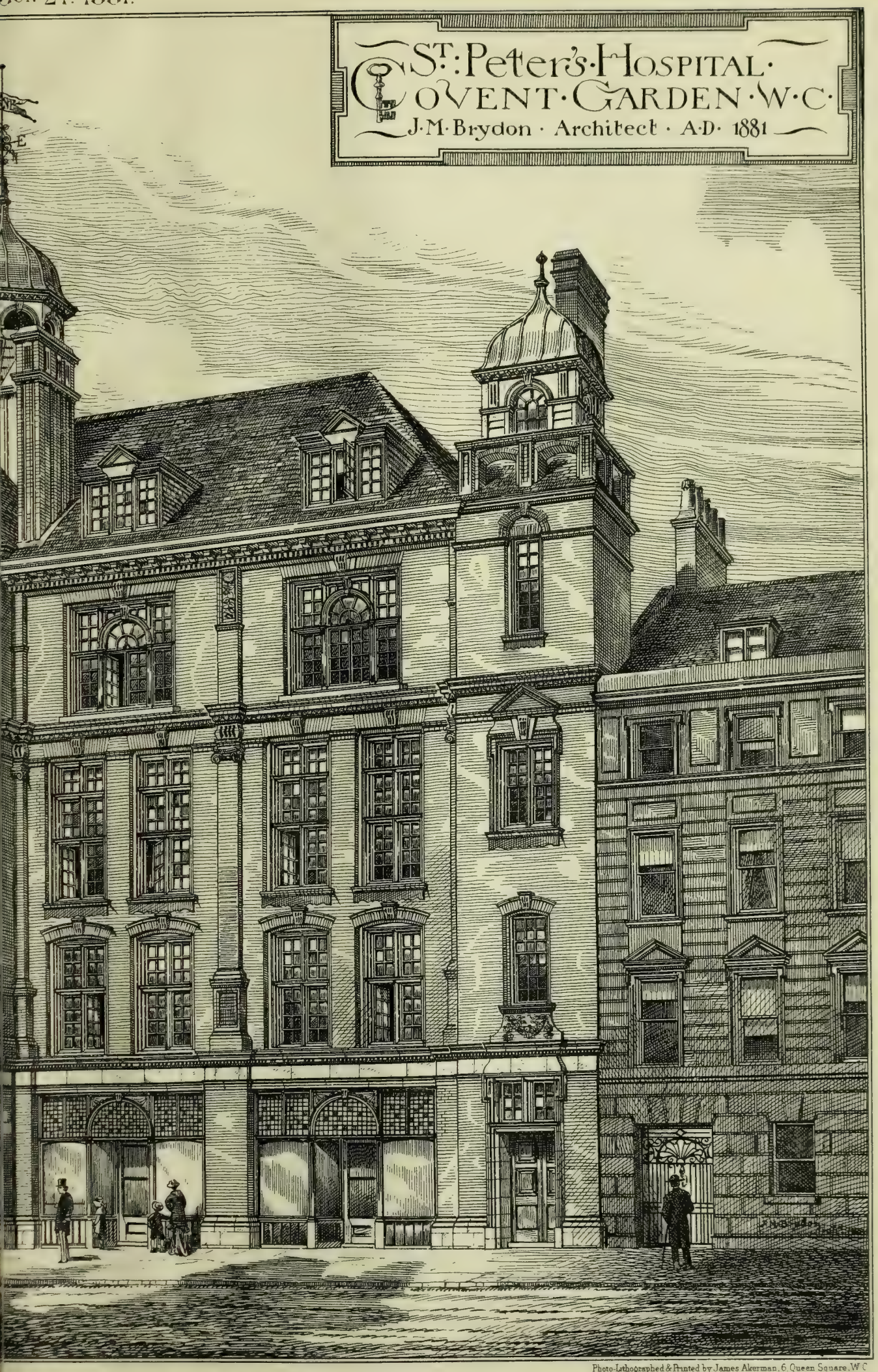

Nurse's Room
Bedroom.
Cloak Rm
Lift
Principal Staircase
Consulting Room
Dispensary
Ward
Passage
Sitting Room
Secretary's rm
Out Patients' Waiting Room
W.C.
Lobby
Bath
Out Patients' Staircase
10 5 0 10 20 30 40 50 60 70

ST. PETER'S HOSPITAL
COVENT GARDEN W.C.

J.M. Brydon · Architect · A.D. 1881



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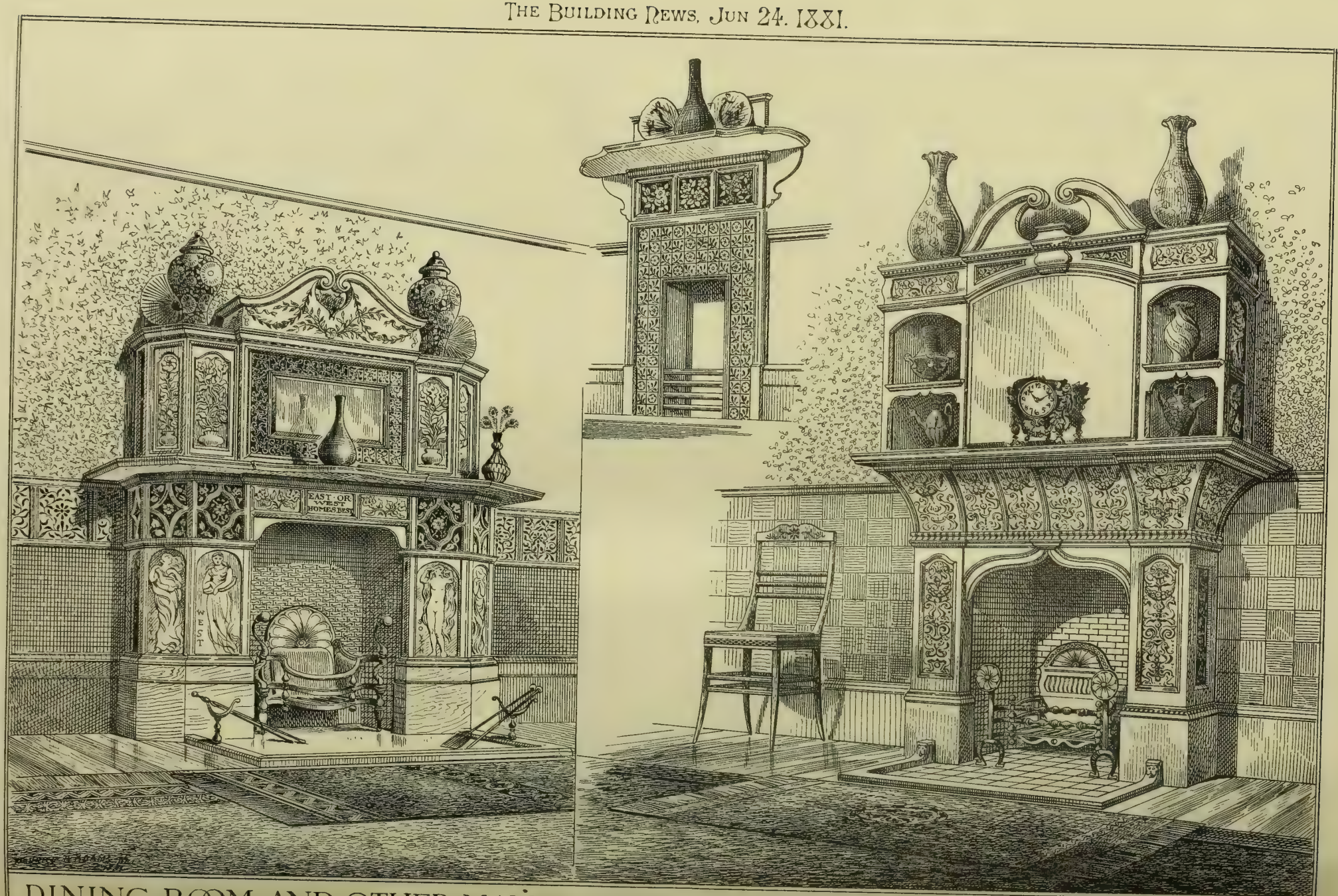
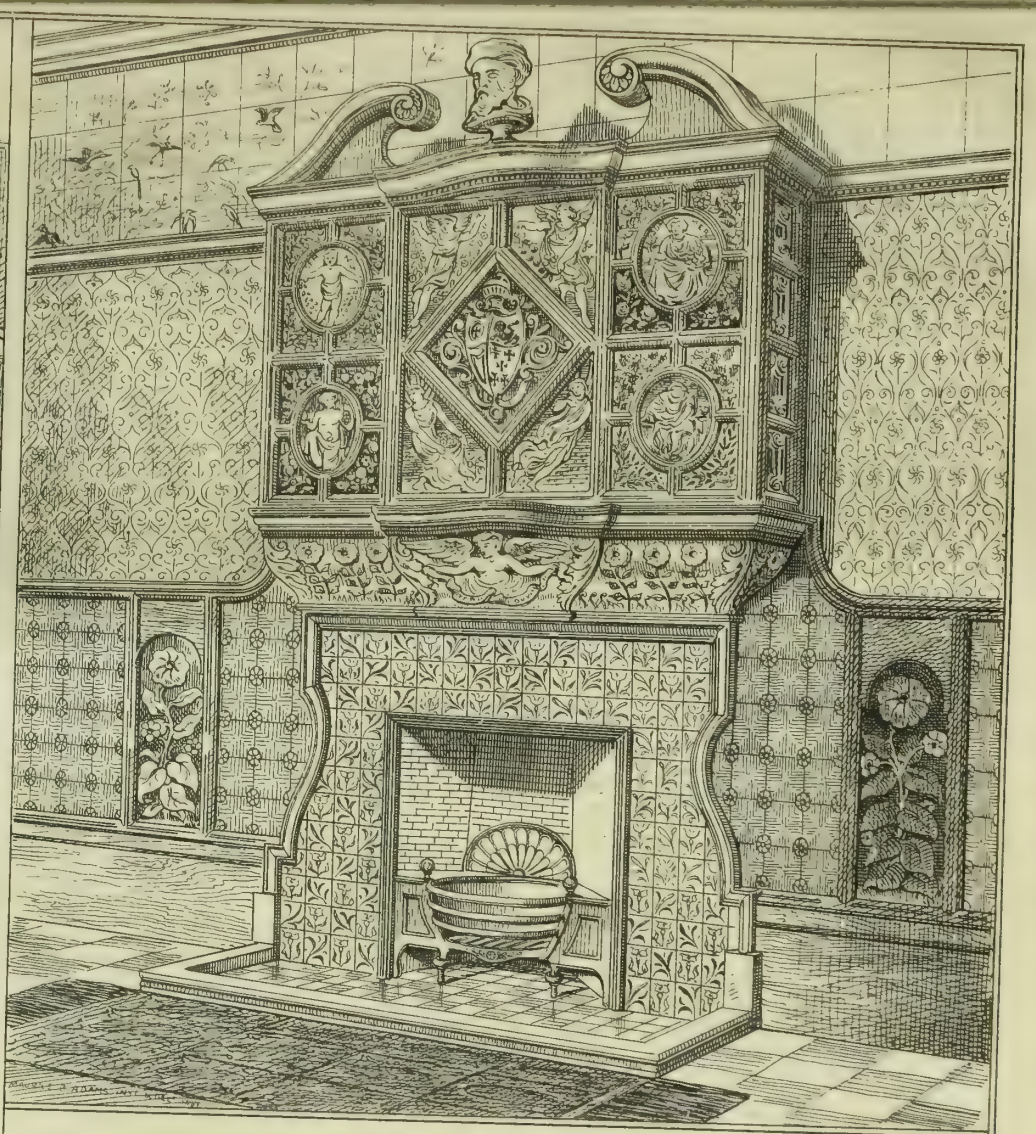


DINING·ROOM·AND·OTHER·MANTEL·PIECES·IN·BURMANTOFTS·FAÏENCE·&·WOOD·
AS·MADE·BY·WILCOCK·AND·COMPANY·LEEDS·FROM·DESIGNS·BY·MAURICE B. ADAMS. A.R.I.B.A. ARCHITECT



"BURMANTOFTS FAIENCE" AND WOODWORK

MANUFACTURED BY **WILCOCK & Co LEEDS** FROM DESIGNS BY **MAURICE B. ADAMS A.R.I.B.A.** ARCHITECT.

FIGURE PANELS ILLUSTRATE THE ART OF MUSIC. BY T. HAMILTON JACKSON

A HALL FIRE-PLACE AND DADO

A HALL or GARDEN-ROOM FIRE PLACE AND DADO

NOTE: THE PANEL SUBJECTS ILLUSTRATE THE SEASONS

Photo Lithographed & Printed by James Akerman 6 Queen Square W.C

SCIENCE

LITERATVRE

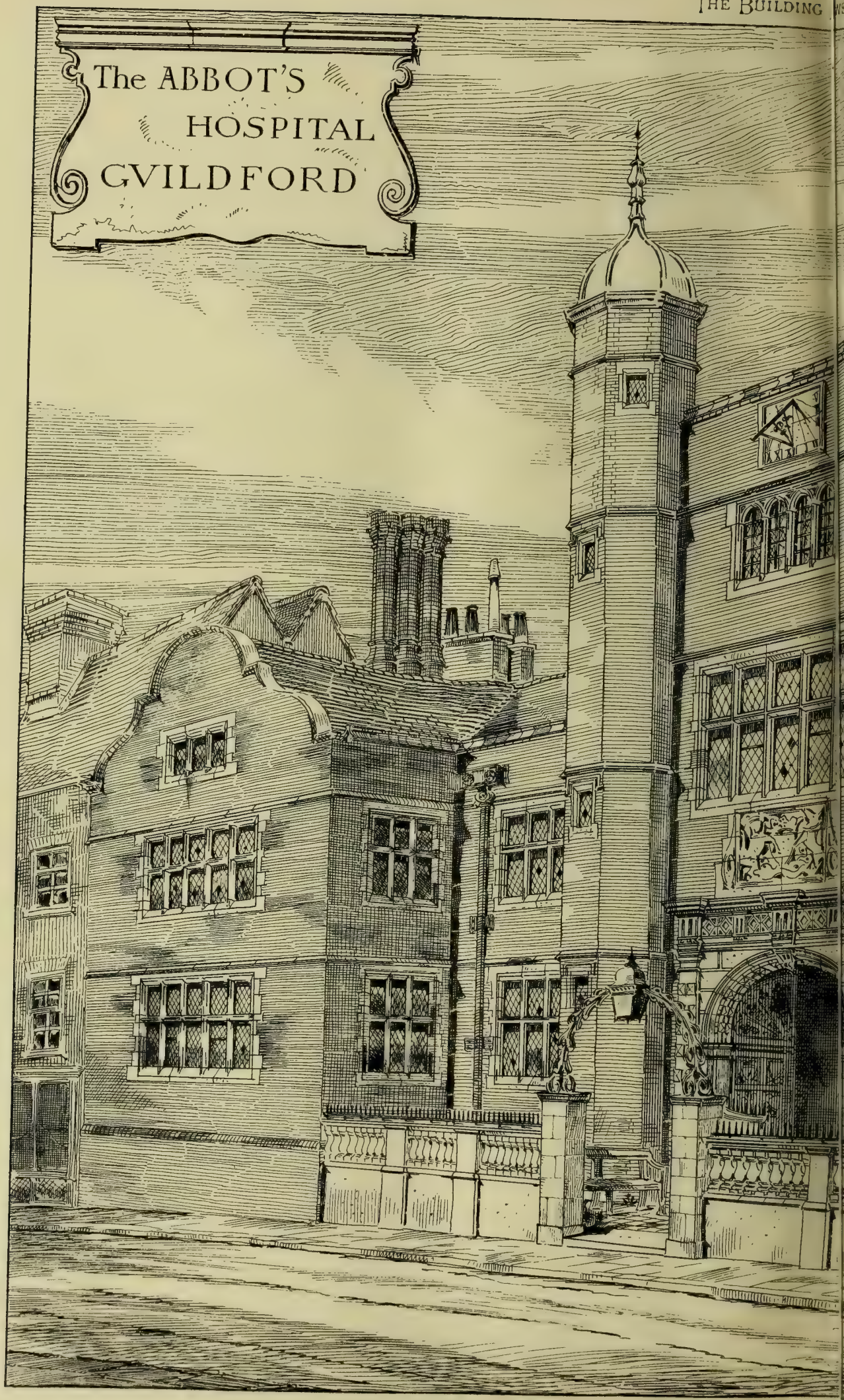
MVSIC

Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

DECORATIVE · FIGVRE · PANELS · IN · BVRMANTOFTS · FAÏENCE ·

DESIGNED · BY · F · HAMILTON · JACKSON ·

(SEE · MANTEL-PIECES · ILLVSTRATED · ON · THE · OTHER · PAGE ·)


The ABBOT'S
HOSPITAL
GVILDFORD

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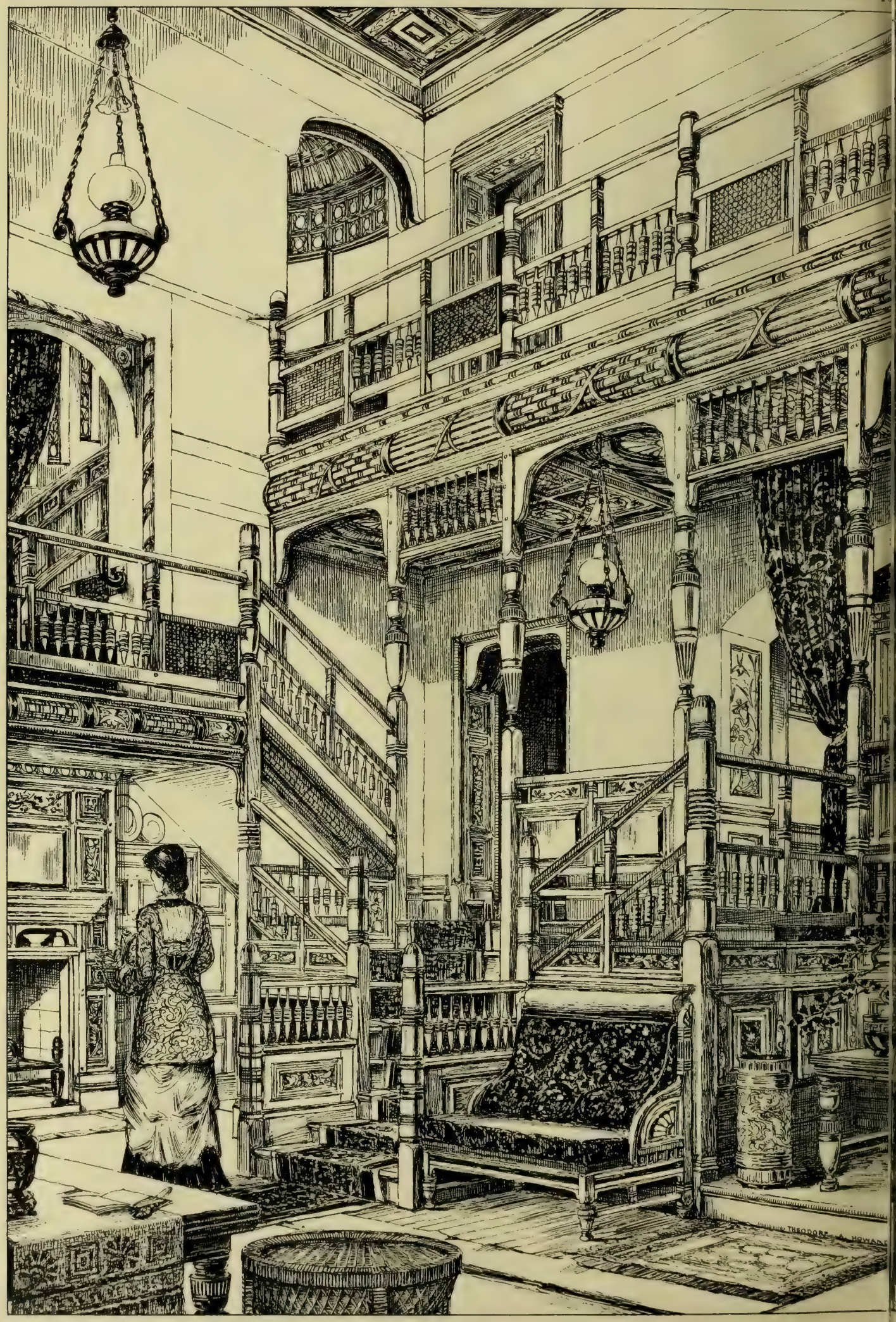
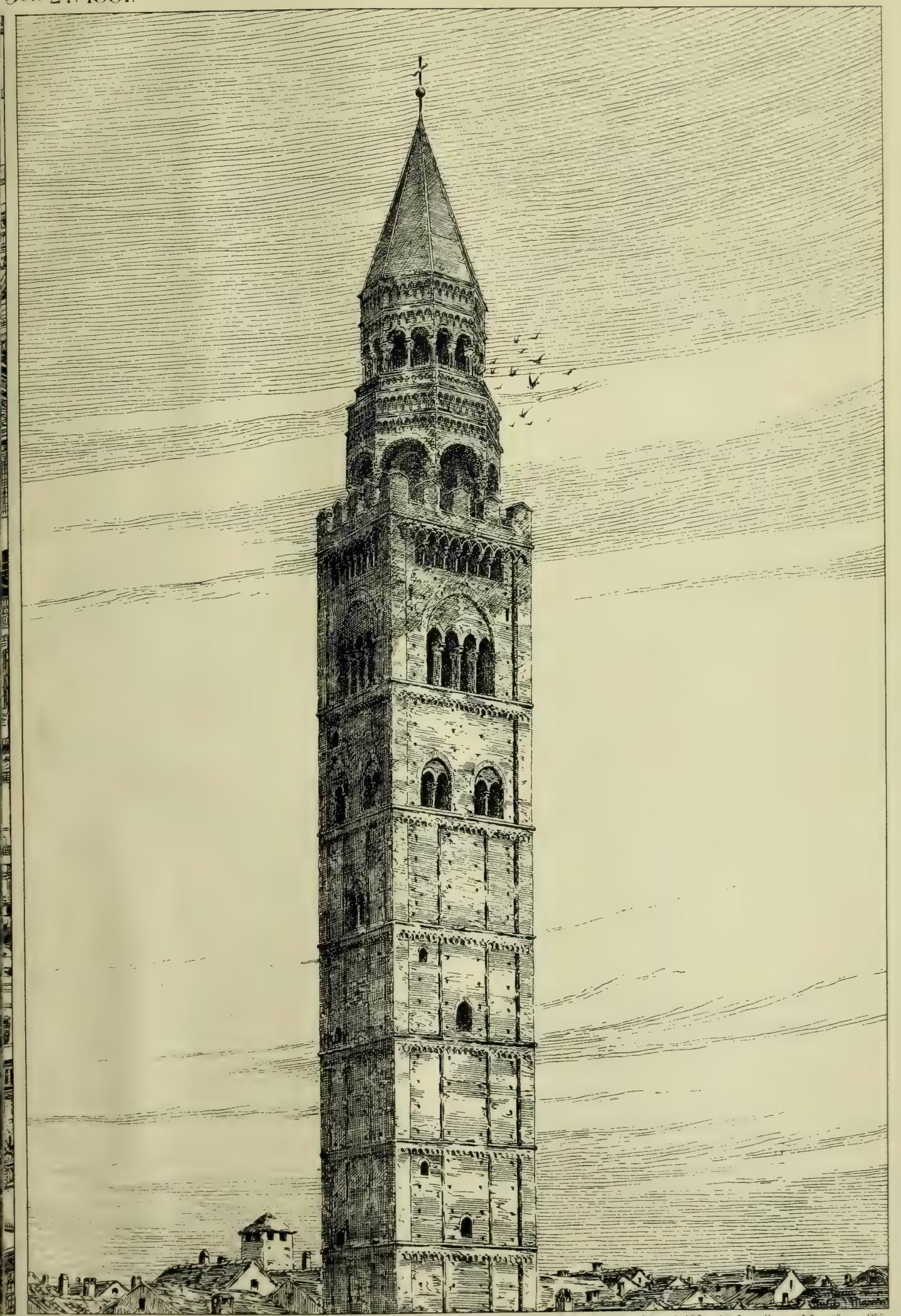


STAIRCASE · HALL · IN · HOVSE : S · CLOVD · PARIS ·

JUN 24. 1881.



DRAWN BY P.J.MARVIN

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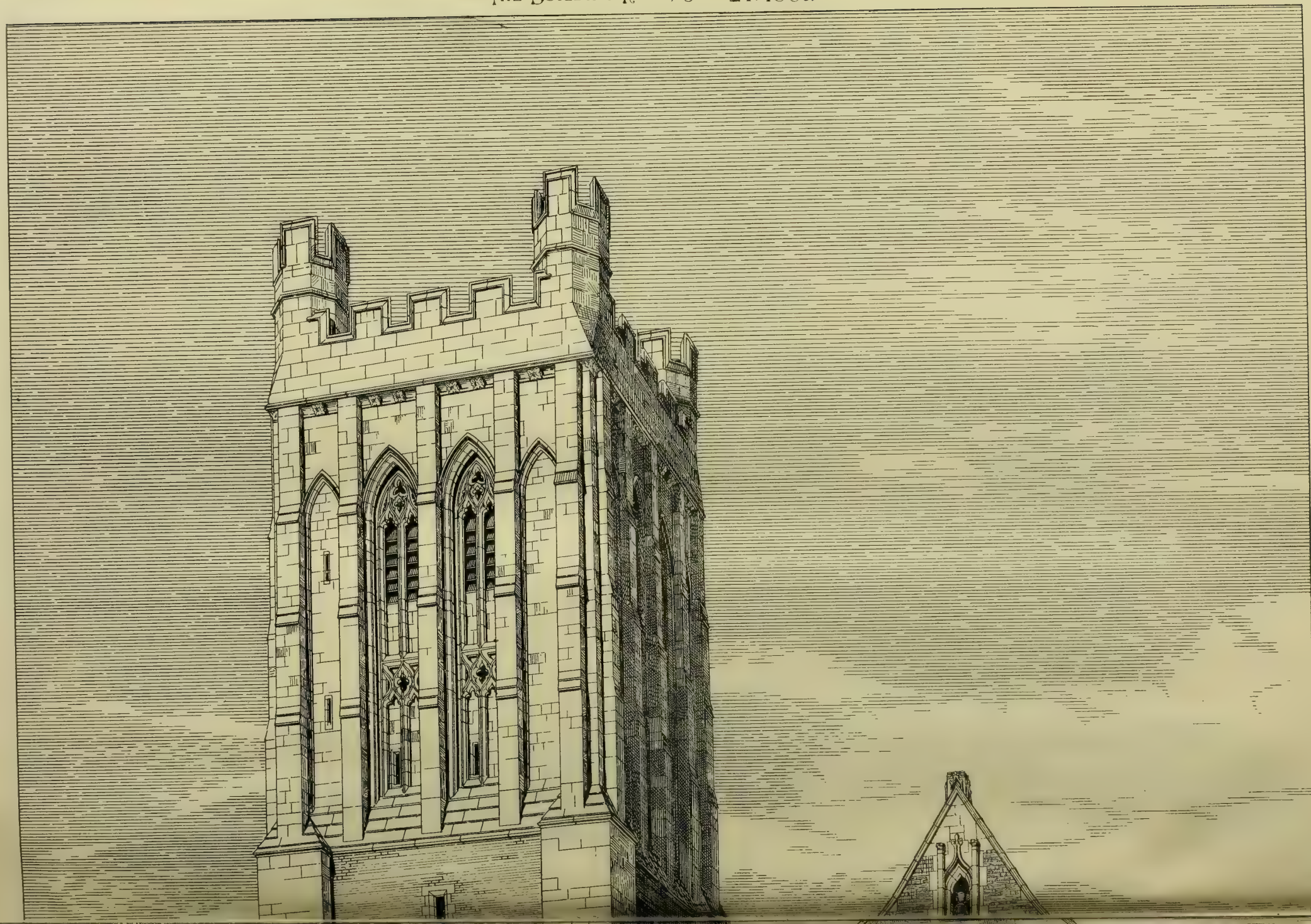
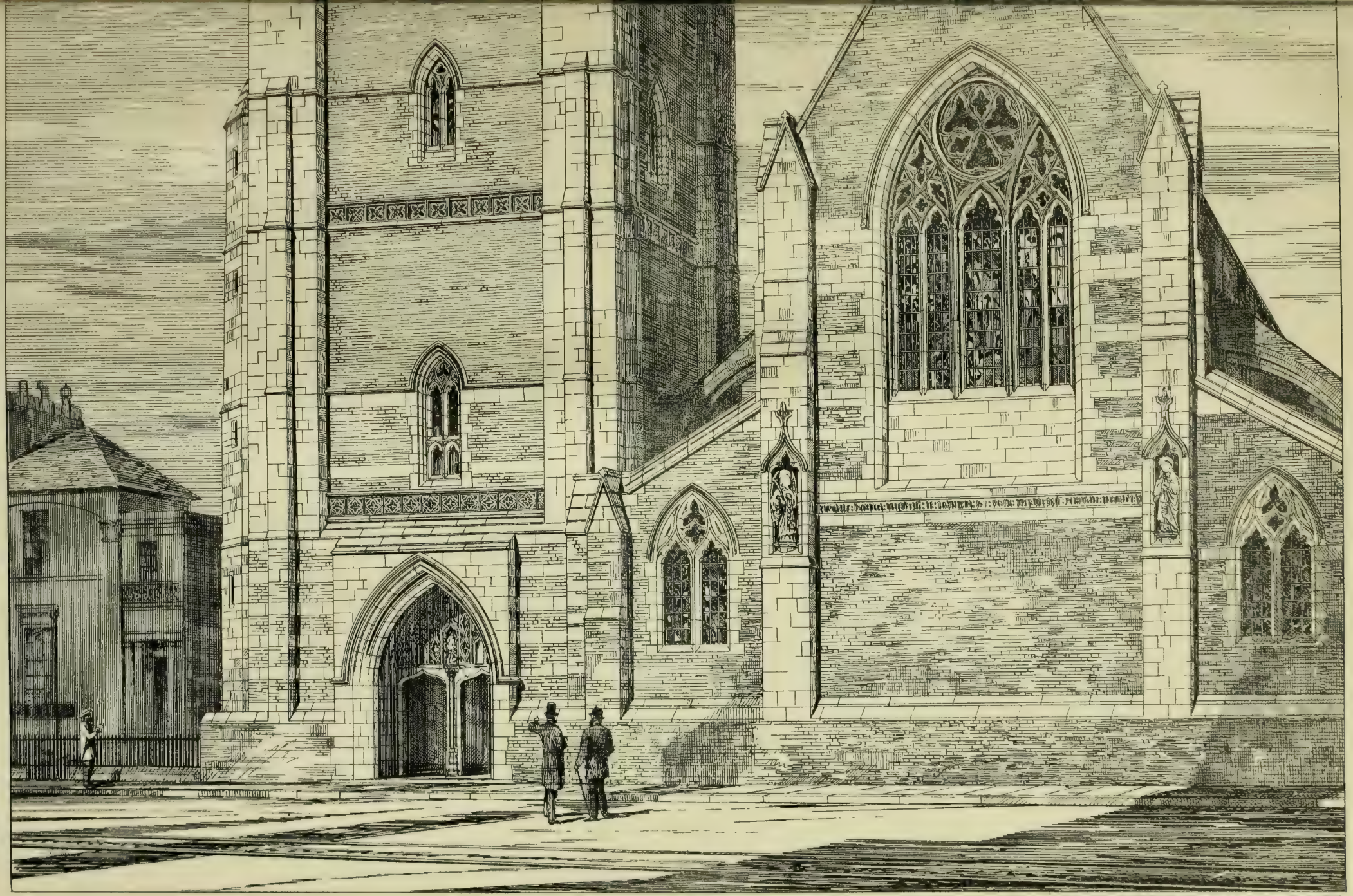
CREMONA





S. MICHAEL'S CHURCH CAMDEN TOWN

BODLEY AND GARNER ARCHITECTS

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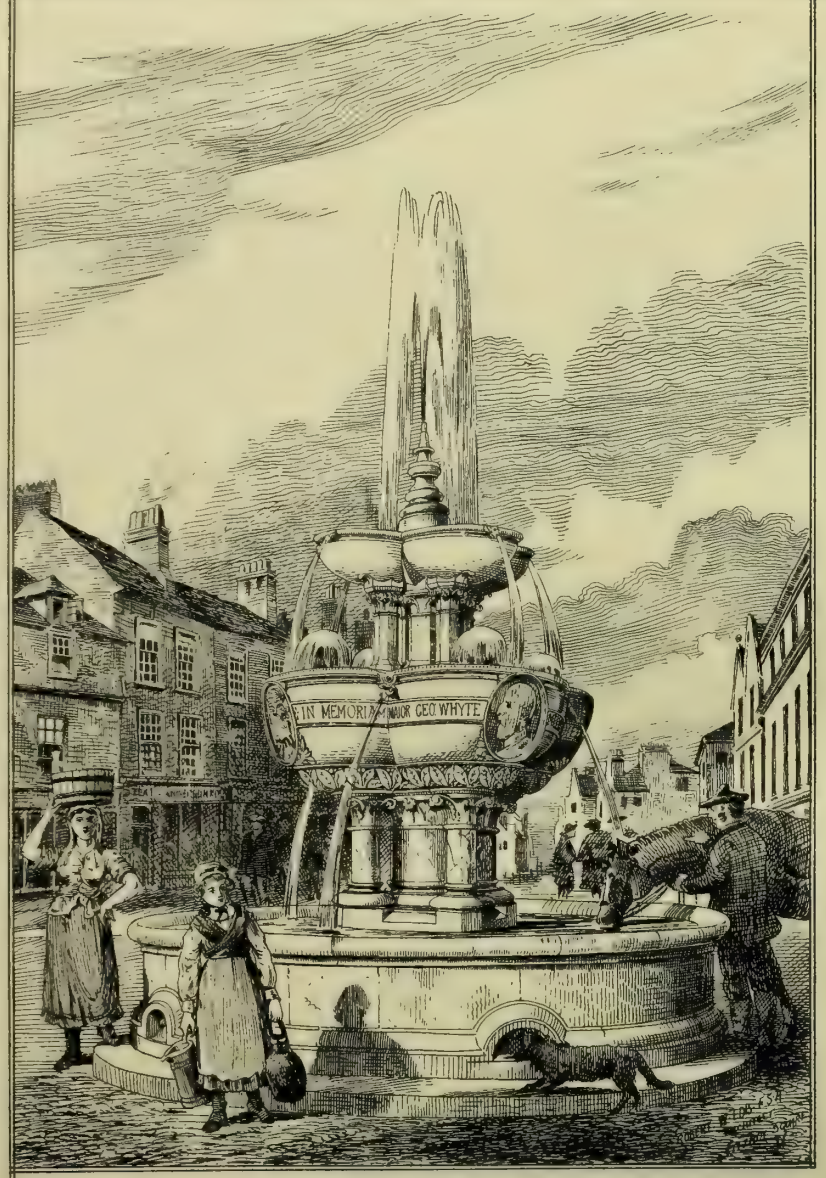
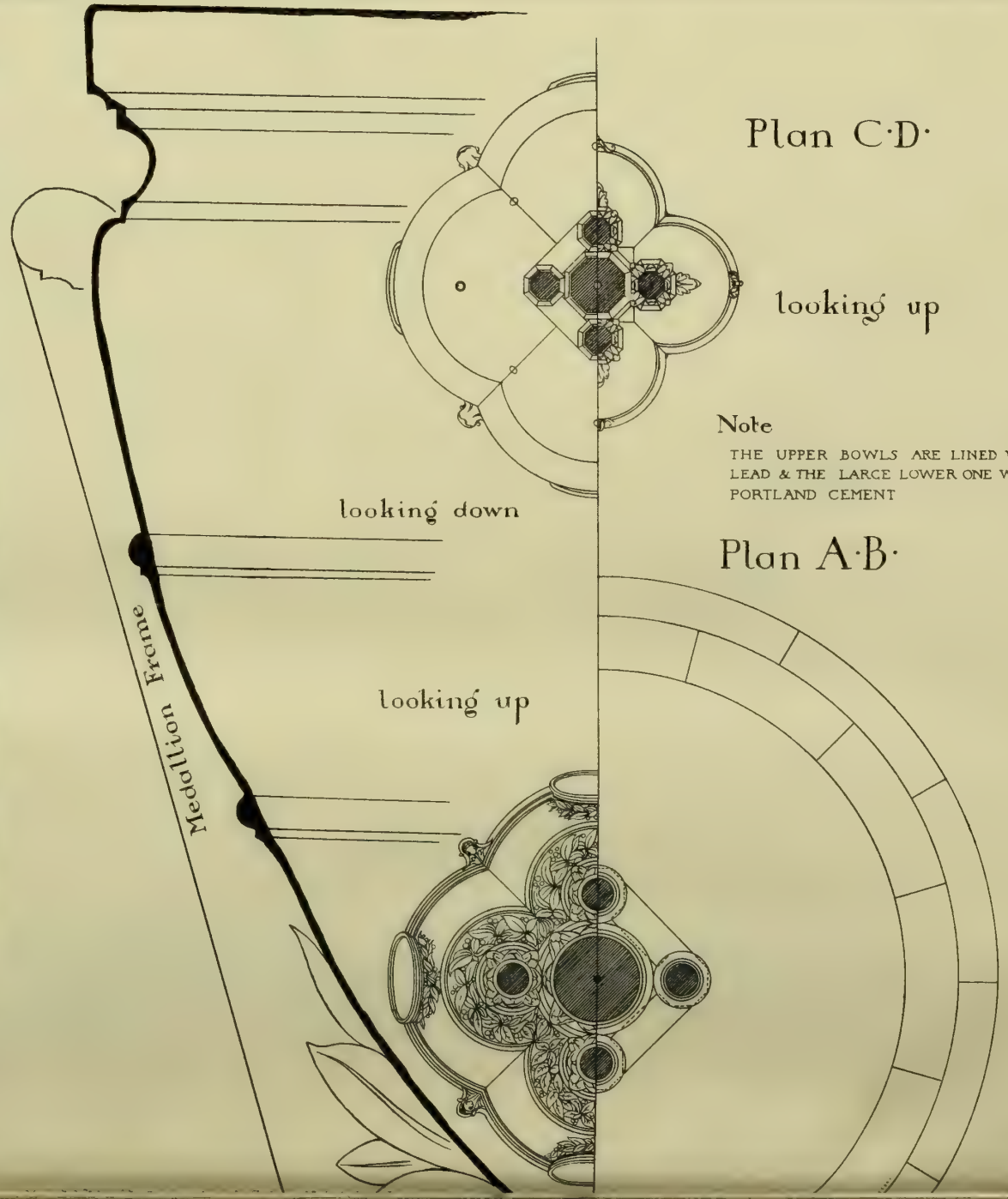

IN MEMORIA
MAJOR GEO WHYTE

View


Plan C·D·
looking up
Note
THE UPPER BOWLS ARE LINED WITH LEAD & THE LARGE LOWER ONE WITH PORTLAND CEMENT
looking down
Plan A·B·
Medallion Frame
looking up

Memorial·Fountain·St·Andrews·N.B·in·memory·of·Major·Geo·Whyte·Melville·

MAURICE B ADAMS DELT

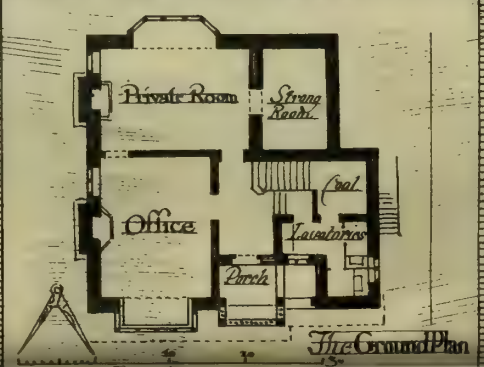
Photo Lithographed & Printed by James Akerman 6 Queen Square W

OFFICES: CRANBROOK:

for

Messrs Philpott & Wood:

W. Wallace Neve Architect.



The Ground Plan

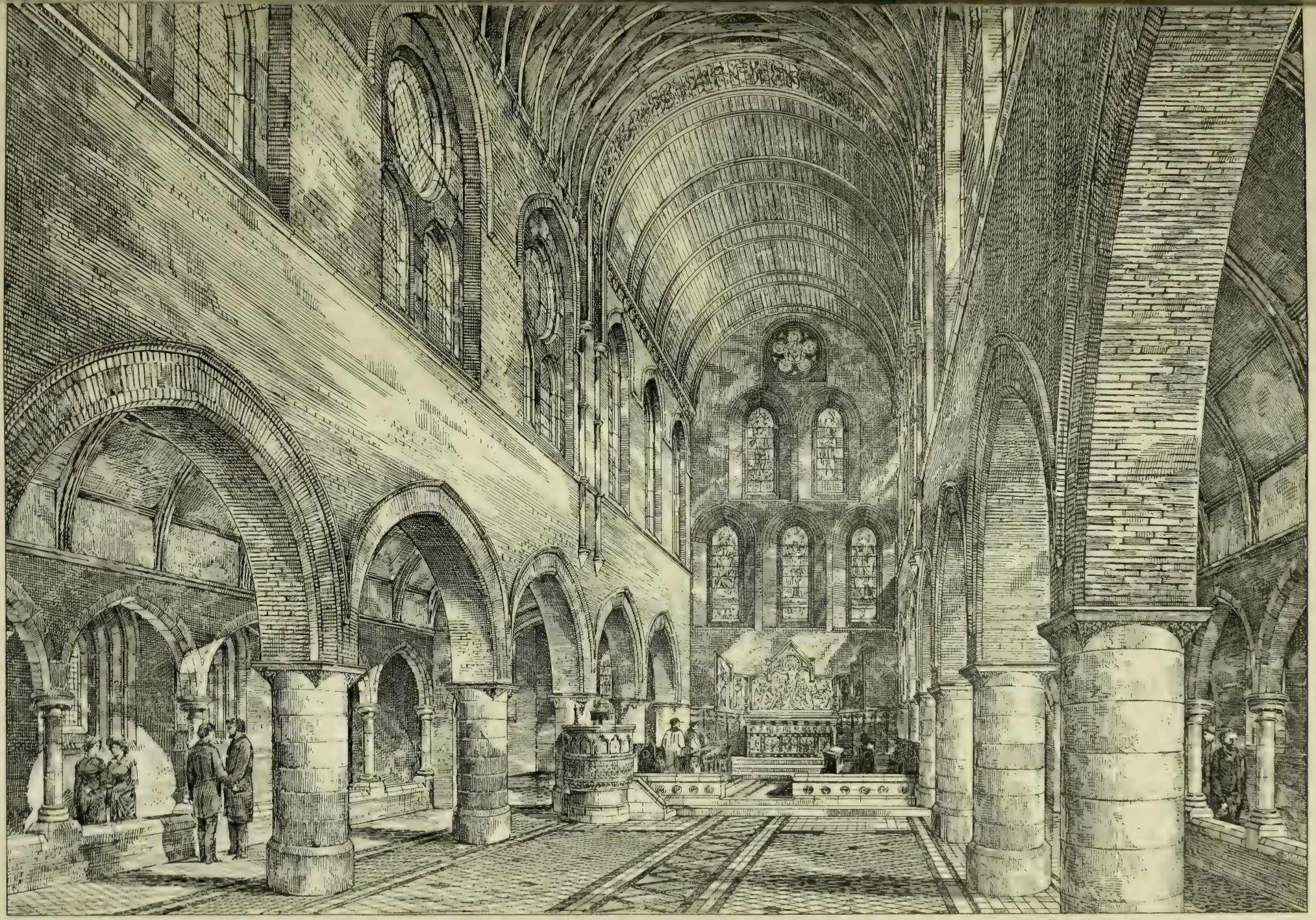


Photo Lithographed & Printed by James Akerman 6 Queen Square W.C.

LEWISHAM MISSION CHURCH, ALGERNON ROAD. JAMES BROOKS, ARCHITECT

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ILLUSTRATIONS.

MANTELPIECES IN BURMANTOFTS FAIENCE AND WOOD.—DECORATIVE FIGURES IN BURMANTOFTS FAIENCE.—ABBOT'S HOSPITAL, GUILDFORD.—THE WHYTE-MELVILLE MEMORIAL FOUNTAIN.—ST. MICHAEL'S CHURCH, CAMDEN-TOWN.—ST. PETER'S HOSPITAL, COVENT-GARDEN.—STAIRCASE AND HALL AT ST. CLOUD.—CAMPANILE AT CREMONA.—NETHER COURT, HENDON.—A FIREPLACE.—OFFICES AT CRANBROOK.—LEWISHAM MISSION CHURCH.

MARSEILLE—NEW CATHEDRAL AND CHURCH OF ST. VINCENT DE PAUL.

THE Cathedral of Notre Dame la Majeure, Marseille, is situate at the seaward extremity of the hillock upon which the older town stands, a site which was formerly a little promontory in the sea-worn coast line, but which now, changed by modern works of quays and docks, is an elevated "place," between them and the town. The new Church was commenced twenty-five years ago (1855), a part of the old structure being removed to make way for it. The excavations discovered unexpected remains of an early Christian Baptistery, of which no records exists, and one or two other fragments believed to be Grecian; for this spot of land has been from time immemorial the site of sacred edifices, appertaining to a city which claims to be one of the most ancient of Europe. These remains, with careful accounts of their positions, &c., are the subject of an archæological work now in preparation.

The new Cathedral, a great work, is nearly complete so far as actual construction is concerned, the work at present in hand being principally the carving of capitals, arches, &c, and the mosaics with which many portions are to be decorated. But money is now more scantily apportioned to such purposes in France, than was the case a few years ago; only some thirty workmen are engaged, and these entirely upon the nave, which it is intended to complete for public service during the ensuing year—at the present rate of progress fifteen years will be necessary to complete the whole.

The first architect (to whom of course is to be attributed the design) was M. Vandoyer, who died in 1872, and was succeeded by his pupil, M. Esperandieu. This architect, several other of whose works adorn Marseille, died three years later (1875), and since then M. Revoil, of Nimes, has fulfilled the duties. The cost, to the present time, has been about eleven millions of francs or £440,000, of which some 1,800,000 francs were expended in foundations alone, the soil being of unequal character, of rock and débris, undermined and weakened by the formerly encroaching sea. The style is Romano-Byzantine, and the Cathedral at Perigueux is the frequently evident prototype. The plan is the usual cruciform composition, with domes over crossing, choir and transepts, and over the small chapel of the Holy Virgin, which extends eastward beyond the choir, and two towers flank the west front. The external dimensions are, about—length 450ft. (over all buildings) width 80ft., or across transepts 140ft., and height (to top of the central cupola) 250ft.

From the south-east the aspect is superb. The great central dome over cross-ing, with its graceful cupola, the less lofty domes over choir and transepts, the circular-ended apse with a very effective arcade, rising above the stone roof of its aisle, and below this three octagonal chapels around on each side, and semicircular apses to choir aisles, with, more in the foreground, the eastern detached chapel, also crowned with a dome and angle cupolas—all these skilfully grouped features form a magnificent composition of well proportioned parts. The wall-surface is generally divided up with pilaster-like piers, and semicircular recessed arches, upon a large scale; and is everywhere faced with white and grey stone in alternate courses. Mosaics of coloured stones (after the manner of the Auvergnat churches) decorate the spandrels, friezes, &c., about apses. The domes are ribbed and covered with lead, except those to tower and eastern chapel, which are of stone worked in scales. The ring of flat gables over the arches of the upper drum of domes does not, however, even here, appear a beautiful line, although it is so frequent in the style.

From the west the view of the Cathedral is not nearly so good, and this is, unfortunately, by the usual approaches the most prominent. The long lofty aisles are monotonous, with their three flat gables and horizontal lines of two coloured stone courses. The side is relieved only by a small apse-like excrescence near the west end, and the towers do not group well with the dome behind them, although the west front is in itself very fine. It has a great arch from tower to tower, upon piers and shafts; and over it, an arcade containing statues in the arched niches. Below the arch the wall is recessed to the back line of towers, and is divided into three stories. A bold semicircular-headed doorway is in three orders, the first of red marble alternated with gray stone; the other two white, enriched with surface-carving, and enclosing a finely carved tympanum; the shafts are of red marble with delicately-carved capitals. The next story is an arcade of three windows with dark green marble shafts, and red and grey alternate voussoirs; and the third story, under the main arch and vault, has a circular window with eight cusps. All this recessed façade is richly carved and the spandrils of arches, the cylindrical vault between towers, &c., are decorated with Venetian glass mosaics of conventional design. The towers themselves are open below, with entrances to aisles; an arcade round them ranges with that across the gable, and above it each has one story square, breaking back to a low octagon crowned with a stone dome.

The interior is thus arranged.—The nave is in three bays, with domes resting directly upon round arches. The aisles are sub-divided into three bays and two stories, by a secondary arcade carrying three small domes; and the roof above the gallery thus formed is a plain, transverse cylindrical vault. The west gallery is similarly designed. There is a small semicircular-headed window to each bay of lower aisle, and a larger, in three lights, to the upper. The aisles terminate eastward in masses of masonry twenty feet square, pierced in each direction, in two stories; upon which rest the broad arches or vaults, carrying the domes of transepts and crossing (see Perigueux). This latter roof has its additional height in a drum resting upon the pendentives, and an arcade round, under the springing; while those to transepts and choir have the arcade only, directly upon the pendentives. The sides of transepts and choir are also sub-divided into three arches, and have round windows over. The choir consists of—first, the section with plain vault; then the domed square, with arcaded sides, then another section of plain vault, terminating in a semicircular-domed apse with arcade of eleven arches of marble, upon rich chocolate-coloured marble shafts, attached to piers, and having pedestals beneath. All this end seems very small, and the aisle and chapels behind are scarcely discernible through the little openings. The top of the arcade is only high one story of the two of the choir, and the half-dome over is stilted an equal height, to give a large surface for mosaic decoration; but it is doubtful whether the effect thus gained will compensate for the loss of the richness and variety which a more open arcade would have afforded, in combination with the now concealed background. The double stair down to the crypt is formed in the thickness of this innermost circular wall, each pier being pierced with an archway; an arrangement which is a little weak, both in appearance and in fact. The choir aisles (three bays of two stories) have interesting cylindrical vaults instead of domes, anticipating the necessity for that arrangement in the continuation round apse, where the bays become of course irregular in plan. These vaults are without ribs, however. The outer side of this narrow aisle has a good arcade, open to the transept chapel beyond, of which the vault is cylindrical, with massive ribs and piers, dividing it into four bays, with shafted window to each, high up, a design of much dignity, even for such a small interior. The small chapels around aisle of apse are about three quarters of a circle in plan internally; and are covered with ribbed domes.

The chapel of the Virgin is connected with this part by a short vaulted passage. It is square, with four arches upon piers in angles, which carry arched pendentives and an octagonal dome with ribs; and it has a half-domed apse. The crypt under this chapel has intersecting vault and arcaded apse.

The internal work is principally in coloured marbles, and a hard fine limestone, all of local production, as these are materials in which the district is very rich. The vaults and domes are constructed of thin bricks, or tiles; and are to be decorated with the Venetian mosaics already mentioned; as also are many portions of wall-surface, such as spandrels of arches, &c. The floor will be of marble mosaic paving.

This is an edifice which will improve by age; the contrasted courses of the exterior have yet a little crudeness, which time and weather will soften; and of course the interior, being in a style whose ornament is nearly all of applied, rather than constructional, character, is not fairly appreciated without it; but even now the bare walls have considerable grandeur and dignity, in their size and proportion; to which also the freedom from meaningless vagaries of detail, or misapplied features, which this simple style enjoys, contributes not a little.

At the head of the Allées de Mielhan is the site of the new Church of St. Vincent de Paul. It is a fine building, in the Geometrical Gothic style (XIIIth century) of which the choir, transepts, and one bay of nave are already in use for public service; and the remaining parts are in course of construction. The design shows scarcely any attempt at novelty, and very little at variety; but it is throughout well proportioned and pleasing, and has all the dignity of the ancient examples by which it is modelled. The nave transepts and choir are composed of almost similar parts; lofty stilted arches, upon clustered piers, continuous arcaded triforium of four pointed arches to each bay, and agreeable clerestory, with four-light window, having the tracery continued some distance below the springing line of arch. Vaulting shafts (three shafts clustered upon a small square) divide the bays, with moulded strings running round them, and carry quadripartite vaults of good proportions. The choir and its double aisles are of two bays, the former having the same design carried round the polygonal apse, but, this being without aisle, has small windows below the triforium. The ends of aisles are square.

The transepts have, upon the ends, arcades continuing the triforium, with small lancet windows; and over them great circular windows under pointed arches, the shafts in tracery radiating inwards. There are entrances beneath.

The aisle-walls are set back nearly to the outside of the buttresses, forming chapels between them, with quadripartite vaults and two-light windows. All the windows in the part completed are of stained glass, which, for quality of design and richness of tone, rivals that of ancient times, and greatly surpasses the usual modern achievements. Those to aisles and transepts are of small figure compositions in compartments; the clerestory has single figures, with canopies, pedestals, &c.

Externally there are streets upon three sides, but the apse is somewhat concealed by houses. This part seems to want the flying buttresses which are prominent to choir, but it is nevertheless good and effective. The transepts have massive buttresses rising at angles to gablets, with shafts and crockets, &c., and surmounted by pinnacles, also with shafts, upon angles. The roofs have pierced parapets of quatrefoils,

all along. The flying buttresses to choir are good; they have crockets, shafted pinnacles, and small columns bearing the arch against wall. Nearly all the carving and moulding remains unfinished. Coming to the present works, they show at the west front, three portals with lintels and tympanum, arch and gablet, to each, to be decorated with crockets, niches, and sculptured figures. Bold buttresses divide the front, denoting the nave and aisles, and an arcade corresponding with the triforium, crosses it; with, to the nave, a large rose-window over. The towers and spires are to rise to a height of 260ft. from ground.

The site falls rapidly to the westward, so that the crypt (which will be sub-divided with many pillars to carry vault) is half out of the ground here, and the west entrances will have a fine terrace and steps.

The total length of the church is about 220ft., and width about 70ft., or 86ft. over transepts.

The present works (to nave) have been six years in hand, and are now advanced to the commencement of the vaults. The architect is M. l'Abbé Pougnet, whose skill is devoted solely to religious architecture.

R. W. GIBSON.

DECORATION AS APPLIED TO ARCHITECTURE, FROM A PAINTER'S POINT OF VIEW.*

(*Concluded from page* 720.)

CONSTRUCTION.

ALL through the stanze one meets with a great deal of misplaced decoration. In the so-called "Disputa" the pilasters at the sides drawn in perspective are a great mistake, and I cannot see the occasion for them; the perspective of the pavement gives quite enough perspective to the picture. The ornament round the top of the picture is also in perspective. The whole would gain if this were more conventionally treated, and the painted moulding dividing the panels of the ceiling might perhaps be treated rather more flatly, as in many cases they have the appearance of real mouldings. This applies to a certain extent to the ceiling by Pinturicchio, in the choir of S. Maria del Popolo, where the painted mouldings are in some cases very deceptive. There are very strong cast shadows from the pilasters (painted) of the niches containing the figures of the four Fathers of the Church in the pendentives, which have a very unpleasant effect, as it strikes the observer that such niches could not possibly exist in such a position, and it makes them look as if they would fall forward at any minute. This realistic treatment is surely an error. Had the cast shadows not been insisted on there would have been no objection to the painted architecture, as it would then have become merely a symbol, and a means of dividing up the space. This ceiling has been very much restored not long since, and much of what we now see is due to other hands than those of Pinturicchio. This painted architecture is to be found in all the stanze and on the roof of the Sistine Chapel, and we have all heard much said against it in these days by architects; but surely there can be no reason against dividing a ceiling beautifully by means of an imaginary architectural construction and decorating the spaces so made, so long as (and this is the important point) the architecture is treated as painted architecture, and not carried so far that by means of strong cast shadows and very forced perspective it is made to look as if it formed part of the actual construction of the building decorated. There are few things more annoying than looking up at a ceiling and fancying that you see the groining of a roof, and discovering, on closer examination, that it is only painted. On the other hand, I fail to see why a ceiling should not be divided as if by groining correctly designed, supposing the construction to be actually vaulted. If it be treated quite flatly, and merely as a means of separating one portion of the vault from another, all these representations of architecture should be definite representations; there should not be for a moment a doubt in the mind of a spectator that what he sees is not a real moulding, but a painted one; and were these mouldings treated carefully they need deceive no one. In the case of Pinturicchio's work in S. Maria del Popolo, what we now see of strong cast shadows and other resources for realistic effect is due to other and later hands. Almost all his work in this church has been much injured by so-called restoration, and the great thing seems now to be to make a thing look like what it is not. Formerly in Italy, and doubtless elsewhere, a brick house was covered with stucco and marked so as to look like stone; now they cover it with stucco and then paint and mark it to make it look like brick again.

In the case of the Sistine Chapel the figures are so solid and so wonderfully real that Michael Angelo may have felt it was necessary to make much of his painted architecture in order to support his figures, and consequently has made it stronger in relief than would perhaps have been justifiable in the case of figures less wonderfully solid and in every sense large. Each niche in which a prophet is seated has its own vanishing point, so that there can be never any question as to the reality or non-reality of the representation. But, on the whole, it would be better not to represent, in a purely decorative way on a surface, things which might themselves in reality be there. False construction and bad taste are carried to an extreme excess in the Sala Constantino, which is later in date than the other rooms.

We find the huge picture of the battle of Constantine painted on the main wall, with edges painted so as to look as if the picture were painted on a curtain, with a fringe at the bottom, and the top edge shown as if suspended from rings, though the artist has not gone so far as to carry the folds which must necessarily ensue down into the picture, which, if consistent, he would have done. What is so objectionable in this last room, with regard to the painted architecture, is that what is painted in order to represent, say, a pillar or pilaster, either to divide a space or to emphasise construction, often forms part of the actual picture as well. So what he has really done is to jumble the whole thing up together; architecture painted so as to represent real architecture, architecture painted so as to form part of a picture, and architecture professing to serve both these ends forming part of a picture, and forming part also of the construction of the room; and each and all represented in an equally realistic manner. But this is a supremely bad example of the style, and it should be borne in mind that in this style of the Renaissance, both early, middle, and late, the architecture is often responsible in a measure for the decoration, and much that is admissible in Late Renaissance decoration would not be admissible in a purer style.

The indifference to construction seems to be almost a principle of a great deal of Renaissance architecture, and in direct contrast to the Gothic principle (which is more in favour now) of showing on the outside, as far as possible, the construction and arrangement that is within. No wonder, then, that the decoration assumed a similar license, and false construction became a canon of art decorative as well as architectural.

What is so beautiful in Renaissance decoration is the design of the detail and the execution and finish of the work, often wrongly distributed, often put high up in places where it cannot be seen, often divided up and injured by the excessive amount of it, but usually lovely in *motif*, and generally exquisite in execution.

RELIEF.

It is the fashion with some architects of the present, when they have figure decoration to design or superintend, to insist on having it in flat tints with dark outlines. In some cases, no doubt, it is want of funds which makes this a necessity if the decoration is to be of figures; but to assume it as a principle of good decoration is surely a mistake.

The early painters of the 12th and 13th centuries did not make all their figures flat because they thought it right, but because they were unable to make them round and solid; and it is easy to trace the effort to attain solidity and roundness through all the best art of Italy right up to the 16th century. The beauty of these early pictures consists in no way in their flatness, though I have often heard work of this kind praised by architects for its decorative fitness, because it was flat. The flat tint and dark outline is only a concession to want of funds, or inability to produce work demanding so much more time and skill. Of course, the amount of relief required depends on what the decoration is, what place in the whole scheme of decoration it occupies: if on a place of very evident constructive value it should not (as before mentioned) be in very strong relief; but in a case of this kind the sort of decoration employed would and should preclude this being possible.

The more important parts constructionally of a building (following the principle discussed when speaking of construction) certainly demand less relief than those spaces less necessary to the construction. For instance, a pilaster will bear less relief (not only relief represented by means of colours on the flat surface, but relief modelled as in stucco or marble) than will a spandrel. As rounded forms are shown off more in a side light than a front or a diffused light, the relief of the stucco must be treated accordingly. A very good effect seems to be obtained in many instances by incising a line, especially if it be upright in its general direction; this will always tell in a diffused light. The Elgin frieze is a very good example of a similar treatment. It was intended to be seen in a diffused light, and the whole treatment is very flat, the outline being every now and then insisted on. Of course, when much relief is used in a decorative treatment of stucco, it must be supported by much greater strength and width of mouldings.

MATERIAL.

A final word on the subject of the materials for decorative purposes. Of course, from my point of view, fresco is, *par excellence*, the material, and it is a great pity that it is not more used in England. I do not mean that it should be used only for the production of important pictures, which seems to be the only use to which it has yet been put in England, but for ceilings or walls decorated with arabesque or what not, and places where large pictures may not be required, it possesses to the full all the qualities most desirable for this as well as for large monumental works, and spirit fresco so called (the Gambier Parry process) comes very near it. For some reasons not hitherto satisfactorily explained, pure fresco does not seem to stand well in this country,—I fancy very often because we do not sufficiently know how to use it.

Most of the painting which we find combined with stucco relief is in distemper and most beautifully executed; indeed, the tradition of this work has been handed down even to the present day, and I believe Italian workmen are to be found now who are no longer artists in the right sense, but whose technical skill enables them to execute ornamental work in distemper in a way that very few Englishmen could. It is, to a great extent, the same in Italy with all the arts. The workers in marble and the wood-carvers are to this day almost unequalled for a certain technical skill and power over their material. But I think that even if the pictures are only to be small medallions surrounded by much ornament, as in the ceiling before mentioned, in the third chapel in S. Maria del Popolo, that fresco is a very good material, and one which might be used with better effect than any other. But, putting aside fresco, there are many other modes of painting walls.

Encaustic is a very fine medium, seldom or never used, I believe, in this country. We all know its wonderful powers of lasting and of withstanding damp. According to Müller, the wall paintings at Pompeii were not encaustic, but merely water-colours on smooth plaster—distemper in fact, though the effect of some of them is certainly much like encaustic. At Herculaneum, which I have not visited, Müller says the ground is generally fresco and the rest tempera. A great deal of the Egyptian painting was very like encaustic; if not so in the true sense, the colours were mixed, in a great measure, with wax, and laid on the dry plaster. True fresco does not seem to have been known to them, at any rate not used. Wax might be made much more use of; it renders colours safe from damp, and gives a good surface, besides being a very pleasant medium to work with.

* A paper by R. CORBETT, read before the Architectural Association on June 10, 1881.

SANITARY KNOWLEDGE FOR YOUNG ARCHITECTS.

LAST week, Mr. Henry Masters read a paper on "The importance of correct principles in sanitary knowledge by the young architect," before the Junior Archi-

tects' Society, at the Fine Arts Academy, Queen's-road, Bristol. Mr. Masters advised the young architect to take every opportunity of observing intelligent and slovenly workmen in their work, and to judge for himself as to the correct mode of executing works, and not to be satisfied by following strictly the text-books, but rather to think for himself, and he pointed out some of the errors in the published model specifications. A reference was made to the mode of drainage adopted by the designers of Mediæval buildings, and also to the advice given by Vitruvius in relation to drainage, and the selection of healthy sites for dwellings. Defects in drainage of the modern builders' houses were pointed out, and that costly elaborate systems were often introduced to the exclusion of more simple, inexpensive, and scientific modes, and examples of defective sanitation were shown by drawings and remedies suggested. The nature and quality of sewer-gas were described, the principle of the "trap" fully explained, and its insecurity as a keeper out of sewer-gas pointed out, and the importance of having properly ventilated traps to meet the difficulty, as the passage of sewer-air through water traps was a well ascertained fact, and that a water trap could not be relied upon. Siphonic action was next described, and the power a column of water exerted in passing down soil, bath, or lavatory-pipe, which often cleared out the water-traps, and left the pipe open to the public sewers, so that sewer-air passed freely into the house by such pipe. Drain-pipes were described, and the right and wrong way to lay them pointed out, and examples of subsidence and settlement quoted; in one case of a drain passing under a lawn that had been excavated for a quarry, and afterwards filled in with rubble, it assumed the form of a curved line downward, and soon became stopped, and the evidence of stoppage was discovered by the presence of sewage through the floor-boards of the servants' hall. The importance was urged not only of having all drains set perfectly true and with sufficient inclination, but that a proper foundation be secured. Apparatus—good, bad, and indifferent—were described, and he demonstrated that the most costly and elaborate was not always the best, but often the worst. The kitchen grease and rat difficulty were pointed out, and grease traps described, and the importance of one to every house urged. The domestic supply of water was elaborated, and the danger of underground tanks and tanks in improper positions pointed out, and the liability of store-water being contaminated by sewage or sewer-gas. Mr. Masters then urged the importance of house drain-ventilation, and the evils of the close house-drain, and described the action of air, the diffusion of gases, and the persistency by which bad air passes into dwellings, and the evils of inhaling such bad air, and the liability of disease by fever and other evils being conveyed by drain-air. The various systems of Norman Shaw, Hellier, Buchan, Potts, and others, were described and commented upon, and a plan for draining a house described. Attention was drawn to the multiplicity of small so-called ventilating pipes which may be seen upon a large number of houses of Bristol, Clifton, and elsewhere, and Mr. Masters said they would find upon investigation that such contrivances in a large number of instances are ineffectual, in consequence of being put up by those who were ignorant of the simplest principles that govern the motion of air, and that such contrivances erected in ignorance gave a sense of security, and were, after all, a delusion and a snare. The paper was accompanied with a number of explanatory drawings and some experiments.

Memorial-stones were laid on Saturday of a new Primitive Methodist chapel at Greetland Wall Nook, near Halifax. The chapel is 49ft. by 33ft., and is built of local stone, with rostrum, choir seats, pews, and all woodwork of pitch-pine. In the basement are schools, including assembly-room, 30ft. by 25ft., and three class-rooms, each 16ft. by 8½ft. Mr. W. H. D. Horsfall, of Halifax, is the architect, and the contract for masons' work has been taken by Mr. Thos. Noble, of Greetland. The cost will be £700.

Mr. Arthur Finlay, of Sunderland, was, last week, elected sanitary inspector for Scarborough, at a salary of £110 per annum.

Building Intelligence.

Croston, near Preston. — The foundation-stones of a Wesleyan chapel, in connection with the Ormskirk Circuit, were laid on Monday last. The new chapel will be built on the easterly side of Westhead-road, on a freehold site given by Mr. W. Woods, of Croston. The style of architecture will be Gothic. The buildings comprise a chapel 55ft. by 35ft., with vestibule in centre of front, 14ft. by 5ft. The height of the chapel inside will be 17ft. to the square, and 24ft. to the ceiling in centre. At the rear of the chapel will be a ministers' vestry, 15ft. by 14ft., 11ft. high, and a heating apparatus and tea-boiler room, 14ft. by 7ft. Suitable and separate offices will be provided in the yards at the rear of the site. The premises will be heated with hot water with a low-pressure boiler. The ventilation has been carefully considered, inlet and outlet flues being provided. The building is designed so that, at some future time, a gallery can be placed at the front end, opposite the rostrum. The chapel will be fitted up with comfortable pews and forms to seat 300 adults. The plans have been prepared by Mr. S. Hurst, of the firm of Messrs. Maxwell, Tuke, and Hurst, architects, Southport, and the works will be carried out under the architects' personal superintendence. Mr. Wm. Vaughan, joiner and builder, Southport, is the sole contractor. The cost, when completed, will be about £1,200.

Eastbourne.—The foundation-stone of a new church of All Souls' was laid on Tuesday week. The internal dimensions are: nave, 86ft. 6in. long and 49ft. to apex of open-timber roof; north and south aisles, each 86ft. 6in. by 13ft., and 18ft. high to plate; chancel, 40ft. long, with north aisle, and vestry and organ-chamber on south side. The church will be seated for 880 persons. The facing materials are red bricks from Keymer, and buff Tamworth bricks, with red and buff terra-cotta dressings. Internally, Burnham bricks and white and blue Corsham Down stone will be used. The tower will be 16ft. square and 83ft. high. Mr. J. Peerless, of Eastbourne, is the general contractor.

Manchester Cathedral.—Under the directions of Mr. J. S. Crowther, architect, workmen are engaged in removing the thick coatings of Roman cement from one of the pillars at the west end of the middle aisle of the nave of the Cathedral. The work is being carried on to ascertain the present state of the stone-work of the pillars in the nave. Some faint idea may now be formed of the original design of the pillars. Until the churchwardens' act of barbarism in 1815-19, the west end of the middle aisle of the nave (according to Mr. Palmer's account in Dr. Hibbert-Ward's "Foundations") presented a plain surface of masonry. Previous to that period the pillars, arches, and mouldings, along each side of the nave, and the side aisles, were, according to the same authority, coated with Roman cement. "But the addition," Mr. Palmer adds, "of more than an inch of cement in thickness upon the surface of the mouldings, on the pillars and arches, has so swelled the toruses and reduced the hollow mouldings to such an extent, that they no longer present the fine proportion they once possessed; nor can they now be compared with those which remain unencumbered with that material in the choir."

Northwich.—A new Wesleyan chapel at Northwich was opened on Wednesday week. The edifice is from the designs of Mr. C. O. Ellison, architect, Dale-street, Liverpool, the style being Gothic of simple type. The structure is composed mainly of bricks, and terra-cotta is largely introduced, the moulded dressings being made of that material. Accommodation is provided for about 353 persons on the ground-floor, in pitch-pine seats of the most modern kind, and at the end gallery there is room for over 100 persons. The cost is about £3,000. The contract was intrusted to Mr. Bostock, of Leftwich, and the brickwork was sub-let to Mr. Henry Shaw, Castle Northwich. The whole of the terra-cotta work was supplied from the works of Mr. Jabez Thompson, Manchester-road, Witton.

Southport. — The foundation-stone of a Wesleyan school-chapel was laid on the 9th inst. The style will be Gothic. The walls will all be of brick, and all outside walls will have a 3in. cavity. The front will be faced with the best Burnley Stock bricks, with buff terra-cotta ornamental panels under the windows, and will have stone base course, sills, and strings, and stone weatherings to buttresses, and moulded stone labels round window and door-arches with carved-stone bosses. All the dressings will be of the best Longridge stone, and the steps, thresholds, &c., of Rossendale flag-rock. The whole of the internal woodwork will be of the best pitch-pine, twice varnished. The buildings comprise a large room, 50ft. by 30ft., 14ft. high at the sides and 24ft. high in the centre, with an entrance-porch and vestibule, 9ft. by 8ft. in centre of front. There will be four class-rooms, each 14ft. by 13ft., and an infants' school-room, 19ft. by 11ft. All these rooms will be 13ft. high. There will also be a library, 6ft. by 6ft., a tea-room and lavatories, 14ft. by 8ft., and outside porches at back for exit into boys' and girls' yards respectively. Suitable and separate offices will be provided at the rear of the site. The buildings have been designed by Mr. S. Hurst, of the firm of Messrs. Maxwell, Tuke, and Hurst, architects, Southport, and will be erected under the architects' personal superintendence. The whole contract is let to Mr. Wm. Wilkinson, joiner and builder, Southport.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Yorkshire Architectural Society. — On Tuesday week the members of this Society had their summer excursion, the district selected being Pickering and the neighbourhood. The excursionists reached the town about a quarter past eleven o'clock. They at once proceeded to the residence of Mr. Kendall, Low Hall, and there inspected his collection of Ancient British urns, flints, arrow-heads, and other antiquarian relics. Pickering church was next visited by the party. There are traces of remains of Norman architecture, but, as a whole the fabric is of the style of the 14th century, when the Early English passed into the Decorated period. There are several fine monuments in the church. The Rev. George Rowe, York, read a paper respecting the fabric, which he stated was dedicated to St. Peter. It stands on the side of an eminence which rises to the castle some little distance to the north. It is composed of chancel, transepts, nave, north and south aisles, tower and spire, south porch, and a chapel on south side of the chancel. There is also an organ-chamber on the north side. The church, having previously had sundry repairs, underwent a thorough restoration in 1877, when the whole, westward to the crux, was rebuilt, as far as possible with scrupulous regard to following the old building. The nave piers received new bases, the aisle windows were renewed internally; the tower, which was in a great state of dilapidation, was happily decided to be kept, and strengthened by powerful buttresses embracing the angles. The next place visited was the old castle of Pickering, which is situated on an eminence on the northern extremity of the town, near the railway station. The date of the erection of the castle is unknown, but there is no doubt that a similar structure existed here from a very early period. The first mention of it in authentic records is in documents of the reign of Henry III. In 1399 the unfortunate Richard II. was confined in Pickering Castle for a short time previous to his removal to Pontefract Castle, where he was murdered. In the reign of Charles I. the castle was besieged and taken by the Parliamentarians, who dismantled it. The Rev G. Rowe read a paper relative to the castle, stating that the outer western wall runs along the edge of the escarpment, and returns along the eastern side in an irregular line. The entrance is from the south. The gate-house is nearly demolished, but the remains of the barbican exist. The tower at the south-west corner was called the Mill Tower. It is in fair preservation as to its outer walls, and has a small turret on the top of it as a look-out station, and from which a distant view is to be obtained. The wide interior is divided into three courts by two very thick walls, running west and north from the keep in the centre. This, with the walls, is surrounded with a deep moat, now filled with trees. A moat also

ran externally all round the eastern circuit of the castle. On entering, the visitor crosses the inner ditch, and into a very strong tower on the wall in front of him, through which, apparently, led the way into the keep. This building is entirely in ruins, but enough remains to show its importance. In the inner court was a small Early English chapel, long since desecrated, and now used as a Court-house. It contains nothing of any interest, even its windows having been replaced by plain, square casements. Beyond this, in the outer wall, is a late Norman portal, now built up. The north part of the castle inclosure is formed into a garden, and at the extreme end of it are heaps of ruins, which indicate buildings or their foundations under the ground. A third wall commences from the north wall before mentioned, but is completely ruined. At the end of the north wall was the Devil's Tower, a great part of which still remains, and comprises a dungeon below. This tower has slits for archery towards the keep for defence, in case the courts were occupied by the enemy. It was accessible from the keep by the wall. The last tower we have to mention is on the east side, called Rosamond's Tower, the walls of which, nearly perfect, are three stories high. Leland says that there were, in all, eight towers, including the keep. Several of these may have been on the west wall, which has suffered most severely. Underneath the Devil's Tower is a sally-port opening on the moat The castle was rebuilt in 1247, but it had been a place of great strength before Henry III. made Lord Dacre the governor, and afterwards gave Pickering and its castle to his son Edmund. The excurtionists then proceeded in vehicles to the village of Newton. At three o'clock Cawthorne, four miles from Pickering, was reached—a place of interest on account of its extensive Roman fortifications. One of the four camps which exist here has evidently been a permanent military station, with the Roman road from Malton to Dunsley passing through it. Cropton, half a mile distant from Cawthorne, was the next place reached. Here is the site of some early British work. The chief of these is a lofty mound about 220 yards west from the church. It is about 30ft. in height, and 150ft. when measured from the bottom of the trench, by which it is defended, over the top, and to the bottom on the other side. The summit of this mound commands a beautiful and extensive prospect. At Cropton is a neat church having no peculiar features about it, and the famous Hall Garth Hill at a short distance from it. The afternoon was too far spent to allow the party to make anything more than a cursory examination of these interesting places, and although the excurtionists had intended to visit Sinnington Church, and the ruins of the desecrated chapel of the Nunnery, it was impossible for want of time to carry out this arrangement. The party therefore went forward to Middleton Church. The Rev. G. Rowe read a paper on the structure, stating that it was remarkable for having had additions made to it in all styles but the latest. The lowermost stage is Saxon, as witnessed by the long-and-short work at the corners, and by the Saxon door at the west end. There is also part of a Saxon cross—probably the churchyard cross—built into the wall above the door. This was scarcely later than 900, perhaps earlier. In the Norman era, late in the style—*i.e.*, about A.D. 1200, the nave was built, the piers of the arcade having good Norman caps coupled with circular arches. There was probably more of the church erected at this time, but it cannot be now ascertained how much. Within forty years from the last date the Early English windows of the aisles were added, and perhaps the walls themselves. In the 14th century, the Decorated tower-arch was built anew, and the Decorated window in the tower, when the battlemented parapet was added. Since then, nothing has been done to the church except just so much repair as to keep it from utter ruin. It is a church of great promise to the judicious restorer, and might be made a really handsome fabric, which would last many times longer and be many times better than a new church.

SOCIETY OF ANTIQUARIES OF SCOTLAND.—At the last monthly meeting of this society, Dr. Maclauchlan read the second paper, which was a notice by Mr. J. Romilly Allen, C.E., F.S.A. Scot., of sculptured stones at Kilbride, Kilmartin, and Dunblane. The old burying-ground at Kilbride lies three miles south of Oban. Close to the south wall of the present church, which is not older than 1740, lie the fragments of a very beautiful specimen of a West Highland Cross, from which the rubbings exhibited were taken. The shaft is broken in two places, but none of it is wanting. Its total height is 11ft. 6in. and it is elaborately carved on both sides. One side presents the Crucifixion, with the monogram I.H.S. The shaft is filled with the usual foliageous scrolls, and lower down is the inscription which shows that it was erected by Archibald Campbell, of Laerraig, in 1516. On the other side is a shield of arms, displaying two galleys and two boars' heads quarterly. No other Highland cross bears a shield of arms. Mr. Allen noticed two cup-marked stones in the neighbourhood of the church, and one in the island of Kerrera. The cross at Kilmartin stands in the churchyard, and is 5ft. 6in. high. Its form and ornamentation are purely Celtic, thus differing from the ordinary West Highland crosses and slabs, which are covered with foliageous scrolls. Its ornamentation consists of interlaced work, divergent spirals, and key patterns or fretwork. Drawings of the cross to scale reduced from rubbings by Mr. Allen were exhibited, and also photographs by Rev. J. B. Mackenzie, of Kenmore, F.S.A., Scot. The sculptured slab at Dunblane has been known for some years, but never described or illustrated. It bears a cross of the Celtic form; the heading, which forms the outlines of the cross, terminates in spirals at the top, and serpents' heads at the bottom. The reverse of the slab is covered with figures of animals, human figures, and symbols. Drawings of both sides of the slab were exhibited by Mr. Allen.

COMPETITIONS.

EDINBURGH.—The Free Presbytery of Edinburgh on Thursday week approved of plans for the erection of a new church in Easter-road, to be named after the late Dr. Guthrie. The committee invited plans from four architects by private competition, with the result that they selected those of Mr. Charles S. S. Johnston, Pitt-street, Edinburgh. The church measures 73ft. by 47ft. internally, and is seated for 562 persons, with an end gallery stretching across the western portion of the nave and ailes, seated for 190 persons, giving a total of 752 sittings. A hall, 36ft. by 24ft.; session house, 19ft. by 15ft.; vestry, 12ft. by 10ft.; and lavatory are situated in rear of the church, while the heating chamber is placed underneath the pulpit, and is to be vaulted with brick. The style adopted throughout is Early English Gothic of a very plain type, and the estimated cost of the church is £3,500.

KENDAL MARKET.—A premium of £15 having been offered for the best plan for erecting a market-house adjacent to the present market-place, plans have been sent in by Mr. Cox and Mr. Brade, and are now on view in Kendal Town Hall. The former architect's design shows 20 shops and the latter's 27.

CHIPS.

The completion of the original scheme of the Yarmouth and North Norfolk Railway, by the opening of the section from Stalham to North Walsham, was celebrated, on Wednesday week, by a dinner in the latter town. The contract for the construction of the railway has been carried out by Messrs. Wilkinson and Jarvis.

The foundation-stone of a chancel now being rebuilt at Christ Church, Luton, was laid on the 9th inst. The new work comprises chancel, 34ft. 6in. by 24ft. 2in.; south chancel aisle, 20ft. by 14ft.; north chancel aisle, 6ft. by 15ft.; organ-chamber, 12ft. 3in. by 8ft.; choir vestry, 12ft. by 14ft., and clergy-vestry, 10ft. square. The cost will be about £2,000. Mr. George Vyles, of London, is the architect; Mr. D. Dunham, of Luton and Toddington, has taken the general contract, and Mr. T. Marshall, of Dunstable, that for masonry.

The Ilkestone local board decided, last week, to reduce the salary of their surveyor, Mr. Haslam, to £120 a year, on the ground that the town could not afford to pay a larger salary at present.

The Horns club and institute, Bermondsey, was reopened, on Tuesday week, by Lord Folkestone, M.P., after the completion of structural alterations, renovation, and decoration, carried out by Mr. Wells, builder.

"To a practical man with a taste for mechanics, and the bumps of constructiveness fairly well developed, we can give no higher mental treat than a couple of hours spent over the June numbers of that truly marvellous publication the *English Mechanic*. In a hundred and fifty odd pages that make up the bulky mass of letter-press, there is recondite information on almost every conceivable subject, ranging from how to construct a mouse-trap, to the latest method of calculating the phases of Orion."—*The Brightonian*. Price Twopence of all newsmen, or post free 2½d.—3., Tavistock-street, Covent garden, W.C.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. PASSMORE EDWARDS.

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H. F. (Write Lockwood and Co., 7, Stationers' Hall-court, or see their advertisement in this number.)—GEO. BALL. (The same publishers sell Buchan's book.)

NOTICE.

THIS is the last number of Vol. XL. Vol. XLI. commences with the next number, ready July 1. The title and index to Vol. XL. will be published in the number for July 8, and bound volumes and cases will be ready shortly after.

N.B.—Bound volumes of Vol. XL. should be ordered at once (price Twelve Shillings), as only a limited number are done up. A few bound volumes of Vol. XXXIX. may still be had, price Twelve Shillings; all the other volumes are out of print. Most of the back numbers of former volumes are, however, to be had. Subscribers requiring any back numbers to complete vol. just ended should order at once, as many of them soon run out of print.

Correspondence.

SANITARY PLUMBING AND PLUMBERS' WORK.

To the Editor of the BUILDING NEWS.

SIR,—Referring to Mr. Hellyer's lectures once more, I must first call attention to the portion wherein he advocates the use of a 3in. soil-pipe.

Some years ago, when I was working as foreman for the late Mr. John Jay, and the 3in. soil-pipe was adopted in some new buildings in the neighbourhood of Hornsey and King's-cross, so badly did they act on account of stoppages (although valve-closets were used), that I was compelled to remove them and fix 4½in. in their places. This is no exceptional case, as many plumbers know to their sorrow. One of the most astounding remarks Mr. Hellyer made was that, were he going to build a house for himself, he would have 2½in. traps for the closets. Upon my word, I cannot help thinking that this assertion was intended for a joke, and evidently many others thought so likewise, *i.e.*, judging from the smiling faces and nudgings of elbows to be seen all over the place. The joke, however, was confirmed when he told us that "When fouled, no amount of water sent through a trap would cleanse it," which was quite endorsed by one plumber present, who testified

to having taken out one of Beard and Dent's 4in. S-traps, with only a 1in. water-way through it. I have also an S-trap of the same size, taken out of a closet in Thurlow-square (and which I intend to send to the Patent Office Museum, South Kensington) that has a solid deposit on the sides of "1¼in. in thickness."

Mr. Hellyer seems to lose sight of the fact that it is not the soil that clogs the trap and soil-pipe, but the urine that nearly always accompanies it.

This point is more than proved by the trouble we have in cleansing and unstopping urinals.

In his lecture he simply ventilates a theory over a hundred years old, when he says that, "No sanitary fitting or pipe should be trapped in such a way as not to admit of the whole of the water being entirely changed every time it is flushed." Some of our forefathers were quite aware of this, and made quite as much to-do about it as Mr. H. himself. But in what did it all end? Simply this—a short run on the S-trap, which, fortunately, was again knocked on the head by "Bramah." Really, Mr. H. is only doing what Mr. Cumming did now one hundred and six years ago, although he does not appear to be aware that Mr. Cumming was well-conversant with the method of ventilating S-traps, of which many proofs are now existing.

Now, touching the D-trap. Why has the S-trap had another run? Because it is cheap, and its fault is not known by those who are crying down the D-trap.

Mr. Hellyer is mistaken in believing that the earliest trap used was the S-siphon or round-pipe trap, that he had seen marked in a drawing dated 1775.

I presume, by his remarks, that he had seen the specification of Cumming's patent, No. 1105, which bears date 1775; if so, it would have been much better if he had given these words which I quote from the specification: "The stink-trap hitherto used for water-closets is too well-known to require a description here, and although it may serve to cut off all communication of smell from the drains, pipe, and cesspool, it becomes in itself a 'magazine' of fœtid matter, which emits an offensive smell every time that it is disturbed by using the water-closet. In this water-closet, the pipe which carries off the soil and water is recurved about 12in. or 18in. below the pan or basin, so as constantly to retain a quantity of water, sufficient to cut off all communication of smell from below, and this stagnated water in the recurved part of the pipe is totally emptied and succeeded by fresh every time the basin is emptied." Now Sir, by the date of Mr. Cumming's specification, it is clearly shown that he was considerably more than one hundred years anterior to Mr. Hellyer, and he says that the "stink-trap hitherto used for water-closets is too well known to need a description here." How deficient then must be Mr. H.'s information as to the date of origin of these articles? I, however, am aware by some further facts, that the trap referred to by Cumming was the P and D-trap—I do not by P mean the half S-trap so commonly miscalled a P-trap—which I can indisputably trace back to at least 1687, as I have one in my possession bearing that date. So much for the D-trap coming into use in the year 1790. In fact, if it were worth while, I could trace back stink-traps at least another thousand years; so, indeed, could anyone else, especially after studying such works as that on "Pneumatics," by Hero of Alexandria, the great Greek authority on these matters.

If the S-trap was so good, why was it discarded so many years ago? I take it that it has only been revived as a matter of trade interest and nothing else. I know one plumber, in a very large way of business, and who turns out some of the very best work in London, who quaintly says that the S-traps are very useful when melted down and recast in moulds of another shape, that will not allow the water to ebb out as the S-trap does.

In stating figures, Mr. Hellyer should endeavour to be somewhat more accurate. He estimated the yearly consumption of D-traps at about four or five thousand; whereas one firm alone supply nearly twice that number.

In reply to an application for permission to discuss a point in the lecture, the chairman said that the lectures would appear in the professional journals, to which any person could write letters in reply. This is all very well; but if everybody who wished to express an opinion were to write to the trade papers, there would be no room for any other matter, so numerous are Mr. Hellyer's dissentients.—I am, &c.,

P. J. DAVIES, H.M.A.S.P.

BUILDING-STONES.

SIR,—May I offer a contribution to the stock of information being elicited by the Truro Cathedral Controversy? "Durability," last week, wonders that Caen stone has not been thought of. The old stone used in the 13th century work in Christ's Church Cathedral, Dublin, is in remarkably sound condition on the whole. Mr. Street has pronounced it confidently to be Caen stone, and accordingly Caen stone has been used again in the late restoration. The old stone, on comparison, appears to be a coarser and grittier stone than the new. Whatever it may have been, it is unfortunately too evident that the new Caen stone is rapidly and extensively decaying. On the north side especially, the progress of dilapidation in less than seven years is a warning for Truro church-builders to take note of, if entertaining the question of Caen stone. This, of course, is a humid country, and trying to all building stones; but, so far as my limited observation has gone, the Cornish climate and country have reminded me more of Ireland than those of any other part of England I have ever been in.

There is, *per contra*, under my immediate observation a church built more than 20 years ago in Dublin, where Bath stone is standing very well.

The question of the origin of the ancient and, no doubt, sea-borne stone used along our Eastern coast, and, if I mistake not, in Western Wales, is of considerable interest. Mr. Street says Caen, but, beyond all manner of doubt, not from the quarries of Caen the modern stone came from. I should be happy, if anyone is interested in the investigation, to send him a sample of the ancient stone which has borne the test of six hundred years better than the modern Caen has that of six, with a view of identification.—I am, &c.,

THOMAS DREW, R.H.A.,
Cathedral Surveyor, Christ's Church.
6, St. Stephen's-green, Dublin.

Sir,—I cannot allow Mr. Masey's last letter to pass without a reply. He certainly writes as though he was personally interested in the Beer quarries, and the fact that he accepted Mr. Kirkaldy's figures in the case of Beer stone and ignored them in the case of Bath, implies that something more than an architect's interest has prompted him in his article and replies to those who could not agree with his theory. He asserts that Beer stone stands next to Portland in point of merit, "as the strength of the stone is beyond question"; but when defeated on that point by Mr. Kirkaldy's report of experiments on Bath stone from my "Monk's Park quarry," he at once shifts his ground and speaks of the foolishness of such experiments, and that "he could expect no faith in such." Now, if he attaches any belief to the experiments on Beer stone, why should he doubt the correctness of the report on Bath when both emanated from the same authority? I made no endeavour to to cast any imputation whatever on Beer stone, as I should consider I had a lame case if the only means I had of proving the superiority of one was by asserting the inferiority of the other. I merely wished to correct a mis-statement.

He then attacks Bath stone generally as not being a weather stone, and states "that with the exception of the Bath Abbey, no buildings of an ancient character are to be found above ground; but perhaps after perusing the following list of buildings he may alter his opinion somewhat, as I consider they should convince any disinterested person. I, therefore, append the following:—Farleigh Hungerford Church, consecrated Nov. 6th, 1443; Farleigh Castle and Chapel, early part of 14th century; Box Church, early in the 13th century; Charlcombe Church, supposed to have been erected early in the 12th century. The original east window may now be seen, the stone of which is in a thorough state of preservation, not the least sign of decay, the arris of the Gothic tracery being nearly as sharp and well defined as when placed in position. Widcombe Old Church, built 1499; portion of Hinton Abbey near Bath, date 1272; Manor House ditto, 21st year of Elizabeth. George Iron Norton, St. Phillip's, 15th century; Ditteridge Church, Box, 13th century; Batheaston Church, 1260; Magdalen Chapel, Holloway, Bath, 1495; Chaldfield Manor, about 1400; Englishcombe Church, latter part of 12th century; Lacock Abbey, 12th century; Bradford Church, 1156; whilst amongst the more modern, the portico of the Pavilion at Brighton, erected some 100 years ago, is now as good as new, and Prior Park, at the present time a Roman Catholic College. An extract relating to the last-named place from a book, entitled "Rambles about Bath," reprinted by R. E. Peach, 1876, is as follows:—"The Mansion with which Prior Park is crowned was designed and erected as a standing protest against the reflections cast by London architects upon the Bath Oolite or Freestone. With this view a commission was given by Ralph Allen, in 1738, to Wood the architect to erect an edifice sufficiently important in itself to command attention, and in its construction to spare no expense as a means of showing to the world what could be done with such valuable building material as that at his command." This building is without the least sign of decay, and the stone in the other buildings is in an excellent state of preservation.

The failures of Bath stone spoken of in London are isolated instances, the cause of one being the selection of a stone unsuitable for the purpose. I speak of Henry VII.'s Chapel. Had Box Ground or Combe Down stone been used for projections, and the same or thoroughly seasoned Corsham for the other parts, and all placed in its proper bed, Mr. Masey would not have been able to take that as an illustration: of the others named I know nothing. Mr. Masey gives no information as to the stability of Beer stone in the Metropolis.—Yours truly,

ISAAC SUMSION.

Newark-street, Bath, 21st June.

SIR,—"Durability" brings under notice, on p. 721, the respective prices of Bath and Caen stone for the Truro Cathedral. I beg to inform "Durability" that Caen stone is far cheaper than Bath, being 9d. per foot cube F.O.B. at the quarries, and could be delivered to any part in the Channel for about 1s. 1d. per foot cube, and might be even cheaper for a large quantity such as would be required for the interior of such as the Truro Cathedral. There is no disputing the fact that for interior church-work no stone is so suitable on account of its *finesse de grin* and colour. If "Durability" likes to write to me, I will give him some additional facts and figures.—I am, &c.,

E. FOUCARD.

16, Stoney-street, Borough, S.E., June 21.

COMPETITIONS—A GOOD LOOK-OUT FOR ARCHITECTS.

SIR,—The School Board of Winchcomb (Gloucestershire), wishing to have some school-buildings for 170 boys, advertised for designs, there not being any local architects in the town or neighbourhood to whom they could intrust the designing of so important an undertaking.

In reply to the advertisement, 18 competitors entered into the contest, nine of whom the local papers say are Londoners. One, if not more, of the competitors sent in two designs.

The *estimated* cost of the building, as stated by the designers, varied from £660 to £1,700—that is, from £4 to £10 per head.

The committee selected seven (out of the 18) for further consideration, the estimated cost of the seven being from £860 to £1,070. Ultimately they decided on one to cost £1,000.

It will be rather instructive to consider how far competitions like this benefit the profession in a monetary point of view.

To make any kind of dependable estimate, a journey to the town should be made for the purpose of examining the site, ascertaining the inclination of the ground, the nature of the substrata, the water supply, method of drainage, and cost of materials.

After that comes the preparation of the drawings, specification, and estimate of the works.

The whole of these items cannot be set down at a less cost to each competitor, on the average, than from £6 to £10; but say £6. That mul-

tiplied by 18, the number of the competitors, will be £108 as the total cost.

The average of the estimates is about £900, or, say, £1,000. Five per cent. on that sum is £50, showing a total loss of £58 to the competitors.

To put it in another way: Suppose there are 18 buildings of the amount of £1,000 each to be erected in various places, and the said 18 competitors compete for the said 18 buildings. The gross cost of the competitions will be 6 × 18 × 18 = £1,944; the gross receipts, 50 × 18 = £900; showing a total loss of £1,044, or an individual loss of £58.

A magnificent result, truly! But there probably may be some personal gratification in being allowed to enter the lists for so stupendous an undertaking, for, it will be seen, a county-surveyor's name figures amongst the number of the Winchcomb School competitors—indeed, he appears to be *the successful competitor*.

June 18. ONE UNCONCERNED.

VALUATION FEES IN BELFAST.

SIR,—As the subject of valuations is often before your readers, perhaps this case might be of some interest; the account is inclosed, also the Recorder's ruling.

By way of explanation, I may state that the Town Council of this town has some extensive improvements in hand which have afforded my professional brethren some employment. The case was tried yesterday before the Recorder, the jurisdiction of whose court is to extent of £50.

The amount of the valuation, £36 14s., was made up by ½ per cent. on the first £1,000, ¼ per cent. on the next £4,000, and ⅛ per cent. on the remainder, with an item for alternative valuation.

The amount of valuation was £19,523.—I am, &c.,

J. B.

9, Donegall-square, West Belfast,
June 17th, 1881.

BLACKSTAFF IMPROVEMENT.

Mr. Daniel M'Kinney.

To John Boyd, C.E. Architect, &c.

		£	s.	d.
1879. Oct. 28, 30, and 31.	To measuring ground proposed to be taken by Town Council for Blackstaff Improvement, making map of same and two tracings. To measuring warehouse, sawmill, and other buildings, &c., on the ground, calculating, &c.	5	5	0
Nov. 5.	To making valuation of ground and buildings, also alternative valuation	36	14	0
Dec. 1.	To consultation with Mr. Cramsies, Mr. M'Kinney, and others in Mr. Cramsies' office	2	2	0
" 4.	To making tracing of map for Mr. MacKinnon, E.E.	1	1	0
" 20.	To attendance in Arbitration Court	3	3	0
" 21.	To attendance in Arbitration Court and giving evidence	3	3	0
		£51	8	0

RECORDER'S RULING.

	£	s.	d.
To measuring, &c.	5	5	0
To valuation, &c.	31	10	0
To consultation, &c.	2	2	0
To tracing	1	1	0
To attendance in Court	4	4	0
	£44	2	0

THE ARCHITECTURAL MEMBERS OF THE ROYAL ACADEMY.

SIR,—Your correspondent, who signs himself "One Who was Not Surprised," does not appear to understand the point of my letter of June 10th. I will not dispute with him whether the present list of architectural Academicians and Associates does or does not contain the names of, what he calls, "second-rate men." What I complain of is, that although good men may from time to time be selected, the best are nearly always passed over; and not seldom men are elected whose merits are of a sort which should altogether exclude them They are not so much leading artists as men in a large way of business.

I fail to see the point of the remark about Classic work being badly represented. The question is one of artistic ability, not one of style.—I am, &c.,

A. B.

BUILDER AND ARCHITECT.

SIR,—I have been interested in reading the correspondence respecting the above. All the writers seem to have omitted to define what constitutes, in the present day, an architect, an architect-builder, and a builder-architect. Will someone kindly undertake the task? I presume that the well-known architect who, with an efficient clerk of works, has built a science college in the Midlands, the cost of which has run into the tens of thousands, strictly would be called an "architect-builder."

I am told that some talent and a good deal of study make a good designer, therefore, may I ask "M." why "a good architectural assistant" may not design as well as a "thorough architect"? Has not the one as good a chance as the other? Or is there the same difference between them as there is between a worker bee and a queen bee? May this assistant ever hope to become a thorough architect?

I am doubtful as to whether or not I may aspire to dub myself "architect." I have never worked for an hour in the office of a professed architect: but I have studied art and construction for some years under the best men in Warwickshire, and have passed Government examinations. I am young, but have tried my strength at designing small works, which have since been carried out: I have studied some engineering and a little surveying. Not having been "articled" to an architect, am I without the pale?—I am, &c.,

BEAR'S HEART.

CHIPS.

In Messrs. Lockwood and Co.'s advertisement in the BUILDING NEWS of June 10, the price of Sir Edmund Beckett's Book on Building was wrongly printed 2s. 6d. The price of the book is 4s. 6d.

Plans for new schools, by Messrs. Leeming and Leeming, of Halifax, were adopted by the Stainland School Board last week. The school is to seat 212 children, and is estimated to cost under £10 per head, exclusive of site.

All Saints' Church, Wolverhampton, is about to be completed by the erection of the chancel. Mr. T. Tayler Smith, of Finsbury-circus, E.C., is the architect.

At a meeting held at Bridgend town hall, on Monday, it was resolved to replace the present church at Nolton, Lower Coity, by a larger one, to seat 630 persons, and to be erected on a site to the west of the present modern Gothic building; the estimated cost is £5,000, of which £1,170 was subscribed at the meeting.

New schools, to be known as the Brecknock Schools, were opened at York-road, Camden Town on Monday. They have been built from plans prepared in the office of the architect to the London School Board, and will accommodate 600 scholars; but a wing is in course of erection which will provide room for another 400. The cost, including purchase of site, has been £15 16s. 10d. per head.

The second annual meeting of the City Church and Churchyard Society was held yesterday (Thursday) afternoon at the Mansion House.

Memorial-stones of a new Wesleyan chapel were laid at Norton, near Worcester, on Friday. The chapel is to seat 130 persons, and is being built by Mr. Patrick, of Bath-road, Worcester.

The restoration of the old parish-church of St. Mary, Monmouth, has just been commenced. The architect is Mr. G. E. Street, R.A., and the contractors are Messrs. Wall and Hook, of Brimscombe.

At St. John the Evangelist church, Wall, Lichfield, a new carved reredos, designed by Messrs. Jones and Willis, of Birmingham and London, has just been erected. It is constructed of Bath stone, with polished Irish marble shafts and panels. The design is Perpendicular, in harmony with the church.

A first-class award has been given at the Melbourne Exhibition to Craven, Dunnill and Co. (Limited), Jackfield Works, Ironbridge, Shropshire, for their exhibits of tiles, encaustic, geometrical, and decorated. Last year, at Sydney, the same firm had two awards, a first class and a first class special.

The thirteenth annual convention of the American Society of Civil Engineers began at Montreal on the 15th inst. A preliminary meeting was held at the Falls of Niagara on the 11th inst., when a paper on "The Suspension Bridge," by L. L. Buck, A.S.C.E., engineer in charge of the work, was read.

At a joint meeting of the Council and Trustees of the Town and Alms Lands Charities of Great Torrington, held on Thursday last, Mr. W. C. Medland was unanimously elected surveyor to the said trustees at a salary of £20 a year.

Mr. Simmonds, the head master of the Derby school of art, has resigned his appointment, having obtained a better post at the Glasgow school of art. At the same time, Mr. J. T. Cook, the second master of the Derby school, has been unanimously elected head master of the Sheffield school of art, in the place of Mr. Bradley, of Hanley, whose recent appointment to Sheffield has fallen through.

Intercommunication.

QUESTIONS.

[6546.]—**Mirror.**—In a large mirror which I have had fixed above a chimney piece, the wood finishing round doors and windows in same room, when viewed from different standpoints, appear as if curved and twisted. Will some reader kindly state the cause and remedy and oblige —ENQUIRER.

[6547.]—**Measuring Up.**—What can I legally charge for measuring up work as executed for the purpose of making up a final account? I am engaged by a contractor to test the accuracy of the original quantities which he asserts he has exceeded, and am anxious to charge him that to which I am fairly entitled.—TAKER OFF.

[6548.]—**Removing Dead White Appearance from Marble.**—Is there any stain or acid that can be used to take away the dead white of white marble? I have a white marble chimneypiece against a deep red paper, and cannot have a new chimneypiece, and do not like to paint. I should like to get a sunnier tone. Perhaps some of your readers can suggest some means.—F. S. A.

[6549.]—**Portland Cement Mouldings and Flat Surfaces.**—I shall be thankful if some experienced and obliging correspondent will kindly say the best mode of treating mouldings and flat surfaces made in Portland, so as to avoid the objectionable appearance of being painted, and how long should the work be done before the treatment is applied?—STONE FINISH.

[5550.]—**Egg-Shell Polish.**—How can I make this? It is, I believe, a good preparation for antique furniture. Also, what is "dry shining," used principally, I have heard, in the United States for black walnut?—POLISHER.

REPLIES.

[6505.]—**Zincwork.**—In answer to the query of "R.," I would call his attention to the following extract of Prof. Corfield's speech closing Mr. Hellyer's lecture on Plumbing at the Society of Arts room on the 14th inst. and reported in the BUILDING NEWS of June 17 at page 703:—"At the Parkes Museum they had a far worse case, in which the fittings were all of zinc, and were connected with an iron pipe. Of course, the zinc became rotten, and sore throats occurred in the house, but typhoid fever did not break out, simply because no person having that disease had visited the house; had the germs of typhoid been introduced it must have affected all in such a dwelling." I did not answer this before, not being quite certain that I would have been right in totally condemning zinc for such a purpose. It is well known by students of chemistry that zinc is speedily decomposed by acids, and is used in experiments for making hydrogen gas by its decomposition caused by dilute sulphuric acid. It is often the case that lead soil-pipes are found corroded, sometimes having large holes therein; this being so if any substitute were used instead of lead it should be of a better material and not a worse, for though the gas that ascends in a ventilating pipe may not act so strongly as in a soil-pipe, still it is the same thing and acts in as sure though it may be in a slower manner.—HUGH MCLACHLAN.

[6511.]—**Canada.**—It is true that there will be a number of villages built along the new Canadian railroad, but they will not be of such a nature as to need many architects. Ninety per cent., perhaps 99 per cent., of the houses will be of wood, and the "plenty of building" will scarcely serve your purpose. But, on the other hand, there is a great deal of architectural work done here and in Canada, though there is a crowd of architects to do it. While there is no employment that does not appear to be well supplied with workers, yet there is always room for good men at any kind of work. The only advice possible is plainly, Come out and do what turns up.—R. M. TUTTLE, Titusville, Penn., U.S.A.

[6522.]—**Bronze in London.**—"G. H. G." is right. I have read that the bas-reliefs at the base of the Nelson Column showed signs of corrosion before the lions, and I have seen the marks and pin-holes quite plainly on the latter. Even the lamps on London-bridge, instanced by "A. McG." show the effects of corrosion quite strongly in some places, the pinholes running into each other; what has to be noted is, that in some places the effect of corrosion is strongly marked, whilst in others there is no sign thereof, and it is evidently not because those parts corroded are more exposed than the others. It is further to be added, that the air on London-bridge is purer than in the town itself owing both to the wide expanse free from buildings, and the breeze which often blows strongly up the river.—HUGH MCLACHLAN.

[6523.]—**Warehouse Construction.**—Floors in concrete supported by iron have the advantage of being for practical purposes fireproof, especially if all the ironwork is covered with concrete, plaster or terra cotta. If the iron is exposed to a strong fire, this advantage is much reduced, as cast iron will crack and snap asunder when water is thrown on it, if strongly heated, and wrought iron will lose much of its strength and bend under the superincumbent weight. It does not matter when only the soffits of the iron girders or joists are exposed as the fire can not then play around the material, and has only a small surface to action. Three systems of fire-proof flooring are much used, the Dennett system, Fox and Barrett system, and Homan's fire-proof flooring. Of these I believe Homan's is the cheapest and Dennett's the most expensive, the advantages of the latter however are that less iron is used and that the concrete is made of sulphate of lime, which would bear a greater heat without injury than other concrete. The cost of the cheapest fireproof flooring over ordinary wood flooring is from 15 per cent. upwards. Capt. Shaw holds that extra stout timbers are practically more fireproof than exposed iron-work, since the fire chars the surface of the wood to a slight depth and this charred surface then acts as a protection to the unburnt wood inside, being of small heat-conducting power and uninflammable. If the scantlings of the timber work are increased for this reason, the cost will approximate that for ordinary fireproof flooring.—HUGH MCLACHLAN.

[6524.]—**Damp Wall.**—Wherefore attempt to stop the damp on the inside of the wall? In that case the brick-

work would at times become saturated, if the bricks are very porous, and then by repeated wetting and drying with the action of frost, the walls would gradually become disintegrated. See queries and replies, Nos. 6439 and 6495.—HUGH MCLACHLAN.

[6525.]—**Clays, &c.**—"S. F. C." will obtain some valuable information from a series of weekly articles in the BUILDING NEWS on "White bricks," commencing Sept. 11, 1874, and concluding on Oct. 9 following.—HUGH MCLACHLAN.

[6527.]—**Charges for Sketches.**—If "A Young Beginner" has started in business for himself he can charge the usual commissions or by time. See reply to No. 6512. If not, he had better take what he can get.—HUGH MCLACHLAN.

[6528.]—**Levelling.**—The advantages of "Tweedie" setting the staff "on" or "to" the bench mark are that all new levels may be calculated to the ordnance level and that if he finish with another bench-mark B.M., he can obtain a check to the correctness of his work. The three feet can be easily deducted when working out for the commencement of the surface line, or the bench-mark may be disregarded.—HUGH MCLACHLAN.

[6530.]—**Ink-Stains on Marble.**—Try the following recipe from "Enquire Within": "Marble may be cleaned by mixing up a quantity of the strongest soap lees with quick lime to the consistence of milk [cream], and laying it on the marble for 24 hours; clean it afterwards with soap and water." I believe this to be the same as that used by marble-dealers, having seen their preparation laid on several times, and been told their recipe. A few additions and an alteration should be made to that from the book named. The word "milk" is decidedly wrong, it should be "a thick cream," further the preparation is laid on if necessary for two or three days, and a second application is laid on if the marble is very dirty. In removing ink-stains by this method, it would be better to cover all the exposed marble-work, as the part cleaned would look so different to the remainder of the work if otherwise done. At the finish a slight mark of the stain may still be left.—HUGH MCLACHLAN.

[6531.]—**Party-Wall.**—If the eaves belonging to the said neighbour have projected over your client's property for the last twenty years, it is an easement, or if the land of both client and neighbour originally belonged to the same owner, who allowed the neighbour's house to be built in that manner, it is an implied grant, in neither case can you interfere without permission. If not cut off the eaves and do what you like with the party-wall, after having given proper notice. As to the gutter it must be left to the neighbour, who however has no right to allow the water from his property to run on your client's except under the two conditions above named.—HUGH MCLACHLAN.

[6532.]—**Shop-Fronts.**—The following titles have appeared in Batsford's catalogue: "Shop Fronts, of a Plain and Elaborate Character," by J. B. Robinson, architect, 25 plates, small folio, price £1 1s.; "Shop Fronts and Facades," by Victor Delasaux and John Elliott, architects, 22 plates, small folio, price 10s. 6d., Weale; "Studies in Mercantile Architecture," by W. S. Ogden, architect, 50 designs, small folio, price 30s. I have personally no acquaintance with any one of these works.—HUGH MCLACHLAN.

[An article on this subject will be found on another page.—ED.]

[6532.]—**Shop-Fronts.**—Mr. J. B. Robinson, sculptor, Derwent-street, of this town, publishes a very good book of shop-fronts, price £1 1s., which I think would suit "Mowbray Vale."—J. H. SMITH, Derby.

[6533.]—**Suffolk Bricks.**—"A Ten Years' Subscriber" can learn what he requires during the progress of any building by watching a bricklayer at his work. The frog would not have a different position in a Suffolk brick than it would have in a common stock brick. The best white Suffolk bricks are perforated and have no frogs.—HUGH MCLACHLAN.

[6534.]—**Cleaning Whitewash from Portland Stone.**—If "Telum" has any church restoration in hand, let him take particular pains that the stone be not redressed; also if the building be Mediæval, that care be taken to ascertain if there be any wall paintings under the whitewash. I found the following in the BUILDING NEWS of Sept. 12, 1873, recommended by the late Rev. Mackenzie Walcott. "I have found a weak solution of size delicately applied with a sponge, remove whitewash, even from the thickness of several coats, from distemper work or wall paintings, which coarse manipulation would effectually have destroyed." In a later number he explains the size to be used as isinglass reduced to a consistency sufficiently adhesive to remove flakes of whitewash. This should at first be used, and if it be found that there are no wall paintings and the stonework is reached, something stronger would be required to remove the coat of whitewash next the stone. The following may then be tried, from the BUILDING NEWS April 25, 1873: "Whitewash may readily be cleaned off by scrubbing with water and sand, being previously acidulated with about '04 of hydrochloric acid. The common acid will do, about 6d. per lb."—HUGH MCLACHLAN.

[6536.]—**Property of Architects' Design.**—See query and replies, No. 6438. I am not surprised at any architect being unwilling; it should be definitely settled that drawings of all works not carried out should remain the property of the designer, that no other person might afterwards either have the credit of his work, or what is worse, that the designer should have the discredit for details he never intended and would abominate. The following clause is from the "Schedule of Rules for Professional Practice and Charges," published and sanctioned by the R.I.B.A., 1872, and reissued June 12, 1878:—"In respect of the ownership of drawings and specifications, it has hitherto been the general custom for the architect to be paid for their use only, those documents remaining his property. N.B.—In case of sketches for works abandoned, this custom is recognised by the office of her Majesty's Works and Public Buildings. No authoritative decision in the courts of law has, however, as yet been given on the subject. It is therefore desirable, for the present at least, that the architect should have a distinct understanding with his employer on this point."—HUGH MCLACHLAN.

[6537.]—**Dry Rot.**—The rot results from want of ventilation, and the heat and moisture increased by acidulation during the fermentation. Make plentiful openings in the walls of beer-cellar and fix large terra-cotta air bricks. Iron would quickly rust from the moisture always to be found in such places. Let your timber be of well seasoned oak. Keep the tuns sufficiently apart that a man can pass between for purposes of inspection, and let a current of air drive through as much as possible from open doors, traps, or other openings. There are numerous preservatives against dry rot, but before using any of them, it is of the utmost importance that all woodwork be thoroughly clean and well seasoned. The following plans have been recommended: 1, twice wash all woodwork with hot lime whiting; 2, heat all surfaces of the woodwork and whilst it is in that condition rub in equal parts of linseed oil and tar well boiled together; also burnettising and kyanising. Whether any of these proceedings will improve the flavour of the beer in the tuns so treated in another question. See the BUILDING NEWS "Intercommunication" of Oct. 18, 1878, onthe same subject.—HUGH MCLACHLAN.

[6538.]—**Grates.**—According to circulars issued by Mr. D. O. Boyd, of Maddox-street, London, W., these grates are "The Hygiastic Ventilating School Grates," supplied and manufactured by himself.—HUGH MCLACHLAN.

[6540.]—**Foundations.**—There are several cases to be supposed in the question of right of support. First, supposing there are no buildings on either the land of your client or that of the adjoining owner the case is simple, for were your client to dig away or remove any of his land, thereby causing a part of that of the adjoining owner to fall in, the adjoining owner could recover damages for the support of his land by the land of your client is a "natural right of property." Second, supposing the adjoining owner had built on his own land more recently than ten years ago, if your client were at any time to dig away his own land by the side of the wall of the adjoining owner, thereby causing the wall to fall in, the adjoining owner could not recover damages since he has no right of support for his building. Third, in the last case, supposing your client were not only to dig away from the side of the wall, but also below it thereby causing not only the wall or the building to fall, but also part of the land of the adjoining owner below the building, the adjoining owner would recover damages for the land, but not for the building. An important question would I think arise as to the value of the land, and whether or not the value had been increased by the building thereon. Fourth, supposing the adjoining owner had built on his land for at least 20 years, the question arises as to whether or not he has an easement of right of support from the land of your client; as far as I can read formerly the judges would have held that there was an easement but, recently they appear to hold back from that view. If the definition of an easement given in "Gale on Easements" is agreed to the adjoining owner would certainly have acquired it. The definition is as follows: An easement may be a privilege without profit, which the owner of one neighbouring tenement hath of another existing in respect of their several tenements by which the servient owner is obliged to suffer or not to do something on his own land for the advantage of the dominant owner. In your case the "servient owner" would be your client, and the "dominant owner" the adjoining owner. The definition was accepted by the Court of Exchequer in the case of "Mounsey v. Ismay." Your correspondent will thus see that according to the difference of the case so the responsibility and cost of underpinning will shift from one to the other. Your solicitor understanding the case may probably be right. Read a paper read before the R.I.B.A. Dec. 17, 1877, "On the Law of Easements," by Mr. Locock Webb, Q.C., Hon. Associate, and the discussion thereon, held Jan. 7, following; also a paper read at the Institution of Surveyors on "The Law of Support as to Land and Buildings," Jan. 28, 1878, by Mr. J. Smalman Smith, which papers and discussion have been reported in the BUILDING NEWS and other professional journals. Cases have been cited.—HUGH MCLACHLAN.

[6540.]—**Foundations.**—The case of Kempston v. Butler, tried, re-tried, and finally settled by a Court of Appeal about 19 years ago, and no doubt to be found in the Irish reports, is held here to be an important and final ruling as to the common law and responsibility of adjoining owners. There being no local or special building statute bearing on it, litigation on this fruitful source of legal squabbles has practically ceased here since the decision referred to.—DUBLIN.

[6541.]—**Painter's Quantities.**—Window-sash squares each side separately at per dozen. Window frames to be numbered each side separately. Architraves per foot run. General painters' work at per yard super, including edges and projections; if it is necessary to work the brush in a line, as in the case of skirtings, &c., technically termed "cut in both edges," at per foot run. Hurst's "Architectural Surveyor's Handbook" gives the inside of sash frames to be taken with the linings at per foot super. Other work by number. I believe this plan to be generally followed. For Manchester, see the rules of the Manchester Society of Architects, published in the BUILDING NEWS of April 10, 1874.—HUGH MCLACHLAN.

[6542.]—**Spire Lights.**—Two plans can be adopted. I would recommend a flat-pitched roof covered with lead to be fixed inside at the base of the spire, with one or two pipes carried through the walls to carry off the rain. If the work were new, I would say, carry them through the gargoyles (if any) and make them serve their proper purpose. "N.E.R." is afraid of the sound of the bells being interfered with; the tendency of the roof would be to improve this, especially if a boarded ceiling be fixed below. Another plan would be to glaze the openings on the inside with obscured glass, though it would be objectionable at times, according to the direction and strength of the light.—HUGH M'LACHLAN.

[6543.]—**Church Building.**—1. See answers to 6509, all the blocks should be keyed together. In the fire at St. Mary's, Whitechapel, where was a wood block floor not keyed, it resulted, that the large quantities of water thrown in, floated the blocks out of their places; also by keying the blocks together, those sunken parts so often seen, are avoided. pressure being more equally distributed. As to cost, if the blocks are laid only 3in. in thickness, the expense would not be much higher than a 1½in. tongued floor with splayed headings. If, however, the thickness is increased, it becomes higher. 2. The pitch is too low for tiles, can you not raise it? Since a different material to the main roofs would be objectionable. 3. Use hot air, it is much cheaper than hot water, and quite if not more effective, it is certainly better than stoves in the body of the church. 4. The lighting conductor should be of solid copper tape, connected if possible to all external metal work, such as eaves, gutters, &c., it should be fixed to the building without insulators, and under ground, should be run into a cesspool, drain, bed of charcoal or made to branch out for a few feet in several directions over the ground 5. The finial should be of solid copper with several forks or branches and a platinum terminal at top, it should be about 5ft. high, and be connected to the tape conductor by a coupling connection, so that the finial and tape should be well in contact with each other. 6. The thickness of nave arcade is insufficient, if there is a clerestory, it should be at least 2ft. 3in. to have a decent appearance. Supposing however your wall to be only 18in. thick the nave 24ft. wide, and the stone for columns Darley Dale, then the diameter of the columns should be at least 15in. taking the safe load as 1-10 of the crushing weight. Should however the thickness of the wall be increased to 2ft. 3in., the diameter of the column need not be more for strength than 16½in., from the fact that half the weight to be carried is owing to the pressure of the wind, which of course does not increase with the thickness of the wall. Not knowing the crushing strength of Corngrit (Bath), I cannot say what should be the diameter of the columns in that material, I expect that though it is far stronger than Box Ground (Bath) still it is not so strong as Darley Dale. 7. For a pink stone for small shafts, use Red Mansfield or Corsehill (Dumfries) stone, or Isle of Mull or Peterhead granite. For a blue stone for the same, use slate or Aberdeen granite. HUGH MCLACHLAN.

[6544.]—**Weather Tiling.**—Your client is not different to many others, and if you let him have his own way, he will blame you in the future. The tiles can be fixed to the brick and woodwork without lathing, by a bedding of cement at the back, they had better have extra security on the woodwork by oak pegs driven through, as the cement will not hold on so well to the wood. If laths be used, it would I consider be necessary to project the quartering, for otherwise there would be no support for the pegs or nails. I would do without the brick nogging, should lathing be used, point in cement to keep out the weather, and use battening inside. Your proposed scantlings will do. The shrinking will not be enough to endanger the security of the work if bedded in cement and secured to the quarters.—HUGH MCLACHLAN.

PARLIAMENTARY NOTES.

ARTISANS' AND LABOURERS' DWELLINGS.—Dr. Tidy, medical officer for Islington, was examined on Monday before the Select Committee of the House of Commons engaged in considering the working of the Artisans' and Labourers' Dwellings Improvement Act. In reply to Sir Richard Cross, he stated that he had made three representations to the Metropolitan Board of Works for improvement schemes at Angel-court, Little Pierrepont-road, and Essex-road. In the Angel-court representation there were 78 houses affected, and a population of 504 people. The condition of the place had been exceedingly bad; in fact, the premises were almost falling to pieces. There was no possibility of dealing with the houses unless under an improvement scheme. He might have done something under Mr. Torrens's Act, but he preferred to submit a scheme to the Board of Works. There was practically no valuable property mentioned in the representation, and as for the population, it consisted principally of Irish costermongers and a large number of people who sold newspapers in the streets. Epidemic diseases in these parts were especially virulent. There was no special reason why the people should live there. At present three out of the seven courts were empty, and in the others notices that the people were to clear out within a certain period had been put up. These might be dealt with in several ways; but it seemed to him desirable that they should be dealt with, if possible, by a scheme, and, therefore, he made them the subject of a representation. The Essex-road scheme was a larger one, the number of the population affected being 1,052. Many of the houses in this case were in a very bad condition, and even before the scheme was proceeded with many of the houses were shut up by the magistrates. There were some model dwelling-houses in the district, in Peabody-square, and he had reason to believe that the death-rate in those houses was not much greater or much less than elsewhere in the neighbourhood. Other evidence was taken.

THE PROPOSED REMOVAL OF THE MINT.—At Tuesday's sitting of the Select Committee to whom the City Lands (Thames Embankment) Bill was referred by the House of Commons, Mr. Shaw-Lefevre in the chair, Mr. Wollaston Blake, of the firm of James Watt and Co., Birmingham—a director of the Bank of England—gave evidence in support of maintaining the Mint in its present site. He stated that the machinery was in excellent condition and capable of turning out twice as many coins as it now did. The only improvement required was the erection of two new engines and some adjusting rolling mills, and the building of an engine-house at the rear of the present rolling room. This could be done at an expense of £25,000, and with a stoppage of only four or five months, or on pressure of only three months. The Bank of England had now a stock of 16 millions

of sovereigns more than it ever had, and would not need to trouble the Mint for 12 months, and a store of silver coins could easily be accumulated at the Mint and at the Bank, for which the directors would give every accommodation. He saw no necessity for the removal of the site on the Thames Embankment, which would entail an expense of £480,000, of which £255,000 would have to be paid to the Corporation of London for the land, £45,000 for machinery, £50,000 for interest of money for four years before the old site could be disposed of and the new buildings erected, £15,000 for professional expenses, and £15,000 for contingencies. Deducting £180,000 for the old site would leave a net cost of £300,000, for which he saw no occasion. Mr. Bramwell, C.E, on the contrary, stated that none of the plans submitted to him were such as he could adopt, his dominant instruction from Government being that there must be no stoppage of the Mint. He thought no satisfactory alterations could be made at the present Mint without rebuilding it, which would take eighteen months or two years. Mr. Fremantle, deputy master of the Mint, stated that the present Mint had turned out 16 millions of pieces a quarter, but its usual output was 10 or 11 millions. There were twenty-six residences for officers at the present site, and would be only two at the new site, but an arrangement had been made by which no compensation would be given to officers who joined since 1869. The committee adjourned to Monday next.

WATER SUPPLY AND SANITARY MATTERS.

THE WATER SUPPLY OF NOTTINGHAM.—The Waterworks Committee of the town council of Nottingham have just published an account of the waterworks, and a report on their present condition, prepared by their engineer, Mr. Ogle Tarbotton. The works were formally transferred to the corporation by the directors of the late company on May 14th, 1830. The Parliamentary water district, which may be supplied, includes an area of 41,084 acres, or 64⅛ square miles; the population, according to the recent census, is 216,992, of whom about 191,753 are directly supplied with water from the Corporation works. The supplies are drawn from five sources, viz. (1) at Scotholme, New Basford, where underground springs are collected and conveyed by gravitation to the Castle pumping station, Nottingham; these waters issue from the lower Bunter beds of the New Red Sandstone formation, but are tainted by percolations from the river Leen. (2) The Trent Bridge Works were established in 1831, and are interesting as the first in this country to adopt the principle of constant high-pressure service; the supplies were drawn from gravel-beds adjoining the river; but, in consequence of the deterioration of the water, the works have been, for some years, disused. Mr. Tarbotton recommends the Corporation not to abandon the works, but points out that the site is becoming increasingly valuable for other purposes. (3) The Park, or Sion-hill works, were established in 1850, and consist of a small pumping station, deriving a supply of about 400,000 gals. per day of twelve hours, from wells sunk in the Bunter beds of the New Red Sandstone. The water is forced through a 12in. main, which extends to Belle Vue reservoir, but the draught on the main en route is so great, no water is actually delivered into the reservoir. The supply could be nearly doubled by pumping during the night. (4) The Bagthorpe Works, Basford, are the sheet anchor of the water supply. They are situate to the north of Nottingham Forest. The well, sunk in the Bunter beds, is most constant and prolific, and may be regarded as one of the most successful and wealthy sources of water-yield that the Triassic series of this country affords. There are three wells, each about 110ft. deep, and the total supply is from 2 to 2¼ million gallons per day, which could be increased from 2½ to 3 million gallons per day with the existing wells, engines, plant, and machinery. (5) The Bestwood Works are situate in Bestwood Park, about five miles from Nottingham, and were commenced in 1871. The water here is from the Bunter beds, and of remarkably pure and good quality. The supply is drawn from a depth of 176ft., and amounts to from 1½ to 1⅞ million gallons per day.—Efforts are being made to prevent waste by rules which, although stringent, are not oppressive, and these have resulted in a reduction of the amount of household supply. By means of electrical apparatus, the heights of the water in the reservoirs (which are situate at Belle Vue, Red Hill, Papplewick, Park-row, and Mapperly, and have a total capacity of nearly seven million gallons), are continuously recorded at the works and at the water office. In a summary, Mr. Tarbotton says the total supply from the Basford, Bestwood, and Park Works is, at present, 3,900,000 gallons, while it could be increased to 5¼ million gallons. The steady, and hitherto unprecedented, growth in the population, as shown by the late census, the persistent increase in the manufacturing resources of the neighbourhood, and demands made for more and better water by civilisation, will speedily involve serious consideration as to the sources and localities of future supplies. The existing resources will not satisfy the public much longer, while the seeking and bringing into action of new supplies are works of time, and cannot be done in a precipitate manner. Whether the wells now in use can be further developed, or whether a new well, sunk in some carefully selected spot north of, but remote from, Bestwood, should be the next step in advance, or whether some bolder scheme of enlargement, looking to the requirements of the future, would be the wisest policy, will shortly have to be settled. The engineer congratulates the Corporation and the public on the value of the water already secured, adding, "the deep New Red Sandstone wells of this part of England, in the conglomerate beds, produce water which cannot be surpassed for appearance, agreeableness, and wholesomeness; and it seems rational and economical to seek for further supplies in the vast and unbroken area of new red sandstone, which extends to the north and north-east of Nottingham."

IPSWICH.—The system of main sewerage works just completed for Ipswich was inaugurated on Wednesday week by a luncheon given by the contractors in one of the covered reservoirs at the outfall works, and by the unlocking of the valve of the reception-chamber, performed by the Mayor. The scheme has been devised by Mr. Peter Bruff, C.E., of Ipswich, who propounded the same plan in 1851, and consists of simply discharging the sewage by an outfall into the river Orwell, at Pilot's Hard, below Hog Highland—two miles below the dock. It consists of a main sewer, 4ft. by 4ft., inclosing the Gipping tail stream, and enlarged from Lower Orwell-street to the outfall to 5ft. by 5ft.; into this artery, which is 13,200ft., or 2½ miles, long, all the subsidiary sewers will be led. The contents, which will include storm-water, are to be held back for about 19 hours, and discharged into the river at two-thirds ebb, at 4ft. above low-water mark. Two open storm-water receptacles, the one holding a million the other 750,000 gallons, have been built in concrete, and two covered reservoirs, each 600,000 gallons capacity, are constructed and arched over in brickwork. In the execution of the works 130,000 cubic yards of earth were excavated, and 6,000,000 bricks (one-third of which were manufactured near the outfall works), and 3,000 tons of cement, supplied by Messrs. Patrick, Dovercourt, were used. The works have been carried out under the supervision of Mr. H. Miller, jun.; Messrs. S. Pearson and Sons, of Brownfield Works, Bradford, Yorks, were the contractors. The cost has been about £60,000, but a large sum for extras and timber left in the trenches has yet to be settled by arbitration.

LEGAL INTELLIGENCE.

A CONTRACTOR'S CLAIMS.—SUTHERLAND V. THE ABERDARE LOCAL BOARD OF HEALTH.—In the Queen's Bench Division on Saturday this case was tried before Baron Pollock and Mr. Justice Manisty. Mr. Green said the case came on appeal from the decision of the Lord Chief Justice, rescinding an order by Master Francis. The action was brought by a contractor, Sutherland, against the Aberdare local board of health, and the plaintiff claimed a sum of over £20,000. The action was commenced as far back as 1876, and at that time plaintiff sued both the local board and Mr. Bateman, the well-known civil engineer, who had been employed in that capacity by the local board, as to the construction of works included in a contract entered into between the plaintiff and the local board. The claim of the plaintiff against Mr. Bateman was for conspiracy and fraud on the part of Mr. Bateman, with the object of getting rid of certain certificates which had been given by Mr. Bateman as to work done under the contract. A large number of summonses were taken out for the purpose of compelling the plaintiff to state the particulars of his charges against Mr. Bateman, and ultimately an order was made by Master Dodson dismissing the case against Mr. Bateman, and allowing the plaintiff to amend his claim as against the local board. The plaintiff having delivered an amended statement of claim, the defendants endeavoured to obtain further particulars of plaintiff's charges, but had not succeeded in obtaining specific information as to which of the items were included in the contract as extras, and which of the items were entirely outside it. Their lordships dismissed the appeal with costs, upon the ground that the descriptions of the items were sufficiently explicit.

The annual meeting of the Kent Archæological Society will be held at Canterbury on July 27th and 28th. A paper will be read on recent discoveries of foundations, made at St. Augustine's College in that city, and an excursion will be made to places in the neighbourhood of Wingham.

Our Office Table.

PROF. BEILSTEIN, who has recently studied the various substances used for disinfection, arrives, in a communication made to the St. Petersburg Technical Society, at the following conclusions:—Sulphuric acid would be the best disinfectant if it did not destroy the sides of the tanks; the use of lime and of salts of lime ought to be completely renounced, as they but temporarily destroy bacteria, and under some circumstances may contribute to their development; nor does sulphate of iron, even in a solution of fifteen per cent., ultimately destroy bacteria, as they revive when put into a convenient medium. Therefore, Prof. Beilstein recommends sulphate of aluminum, which is used in paper and printed-cotton manufactures. The best means for providing it is to make a a mixture of red clay with four per cent. of sulphuric acid, and to add to this mixture some carbolic acid for destroying the smell of the matter which is to be disinfected.

AT the meeting of the Whitechapel District Board of Works on Tuesday, there was a discussion as to the large displacements of the population which have been caused by the improvements and clearances of the Metropolitan Board and the railway and dock companies. In Whitechapel alone the Metropolitan Board of Works have condemned areas housing 8,000 persons, half of whom have already been evicted. The remainder cling to the dwellings which, thus marked for removal, are fast falling into decay, and are without the commonest provisions for the preservation of decency and health. On a report to this effect being submitted by Mr. Isaac Battram, the local sanitary inspector, Mr. Barham, the member for Spitalfields, said that the most monstrous and indescribable overcrowding existed in his locality, and it was increasing. The Survey Committee had that morning seen spectacles of the way in which human beings lived which could not be mentioned to ears polite, and which far exceeded anything that realistic novelists had ever invented. And yet these wretched people, although herded like beasts, were compelled to pay enormous rents for the use of the dens and lairs in which they lived. Three shillings and sixpence for one "room" no larger than a fair-sized cupboard, and 5s. for two mere hutches were common charges. In many of these places there was no ventilation or light, and health, decency, and modesty were, of course, impossible. The Board ordered the report of the sanitary officer to be forwarded to the Metropolitan Board of Works.

ON Thursday week the 16th inst. the Architectural Association dinner was held at the Criterion, Piccadilly, the out-going president, Mr. Ernest C. Lee, in the chair. In responding to the toast of "Art," Mr. Stacy Marks, R.A., defended the present collection of paintings now exhibiting at the Royal Academy, and further urged that despite all the critics had said, the exhibition contained more really good honest examples of true painting than had been shown for several years, while the absence of any sensational pictures was to be regarded in the light of a considerable advantage. Mr. Marks spoke very highly of the architecture of the present day, and of architects; but he ridiculed critics and the criticism of the press. In conclusion, he defended the election as associate of Mr. G. Aitchison. Mr. Aston Webb, the newly-elected president of the Association, in replying to his toast, referred to the work of his coming year of office. He said: Though it would not be possible for him to signalise his presidentship by helping to found a travelling studentship as Mr. Lee had been enabled to do, he hoped that the work upon which they proposed to enter, for advancing the education of the student by advancing candidates in a preparatory way for the R.I.B.A. compulsory examinations, would not be unworthy of their greatest efforts, and he, as president, intended to do his best to further the movement.

THE *Illustrated London News* says: The will (dated Feb. 15, 1879), of Mr. William Burges, A.R.A., late of No. 9, Melbury-road, Kensington, architect, who died on April 20 last, was proved on the 23rd ult. by Richard Popplewell Pullan, Joseph Henry Christian, and John Starling Chapple, the executors, the personal

estate being sworn under £40,000. The testator leaves to the British Museum such manuscripts and antiquities as the authorities may select; to the Marquis and Marchioness of Bute such object of art designed by him as they may respectively select; upon trust for his clerk, Mr. J. S. Chapple, for life, and then for his wife for her life, £4,000; and legacies to pupils, clerks, and others. Two-thirds of the residue of his real and personal estate are to be held on trust for his sister, Mrs. Mary Leschallas Pullan, for life, and then for her husband for life; and, subject to such life interests, he gives the said residue to his nieces, Elizabeth Burges and Eleanor Burges.

MR. RICHARD BECKETT, of Hartford, Cheshire, is about to issue a "Provincial Builder's Price Book." His prospectus appears elsewhere, and we hope shortly to review the book itself. The idea is a good one, and if well-carried out is, in our opinion, sure to be a success. Builders and others have many times expressed their sense of a want of a *provincial* price-book, and the object Mr. Beckett has in view in the preparation of his book—viz., greater uniformity in the measurement of work and the pricing of it out—must commend it to every architect and builder.

THE committee of the International Medical and Sanitary Exhibition are sparing no pains to promote the success of this exhibition, and to judge from the admirable plans which have been issued to exhibitors, the collection of medical and sanitary appliances, to be opened under the auspices of the Parkes Museum of Hygiene, at South Kensington, on July 16th, will be of national importance. In connection with the exhibition, the Board of Trade issued the following certificate on June 21st:—"The Board of Trade, by virtue and in exercise of the powers conferred upon them by the Protection of Inventions Act, 1870, do hereby certify that the International Medical and Sanitary Exhibition, which it is proposed shall be held from the 16th of July to the 13th of August, 1881, both days inclusive, at South Kensington, in certain rooms, buildings, and galleries at the Royal Horticultural Society's Gardens, and the Royal Albert Hall, South Kensington, London, in the County of Middlesex, is in their judgment, calculated to promote British industry, and to prove beneficial to the industrious classes of Her Majesty's subjects.—Signed, by order of the Board of Trade, this 21st day of June, 1881, HENRY C. CALCRAFT, Assistant Secretary to the Board of Trade."

JUDGE MACKENZIE, of Toronto, has rendered a decision of some importance to the Canadian architects, and not without its bearing on the profession at home and elsewhere. The local statute allows an extra fee to a certain class of witnesses, but to the argument that architects ought to be included in this class he replied that architecture could not be considered a profession in the province, inasmuch as architects are not required to pass a government examination, are not organised by law, and are not recognised by statute. He added that he had in a previous case advised the architects to combine and seek incorporation.

THE 37th annual meeting of the Society for Improving the Condition of the Labouring Classes, was held on Wednesday afternoon at Willis's Rooms, the chair being occupied by the Earl of Shaftesbury, the president. The secretary read the annual report of the committee, from which it appeared that the houses of the Society are in good repair. The model lodging-house in Streatham-street, Bloomsbury, comprising 54 dwellings for families, had been fully occupied. Portpool-lane model houses, accommodating 20 families and 128 single women, had satisfactory occupation. The public washhouse in connection was reported as largely resorted to and much appreciated by the poor of the neighbourhood. The Dyott-street (late George-street), Bloomsbury, lodging-house for 104 single men returned an average of 92. That was owing to depression of trade and to so many being out of employment. Macklin-street (late Charles-street), Drury-lane, lodging-house for 72 single men had averaged 70. The renovated dwellings in Wild-court, Drury-lane, consisting of 108 rooms, had been fully tenanted. Clark's-buildings, St. Giles's, for 78 families, returned a full tenancy. Tyndall's-buildings, Gray's-inn-road, for 87 families, and lodging-house for 36 single men, had had a full average tenancy. As to Great St. Andrew's-street, St. Giles's, renovated houses for families, they had been generally well occupied. The Society's annual summary of the deaths and their causes placed the rate of mortality throughout the houses at 20 per thousand. There had not been a single case of small-pox throughout the whole of the Society's property up to the present time. That showed the benefit of extreme sanitary measures. The secretary also read the cash account, from which it appeared that the receipts from all sources during the year amounted to £5,788 5s. 2½d., which, with a balance in hand at the beginning of the year, made a total of £6,417 5s. 7½d. The total expenditure amounted to £5,947, leaving a cash balance of £470.

THE following calculation with regard to lifts is given by a German civil engineer, Herr Freissler, as the result of numerous experiments. In a four-story house, with 15m. for the mean height of ascent, and 100 ascents and descents daily, a single up and down journey will cost, in a lift with gas-engine 1·5kr.; in a hydraulic lift with winding drum 3·6kr., and in a hydraulic piston lift 8·7kr. This corresponds to a ratio of 1 : 2·4 : 5·8. Considering that the numbers of persons to be conveyed are severally 4, 3, and 6, the ratio becomes 1 : 3 : 4. The cost of construction, for the hydraulic lift with winding drum is double, and for the hydraulic piston lift three times, that of the gas-motor system. This explains (Freissler says) why in America, where the use of lifts is so general, the hydraulic lifts are seldom constructed, notwithstanding certain advantages.

CHIPS.

A statue of St. Peter seated in the Papal chair was, last week, placed within the north entrance to the Catholic church, Lancaster. The statue is 6ft. in height, is carved in wood, and is from the studio of Signor Balmez, of Rome.

A vestry-meeting was held at St. Botolph's, Colchester, on Monday week, when plans prepared by Mr. E. J. Dampier, architect, of Colchester, were approved for the alteration of the church—a modern, pseudo-Norman, brick-and-slated edifice, built beside the ruins of St. Botolph's Priory.

Drainage works have just been completed in the district of Astwood-bank for the Alcester rural sanitary authority. Mr. Norton was the engineer, and Mr. Law the contractor; the cost has been £1,000.

A new graving-dock was opened at Hull on Thursday week. It has been constructed at the west end of the Sir William Wright dock, by the Hull Dock Company, at a cost of about £80,000, and measures 500ft. in length from gate to head, and 85ft. wide at top; the locks are 50ft. wide and 450ft. long, and the depth of water in the sill is 21ft. at spring tides, and 15ft. at neap tides.

Colwall Church, near Worcester, a 13th-century edifice, was reopened on Wednesday week, after restoration and the addition of a north aisle. The aisle is separated from the nave by an arcade of Bromsgrove stone of five four-centred arches, supported on octagonal columns. Two of the windows have been filled with stained glass by Mr. Bond, of London; subjects, SS. Stephen and James the Great and SS. Peter and Paul. A gallery has been removed from the church, the old nave opened out, and the pulpit, dated 1638, which a few years since was taken from the church, has been replaced. Mr. J. T. Micklethwaite, F.S.A., of Great George-street, Westminster, was the architect, and Mr. T. Collins, of Tewkesbury, the contractor; the cost was £1,800.

New schools are about to be erected at Scorton, near Lancashire. Messrs. Paley and Austin are the architects of these, and also of enlargements about to be carried out at Christ Church schools, Lancaster.

On Friday week, a water-tank, which was being brought into use for the supply of Baddow and Springfield, suburbs of Chelmsford, burst, three of the sides giving way. The tank stands at Baddow, on a tower over 100ft. in height, and had a large water capacity. It had been built in ⅜in. plates by Messrs. Stanley, Hall, and Co., of London, the brickwork of tower being the work of Mr. Wood. The joint architects were Mr. Pertwee and Mr. Whitmore, both of Chelmsford. At the time of the accident, the tank was being filled, for the first time, by an 8 horse-power Otto engine from a spring close by.

Lamplough's Pyretic Saline is refreshing, most agreeable, and the preventive of FEVERS, BILIOUSNESS, SMALL POX, SKIN DISEASES, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill. *Use no substitute* —[ADVT.]

MEETINGS FOR THE ENSUING WEEK.

SATURDAY (TO-MORROW).—St. Paul's Ecclesiological Society. Visit to Churches of East Ham, Barking, and Rainham. Train from Fenchurch street, 2 7 p.m.

TUESDAY.—"The Science and Art of Sanitary Plumbing." By S. Stevens Hellyer. Lecture IV. "House Drainage and Ventilation." Society of Arts room. 7.30 p.m.

FRIDAY.—"The Science and Art of Sanitary Plumbing." By S. Stevens Hellyer. Re-delivery of Lecture IV. Society of Arts room 7.30 p.m.

Holloway's Ointment and Pills exercise priceless power over lumbago, all pains of the muscles, nerves, and joints, and quickly reduce all swellings caused by accidental injuries, weakness, or hereditary taints. The intelligible instructions enveloping Holloway's medicine give full counsel for using it most advantageously for regaining health, strength, and mobility.

Trade News.

WAGES MOVEMENTS.

OLDHAM.—The painters of this town, who recently struck for an advance in wages of ½d. per hour, have returned to work upon the old terms.

McLACHLAN & SONS, 35, St. James's street, S.W. Builders, Decorators, and House Painters. Designs and Estimates. General Repairs and Alterations Executed. Experienced Workmen always in readiness, and sent to any part of the country.—[ADVT.]

Doulting Freestone and Ham Hill Stone of best quality. Prices, delivered at any part of the United Kingdom, given on application to CHARLES TRASK, Norton-sub-Hamdon, Ilminster, Somerset. —[ADVT.]

BATH STONE.
BOX GROUND,
THE BEST FOR ALL EXTERNAL USE.
CORSHAM DOWN
CANNOT BE SURPASSED IN BEAUTY OF APPEARANCE FOR INTERIOR WORK.
PICTOR & SONS, BOX, WILTS.
(See trade advt. on p. XXXVII.) [ADVT.]

TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender—it adds to the value of the information.

BRENTFORD.—For new bank at Brentford. Mr. H. S. Legg, Christ's Hospital, architect:—

	Bank.	Fittings.	Total.
Adamson and Sons ...	£2,833	£115	£2,948
Brown, W.	2,700	120	2,820
Kearly, C. F.	2,630	142	2,772
Taylor, F.	2,502	99	2,601
Nye, T.	2,522	98	2,620
Hansom, A. B.	2,490	110	2,600
Beauchamp, T.	2,497	80	2,577
Gibson, G.	2,455	90	2,545
Brunsden, T.	2,418	115	2,533

BROMLEY, KENT.—For erecting residence, for Mr. R. W. Perkins. Mr. G. Sherrin, architect. Quantities by Mr. C. E. Blomfield:—

Greenwood, J. and J.	£3,970	0	0
Balding	3,861	0	0
McLachlan and Sons	3,789	0	0
Payne	3,770	0	0
Crossley	3,744	0	0
Grover	3,743	0	0
Roberts Bros....	3,708	0	0
Falkner	3,696	0	0
Syme and Duncan	3,658	0	0
Jerrard (accepted)	3,423	0	0

CAERLEON.—For enlarging the boys' department of Williams's Charity School:—

Jenkins, T., Caerleon (accepted) ...	£115	0	0

CROYDON.—For the enlargement of the hall and other additions to the Royal Masonic Benevolent Institution, Croydon. Mr. R. Griggs, architect:—

Kerry, E.	£1,400	0	0
Linzell, J.	1,286	0	0
Taylor, M.	1,227	0	0
Holliday, J.	1,147	0	0
Anley, J. (accepted)	1,092	0	0

ECKINGTON, DERBYSHIRE.—For alterations to roads at Eckington, for the highway board:—

Morton, W. R.	£108	3	6
Fanshawe, J.	74	0	0
Taylor, H....	71	3	3
Hollingworth	70	0	0
Lister, J.	62	11	6
Stevenson, J. (accepted)	62	4	0

GADDESDEN, HERTS.—For new farm buildings at the Wood Farm, for Mr. T. F. Halsey, M.P. Messrs. Sedgwick, Son, and Weall, Watford, architects:—

	If roofs tiled.	If roofs slated.
Cook Bros., Berkhampstead	£1,330	Deduct £85
Sear, J., Hemel Hempstead	1,125	add 10s. per sq.
Miskin, C., St. Alban's ...	1,12)	Deduct £100
Turner, T., Watford* ..	997	Deduct £70

*Accepted.

GREAT THURLOW, SUFFOLK.—For repairs to cottages at Sowley Green Farm, the property of the Right Hon. W. H. Smith, M.P. Messrs. Sedgwick, Son, and Weall, of Watford, architects:—

Mason and Son, Haverhill (accepted)	£82 17 0
Cadge, Hartest	80 11 0

For various works at Sowley Green and Wadgells and Harlica Farms, the property of the Right Hon. W. H. Smith, M.P. Messrs. Sedgwick, Son, and Weall, of Watford, architects:—

Mason and Son, Haverhill (accepted) £140 0 0

GREAT WRATTING, SUFFOLK.—For new stables and open sheds, at Moor Pasture, the property of the Right Hon. W. H. Smith, M.P. Messrs. Sedgwick, Son, and Weall, of Watford, architects:—

Mason and Son, Haverhill (accepted) ... £543 0 0

GREAT WRATLING, SUFFOLK.—For new buildings at the Old Malting Yard, the property of the Right Hon. W. H. Smith, M.P. Messrs. Sedgwick, Son, and Weall, Watford, architects:—

Cadge, Hartest	£543 11 0
Mason and Son, Haverhill (accepted)	497 10 0

HALTWHISTLE.—For new lodge and approaches to Blenkinsopp Hall, for the trustees of the late Mr. E. Joicey. Mr. W. Glover, 16, Market-street, Newcastle-upon-Tyne, architect:—

Scott, W., Newcastle £2,419 16 7

KENTISH TOWN, N.W.—For the erection of five houses and shops in the Kentish Town-road, N.W., for Mr. W. W. B. Rodger, of Bagatelle, Greenock, N.B. Messrs. W. Wallace and Flockhart, architects. Quantities supplied by Mr. F. Thomson:—

White, E.	£4,940 0 0
Macey and Sons	4,915 0 0
Hunt, J. R.	4,622 0 0
Toms, E.	4,436 0 0
Robertson, P. S.	4,421 0 0
Dowsing and Sons	4,380 0 0

LEICESTER.—For erection of pavilion, and S. W. entrance lodge, together with gates and fencing, to the Abbey Park. Mr. J. Tait, architect:—

Bass	£2,319 16 9
Barnett	2,082 1 0
Hutchinson and Son	2,066 0 0
Gilbert and Pipes	2,039 10 0
Major	2,020 7 0
Elliott and Son	2,006 4 0
Jewsbury	2,000 0 0
Kellett, W. H.	1,958 15 0
Hewitt, H.	1,957 15 0
Stirk	1,950 7 9

LONDON.—For various repairs to houses at Kentish Town, N.W., for Mr. F. W. Rowney. Messrs. Ebbetts and Cobb, architects, Savoy House, 115, Strand, W.C., and at Colchester:—

Steel Bros. (accepted)	£144 7 6

LONDON.—For finishing houses at North Kensington, for Messrs. E. P. Landon and G. H. Tatham, in accordance with the original contract. Messrs. Ebbetts and Cobb, architects, Savoy House, 115, Strand, and at Colchester:—

Cowland Bros.	£347 0 0
Williamson, J.	280 0 0
Handover, T.	220 0 0
Langler and Penthlham	208 10 0
Steel Bros. (accepted)...	190 0 0

LONDON.—For rebuilding premises, Watling-street. Messrs. Ford and Hesketh, architects;—

Patman and Fotheringham ...	£2,508 0 0
Adamson, T. H. and Sons... ...	2,430 0 0
Simpson and Son	2,407 0 0
Conder, E.	2,364 0 0
Peto Bros.	2,348 0 0
Brass, W.	2,321 0 0
Lawrance, E.	2,297 0 0
Ashby Bros.	2,196 0 0
Perry and Co...	2,072 0 0
Scrivener and Co. (accepted) ...	1,898 0 0

MOUNTAIN ASH.—For erecting a wall at the Bush, for the local board. Mr. Jenkins, surveyor:—

Taylor, T., Mountain Ash (accepted).

[Lowest of five tenders.]

MARYLEBONE.—For the erection and completion of St. Christopher's Industrial Dwellings, Barrett's-court, Wigmore-street, W. Contract No. 2. Mr. E. Hoole, architect:—

Henry and Wallace	£8,150 0 0
Lathey Bros.	6,417 0 0
Yardley and Sons	6,180 0 0
Higgs, F.	5,525 0 0
Smith, W.	5,377 0 0
Holloway, J.	4,962 0 0
Harradine, S. (accepted)	4,511 0 0

NETTLEBED, OXON.—For alterations, additions, and improvements to school buildings, for the Nettlebed School Board. Messrs. Morris and Stallwood, Reading, architects:—

Walter, J.	£975 0 0
Clements, C.	959 0 0
Hardy	935 0 0
Holly and Butler	897 10 0
Architect's estimate	935 0 0

NEWPORT, MON.—For scavenging the town during a term of three years, for the town council:—

Avery and Watts	£1,747 0 0
Knight, J.	1,700 0 0
Small, S. (accepted)...	1,600 0 0

OBAN.—For the erection of the Oban Hills Hydropathic Sanatorium, Oban. Mr. J. Ford Mackenzie, Glasgow, architect and civil engineer. Quantities by the architect:—

For the whole of the works complete:—

Calderwood, A., Kilmarnock ...	£22,700 0 0
Stewart, A. and T., Glasgow ...	22,533 14 4
Menzies, W., Oban	21,452 0 0
McAlpine, R. and Co., Hamilton	19,041 11 5

For the excavator, mason, and brickwork:—

Calderwood, A., Kilmarnock ...	11,922 10 0
McCormack, J. and Co., Glasgow	11,732 10 6
Fraser, A. and Co., Perth ...	11,686 5 0
Stevenson, T. and Son, Glasgow	11,500 0 0
McAlpine, R. and Co., Hamilton*	9,450 18 0
Bolton, M., Glasgow	8,792 19 0

*Accepted.

For the carpenter and joiner work:—

Stevenson, S. and Co., Glasgow ...	7,000 0 0
Ross, G. and Co., Glasgow ...	6,724 10 0
Rome, J., Kilmarnock	6,472 0 0
McAlpine, R. and Co., Hamilton	5,885 5 7
Ferguson, L. and Son, Rothesay...	5,806 9 3
Clow, A., Glasgow	5,747 10 0
McCormack, J. and Co., Glasgow*	5,733 0 0

*Accepted.

For the slater and tile work:—

Kier, J. and Son, Irvine	£909 17 0
Laurie, G., Duntocher	831 18 0
Morrison and Son, Glasgow... ...	804 0 9
McAlpine and Co., Hamilton ...	800 9 7
McKay, T. J., Glasgow	773 0 6
Dobson, A., Edinburgh (accepted)	731 4 6

For the plumber work:—

Fairgrieve, A. and Sons, Greenock	1,438 6 11
Philip and Wallace, Glasgow ...	1,356 0 0
Rome, J., Kilmarnock	1,059 0 0
McAlpine, R. and Co., Hamilton	1,038 2 2
Drummond, P. and Sons, Moffatt	1,000 0 0
Easdale, R. M. and Co., Glasgow	977 1 0
Anderson, W., Glasgow (accepted)	970 0 0

For the plasterer work:—

Bremner, W., Junr., Glasgow ...	1,918 0 0
Ford Bros., Kilmarnock	1,391 0 0
Mowatt, D., Edinburgh	1,187 5 5
McAlpine, R. and Co., Hamilton*	1,113 14 11

*Accepted.

For the glazier work:—

McAlpine, R. and Co., Hamilton ...	545 9 5
McCulloch and Gow, Glasgow ...	504 18 8
Rae, G. and J., Glasgow	497 0 0
Rome, J., Kilmarnock	496 0 0
Meikle, W. and Son, Glasgow ...	464 9 9
Simpson, A. M., Glasgow (accepted)	460 0 0

For the painting and varnishing work:—

Simpson, A. T., Glasgow	230 0 0
McAlpine, R. and Co., Hamilton ...	207 11 9
Curdie, G., Kilmarnock	190 13 9
Cameron and Jamieson, Glasgow ...	169 7 8½
Brown, D. G. and Co., Glasgow* ...	166 16 6
McCulloch, H., Glasgow	163 16 10½

*Accepted.

PETROCKSTOWE, NEAR DEVON.—For erection of drying-lofts and sheds, for Messrs. G. and C. Adams, tanners and curriers:—

Handford and Sheppard	£157 0 0
Grant (accepted)	148 10 0

PORTMADOC.—For pile-driving, &c., required in extension of Ballast Bank, Portmadoc Harbour. Mr. T. Roberts, Assoc.M.Inst.C.E., engineer:—

Davies, Waunfawr	£812 0 0
Morris, Carnarvon	477 0 0
Pritchard, Portmadoc	430 0 0
Owen, Portmadoc	430 0 0
Hughes, Portmadoc	424 0 0
Greene, Portmadoc	423 0 0
Williams, Carnarvon	416 0 0

PORTSMOUTH.—For the erection of sailors' rest and adjoining shop in Commercial-road, Portsmouth, Hants, for Miss Weston and Miss Wintz. Messrs. Davis and Emanuel, architects. Quantities supplied by Mr. H. P. Foster:—

Roberts, R. H, Portsmouth	£5,285 0 0
Ward, W., Portsmouth	5,013 0 0
Light, W. R. and C., Portsmouth	4,690 0 0
Burbidge, G., Portsmouth. ...	4,555 0 0
Cooper, T. C., Portsmouth ...	4,180 0 0
Evans, H. and W., Portsmouth ...	4,100 0 0

RUISLIP, MIDDLESEX.—For repairs to Manor Farmhouse, for the Provost and Scholars of King's College, Cambridge. Messrs. Sedgwick, Son, and Weall, Watford, architects:—

Brown, Harefield (accepted) ...	£138 0 0

SCARBOROUGH.—For sewer in Alma square, for the town council:—

Bastiman, J. and Son (accepted) ...	£45 10 0

STARCH GREEN.—For alterations at the Orchard Tavern, Starch Green, Hammersmith, for Mr. Johnson. Mr. H. I. Newton, 27, Great George-street, S.W., architect:—

Gill	£657 0 0
Gibbs and Flew	544 0 0
Wood (accepted)	498 0 0
For new counter at the above:—	
Warne	126 0 0
Davidson...	123 0 0
Sanders (accepted)	107 0 0

ST. JOHN'S WOOD.—For decoration and repairs at villas, St. John's Wood and Hampstead. Mr. F. H. Culverhouse, surveyor;—

Grey	£199 19 0
Steed Bros.	178 0 0
Bangs, J. and H.	157 12 0
Bradbury	154 11 5

TORRINGTON, DEVON.—For alterations and additions to a dwelling-house and shop, for Mr. E. Barrett. Mr. W. C. Medland, architect:—

Grant	£147 0 0
Handford and Sheppard (accepted)	140 0 0

TORQUAY.—For building farmhouse and out-building on Cochington Estate, near Torquay. Messrs. J. W. Rowell and Son, architects. Quantities supplied:—

Drake, G., Torquay...	£1,356 0 0
Sanders and Sons, Torquay ...	1,159 0 0
Leaman, A. S., Torquay	1,076 6 0
Goss, W. A., Torquay	1,067 0 0
Vanstone and Munford, Torquay*	972 15 0

*Accepted.

TOTTENHAM.—For two semi-detached villas, Willoughby Park-road, Tottenham, N., for Mr. E. Ambler. Mr. C. H. Coalville Smith, 9, Hart-street, Bloomsbury, architect:—

Bell, J....	£1,375 0 0
Sharp and Everard	1,208 0 0
Jarvis and Sons	1,180 0 0
Bradford, F.	1,160 0 0
Reduced Estimate:—	
Bradford, F.	985 0 0
Jarvis and Sons (accepted) ...	975 0 0

WALTHAM.—For the sinking of artesian well at Waltham New Town, for the Cheshunt local board of health:—

Brown, W. H., Tottenham (accepted).

WATFORD.—For repairs to farm buildings at Waterdell farm, for the Rev. W. D. Morrice. Messrs. Sedgwick, Son, and Weall, Watford, architects;—

Neal, Watford	£420 0 0
Southcott, Highgate	377 0 0
Chadwick, Watford	343 0 0
Miskin, St. Alban's	280 0 0
Turner, Watford (accepted)... ...	280 0 0

[*For remainder of* TENDERS *see page* XXII.]

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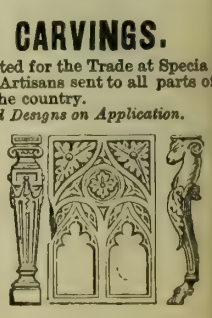

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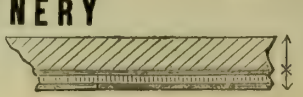

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